An Analysis of the Relationship between Insurance Risk Management and Growth of the Nigerian Economy

International Journal of Economics and Financial Modelling
Vol. 2, No. 1, 25-36, 2017

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ABSTRACT

This study sought to examine the causal relationship between insurance risk management and growth of Nigerian economy within the period, 1981 to 2011. The study employed the Ordinary Least Squares technique in addition to, Johansen co-integration, Granger causality test, Error Correction Model (ECM), impulse response function and variance decomposition statistical methods of estimations. On the short run relationship, the study observed the existence of positive relationship between insurance risk management proxied by insurance various claims payment and the growth of Nigerian economy except the claim payment on marine policy which related negatively with growth of Nigerian economy within the period. Also, the study revealed the existence of equilibrium relationship between our employed variables and our ECM, denoting that 11% deviation from the equilibrium can be corrected over a year. On the direction of causal relationship, the study found no bidirectional relationship between our employed variables, however, a unidirectional relationship was observed from CPF to GDP, GDP to CPA, GDP to CPM, and GDP to CPMA. From our impulse response function, it was observed that GDP responded positively to own shock both in the long and short run, while its response to shocks from other variables was mixed. We found from our variance decomposition estimate that own shock represents the greatest source of variations in the forecast error of observed variable (GDP). Based on these findings, the study recommends among others that: Effort should limit the level protocols required by insurance sectors in the case of indemnification.

Keywords: *Insurance, Economic growth, Risk, Gross domestic product, Nigeria.*

DOI: 10.20448/811.2.1.25.36
Citation | Nonso Fredrick Okoye; Obiamaka Egbo; Onuora M. Okeke; Ebele Nwankwo (2017). An Analysis of the Relationship between Insurance Risk Management and Growth of the Nigerian Economy. International Journal of Economics and Financial Modelling, 2(1): 25-36

Funding: This study received no specific financial support.
Competing Interests: The authors declare that they have no competing interests.
History: Received: 8 March 2017/ Revised: 2 June 2017/ Accepted: 6 June 2017/ Published: 8 June 2017
Publisher: Online Science Publishing

1. INTRODUCTION

The role of insurance sector in mitigating unexpected adverse outcomes in our day to day activities cannot be over emphasised both in developed and developing countries. This has made it an attractive area of interest for scholars in recent time. As a business of assembling resources together for the sole purpose of indemnification, insurance plays a vital role in the development and growth of any economy. According to Skipper (1997) "the fundamental aspect of insurance in promoting economic growth through its structured risk management process involves; identifying the exposures to accidental loss, evaluating alternative techniques for treating each loss exposure, and choosing the best alternative." This according to Oke (2012) permits organizations to focus their attention and capitals on their core businesses, leaving their risk to the worries of insurance firms and thereby contribute largely on the growth of the economy. Arising from the works of Haiss and Sumegi (2006) and Levine (2004) insurance contributes to the growth of an economy by means of its activities of risk transfer and indemnification which promote the financial stability of a firm. Similarly, Torbira and Ngerebo-A (2012) have argued that by reinstating the insured back to his pre-loss position, insurance sinks the aggregate risk and as such, accentuates the stock of existing capital in the economy. According to Dorfman (2005) risk management centres on rational development and execution of a plan targeted at potential unexpected adverse outcomes of business activities that will guarantee the management of individual's and organization's exposure to loss and to protect its investments. Nweke (2013) also holds the view that risk management role of insurance business stimulates economic growth of a nation by means of sinking investor's panic of loss.

Following the argument by most scholars, we can deduce that insurance activities especially in the area of risk management and loss indemnification can be a source of confidence to investors and as such, help in stimulating the growth of an economy. However, despite the demonstrated efficacy of risk management role of insurance companies in mitigation of losses as well as the adverse consequences that random shocks may have on capital investment in the economy as revealed in the works of Haiss and Sumegi (2006) and Levine (2004) more attention has been dedicated by researchers on banks and the development of several nations economy with little emphasis on non-banks financial institutions such as insurance. Based on this, insurance activity in Nigeria is still faced with little and uneven development especially in the area of non-life policy. This has led to high level of risk in economic undertakings by individuals and firms. Against this background, a study of insurance activities and growth of Nigerian economy with greater emphasis on risk management and loss indemnification becomes relevant.

This work is structured into five sections, beginning with section one which is the introduction. Section two reviews related literature. Section three dwells on the research methodology. Data are presented and analysed in chapter four while section five contains our concluding remarks and policy recommendations.

2. REVIEW OF RELATED LITERATURE

Insurance is often seen as an act of assembling funds from various insured entities in form of premium in order to protect them from risk exposures and guarantee them of indemnification in the occurrence of that which they have insured against. Dorfman (2005) opines that insurance business is a legal contract that manages the uncertainty of one party (the insured) through the transfer of a particular risk to another party (the insurer) who offers a restoration/indemnification of relatively large financial losses suffered by the insured. Oke (2012) stresses that the business of insurance is aimed at guaranteeing the financial security of individuals, corporations or other entities in case of unanticipated loss. Summarizing the view of Ajayi (2000) insurance could be seen as an undertaking of repayment by the insurer to the insured in case of the occurrence of a specified loss.

Based on the forgoing, we can therefore deduce that the main essence of insurance is for indemnification; guided by the principle of indemnity that involves the act of placing the insured back to the financial or material position he was before the occurrence of the loss. According to Ward and Zurburegg (2000) "without access to product liability insurance, firms, particularly pharmaceuticals, would be unwilling to develop and market highly beneficial products". This implies that apart from creating risk management awareness in the decision making of individuals, firms, governments, etc., insurance helps in building a stable and favourable business environment in an economy and as such influences their investment decisions.

From the foregoing, t it is imperative that an economy, deprived of effective insurance practice, will be performing far below expectation. However, even with this indispensable role of insurance risk management in boasting the growth of an economy, insurance business in Nigeria is still operating far below the expectation. This is evidenced in the high rate of poverty in the country, school dropout of children, early marriages, among others; all mainly as a result of death of a family *bread winner*. It is against this background that that this study was carried out. It is envisioned to aid policy makers on best ways to harness the risk management function of insurance to the advantage of economic growth of Nigeria.

2.1. Theoretical Framework

Many theories and empirical findings on the link between insurance activities and growth of an economy exist. For instance, Merton and Bodie (1995) developed a modern theory of financial intermediation that encompasses both the traditional theory and financial environmental changes. The theory highlights six main roles of insurance to include but not limited to: facilitation of exchange of goods and services through establishment of means for clearing and settling payments; creation of device for gathering resources; allocation of scarce resources; management of risk; provision of price information and creation of means to tackle the problem of moral hazard, physical hazard and information asymmetry. For the purpose of this study, our emphases will be on risk management function of insurance firms. According to Dorfman (2005) "risk management is the logical development and carrying out of a plan to deal with potential losses in order to manage individual's and organization's exposure to loss and to protect its assets."

However, in the opinion of Torbira and Ngerebo-A (2012) risk management could be viewed from three basic dimensions: traditional, financial or holistic risk management. While traditional risk management deals with the management of problems related to pure risk, financial risk management is devoted to solving or mitigating against losses arising from macroeconomic instability such as interest rate changes, exchange rate variations, or price instability; and holistic risk management which can be referred to as enterprise risk management , seen as a design that concurrently considers all kinds of risk whether pure or speculative that is capable of generating losses to individuals, organisations and or governments.

2.2. Empirical Review

Beenstock *et al.* (1988) studied the effect of premiums for property liability insurance on gross domestic product, income and interest rate covering 12 countries over the period, 1970 to 1981. Employing the OLS method of estimation, they revealed the existence of correlation between interest rate and gross national product, income and interest rate; and also that marginal propensity to insure rises with income per capita at short and long run although higher at long run. Browne and Kim (1993) examined life insurance consumption per capita for 45 countries over the years, 1980 to1987, using multiple regression analysis, and found that there exists a positive

correlation between income, income dependency, and social security expenses, while inflation is negatively correlated and significant in both years.

Peter and Kjell (2006) examined the link between insurance and growth of an economy over the years, 1992 to 2004, covering 29 European countries. Using various methods of analysis, they observed that there is a feeble evidence for a growth-supporting function of life insurance. Again, Arena (2008) used generalized method of moment for dynamic models to analyse the relationship between insurance market activities and economic growth of both developed and developing countries, sampling 56 countries over the period, 1976 to 2004. The outcome of the study revealed a positive and substantial influence of total life and non-life insurance market activities on growth of an economy. Also, Applying a cross country panel data on 29 European nations, Haiss and Sumegi (2006) examined the association between insurance companies and the growth of European economy over the years, 1992 to 2005. Engaging the OLS and time fixed effects methods of analysis, they found that life insurance impacts positively on 15 European nations; while non-life insurance impacts largely on the economies of Central and Eastern Europe. With the use of co-integration and fixed effects model, Oke (2012) analysed the short and long run relationship between insurance growth and development and the growth of Nigerian economy over the years, 1986 to 2009. The findings revealed that the growth and development insurance sector significantly and positively impact on the growth of Nigerian economy. On the directional relationship, the result of granger causality test showed a limited and no-direct effect of insurance sector development and growth on the economic growth of Nigeria. Wadlamannati (2008) studied the effects of insurance growth and reforms on economic development in India over the years, 1980 to 2006. Employing the OLS, co-integration, and ECM methods of estimation, the study revealed that insurance sector reforms do not affect economic growth; however, insurance sector growth was found to exert positive impact on the growth of the Indian economy.

Marijuana *et al.* (2009) studied the relationship between insurance sector development and the growth of the economy of 10 European Union member countries covering the period, 1999 m to 2007. Their study revealed that insurance sector development significantly and positively impacts economic growth.

Webb *et al.* (2002) studied the causal relationship between banks, life, and non-life insurance activities on the growth of an economy based on the framework of the reviewed Solow-Swan neoclassical model of economic growth. Their findings showed that the exogenous components of the banking and life insurance measures are found to be vigorously predictive of increased growth of economy.

3. MATERIALS AND METHODS

For clarity of purpose, this section is further divided into subsections as presented below:

3.1. Research Design

The study adopted the *ex post facto* design.

3.2. Data and Variables Description

Data used in this study are of time series nature. They were data on insurance various claims payment comprising of Claim payment on fire policies, Claim payment on accidents policies, Claim payment on motor vehicles, Claim payment on employers liabilities, and Claim payment on marine policies and GDP over the years 1981 to 2011 as presented in table 1 below. However, the study would have expanded the years up to 2014 but the absence of data on various claims beyond 2011 proved the effort abortive.

Table-1. Variable Representation

Year	GDP	CPF	CPA	CPM	CPE	CPMA
1981	94.33	6.3	3.7	47.0	1.3	10.0
1982	101.01	6.8	5.5	44.7	1.5	10.4
1983	110.06	6.0	5.6	55.6	1.2	5.4
1984	116.27	5.3	6.3	53.7	1.2	8.0
1985	134.59	(0.0)	6.4	54.2	0.9	(0.0)
1986	134.6	6.9	5.9	54.2	0.8	11.4
1987	193.13	16.4	8.4	55.6	8.0	3.3
1988	263.29	16.5	11.2	67.8	0.8	30.2
1989	382.26	47.0	28.8	73.1	2.0	110.0
1990	328.61	61.5	30.8	114.5	2.3	37.3
1991	545.67	80.4	42.8	164.8	5.6	58.0
1992	875.34	114.8	66.8	267.4	8.3	81.2
1993	1,089.68	1,161.0	448.7	607.3	12.8	119.5
1994	1,399.70	267.4	193.8	605.2	22.0	132.4
1995	2,907.36	194.5	207.1	563.6	9.6	184.4
1996	4,032.30	342.7	276.9	712.3	54.5	191.8
1997	4,189.25	349.1	376.6	780.9	42.0	106.1
1998	3,989.45	388.1	396.7	832.9	39.8	129.5
1999	4,679.21	891.0	1,649.0	1,824.7	93.8	1,068.9
2000	6,713.57	1,107.7	806.3	1,804.2	112.4	440.8
2001	6,895.20	1,164.7	957.8	2,315.9	132.4	790.7
2002	7,795.76	1,857.9	109.3	2,818.7	110.8	900.9
2003	9,913.52	1,681.7	2,266.8	3,040.2	126.8	1,240.6
2004	11,411.07	2,724.4	2,852.9	3,476.2	189.5	1,361.4
2005	14,610.88	2,766.7	3,138.2	3,733.4	153.6	1,266.2
2006	18,564.59	6,663.0	15,239.8	20,735.0	912.7	10,493.4
2007	20,657.32	1,793.4	3,829.1	6,196.1	207.5	1,904.2
2008	24,296.33	6,076.6	4,467.5	9,935.5	319.2	3,185.0
2009	24,794.24	15,124.7	6,567.5	13,040.3	337.4	4,556.6
2010	33,984.75	7,794.1	6,444.5	13,219.0	281.0	2,965.2
2011	37,409.86	8,520.5	6,820.6	13,205.6	271.1	2,889.6

Source: CBN statistical bulletin (Various years)

3.3. Model Specification

This study modelled economic growth as a positive function of insurance risk management capturing their various claims payment, the study specify in functional form thus:

$$GDP = f(CPF, CPA, CPM, CPE, CPMA,) \text{ ---------- } (1)$$

Where:

CPF = Claim payment on fire policies,

CPA = Claim payment on accidents policies,

CPM = Claim payment on motor vehicles,

CPE = Claim payment on employers liabilities, and

CPMA = Claim payment on marine policies.

Econometrically, we have;

$$GDP = \beta o + \beta 1\ CPF + \beta 2\ CPA + \beta 3 CPM + \beta 4 CPE + \beta 5 CPMA + \mu i \text{--------} (2)$$

Where:

β_o = Constant,

β_1-β_5 - = Estimation parameters, and

μ = Error term.

We specify 2.in log-form as -

$$LGDP = \beta o + \beta 1\ LCPF + \beta 2\ LCPA + \beta 3\ LCPM + \beta 4\ LCPE + \beta 5 LCPMA + \mu i \text{ ------ } (3)$$

Our A-*a priori* expectation with respect to equation 2 are -

$\beta 1, \beta 2, \beta 3, \beta 4, \beta 5 > 0$

For the purpose of detecting the presence or otherwise of unit root which is a pre-test for co-integration, we employed the Philp-Peron test statistics as -

$$Y_t = \alpha + py_{i-1} + \varepsilon^t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

Where:

Y = variable of choice.

α_0 = intercept.

ε^t = white noise error term.

Following from this, the hypothesis to be tested becomes-:

Ho: □ = 0, the time series data is non-stationary.

H1: □ ≠ 0, the time series data is stationary

3.4. Error Correction Model

After establishing the existence of co-integration among our employed variables, ECM was used to ascertain the speed of adjustment and the model is presented thus:

$$GDP_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} GDP_{t-1} + \sum_{i=1}^{n} \alpha_{2i}\ CPF_{t-1} + \sum_{i=1}^{n} \alpha_{3i} CPA_{t-1} + \sum_{i=1}^{n} \alpha_{4i} CPM_{t-1} + \sum_{i=1}^{n} \alpha_{5i} CPE_{t-1} + \sum_{i=1}^{n} \alpha_{6i} CPMA_{t-1} + \delta_1 ECM_{t-1} + \mu t \quad \ldots\ldots\ldots (5)$$

3.5. Granger Causality

The causal relationship between GDP and our independent variables (insurance claims payment) is expressed as:

$$Y_t = \alpha_1 + \sum_{i=1}^{m} \alpha_{2i} Y_{t-1} + \sum_{i=1}^{m} \alpha_{3i}\ X_{t-1} + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

$$X_t = \beta_1 + \sum_{i=1}^{m} \beta_{2i} Y_{t-1} + \sum_{i=1}^{m} \beta_{3i}\ X_{t-1} + \mu \ldots\ldots\ldots\ldots\ldots (7)$$

From the model, X_t is said to granger cause Y_t as long as α_{3i} is ≠ 0; similarly, in the second model, Y_t is said to granger cause X_t as far as β_{2i} is ≠ 0. At the occurrence of the first scenario, the causation is said to be supply

leading, while the second is said to be demand following. However, if both are significant, the variables are said to have a bidirectional relationship.

3.6. Diagnostic Test

Breush-Godfrey Serial correlation LM test: This was used to check the serial order correlation or autocorrelation amid the successive error terms. Breush-pagan-Godfrey Heteroskedasticity test: this shall be used for the check of heteroskedasticity of data.

4. RESULT PRESENTATION AND ANALYSIS

Results of our tests are presented in tables as shown below.

Table-2. Philip perron stationary result

Variables	PP-statistics	Critical value	Order of integration
GDP	-2.623271 (0.0106)	5% level -1.952910	stationary at first diff *I*(1)
CPF	-8.102115 (0.0000)	5% level -1.952910	stationary at first diff *I*(1)
CPA	–1.955706 (0.0497)	5% level -1.952473	stationary at level *I*(0)
CPM	-9.689682 (0.0000)	5% level -1.952910	stationary at first diff *I*(1)
CPE	-2.486525 (0.0148)	5% level -1.952473	stationary at level *I*(0)
CPMA	-3.129043 (0.0028)	5% level -1.952473	stationary at level *I*(0)

Source: author's computation

From table 2, the result of Philip perron statistics indicates that all the variables were stationary at first difference although not at the same order of integration. At 5%level for instance, only CPA, CPE, and CPMA proved to be stationary, while at the first differencing, GDP, CPF, and CPM became stationary. Therefore, having proved the stationarity of the data which stands as a pre-test for co-integration, we proceeded to other econometric analysis.

4.1. Diagnostic Tests

Table-3. Heteroskedasticity test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.160867	Prob. F(5,25)	0.3557
Obs*R-squared	5.841203	Prob. Chi-Square(5)	0.3220
Scaled explained SS	5.249895	Prob. Chi-Square(5)	0.3862
Prob(F-statistic)	0.355723		

Source: Authors' computation

Based on the result of Breush-Pagan-Godfrey test of heteroskedasticity as depicted above, the recorded F-statistic and Observed R-square were 0.486523 and 3.210264? respectively, while the reported probabilities of 0.8142 and 0.7820 which are greater than the critical probability of 5% (0.05) level of significance and as such, implies that our data are not heteroskedastic which is a desirable result.

Table-4. Serial correlation test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.209379	Prob. F(2,23)	0.8126
Obs*R-squared	0.554319	Prob. Chi-Square(2)	0.7579

Source: Authors' computation

As shown in the table 4, the result of Breush-Godfrey serial correlation LM test with the F-statistics and Observed R-squared of 0.208541 and 0.515382 respectively, and probabilities of 0.8127 and 0.7728 which were all greater than the critical probabilities at conventional levels of significance (1%, 5%, and 10%) is an indication of an absence of serial correlation problem. Therefore, we accept the null hypothesis that the data are not serially correlated which confirm our Durbin Watson result.

4.2. OLS Result

The regression results are presented in table 5 as ahown below.

Table-5. Regression Result

Dependent Variable: GDP
Method: Least Squares
Date: 03/05/16 Time: 23:31
Sample: 1981 2011
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	539.4301	444.9323	1.212387	0.2367
CPF	0.571796	0.260912	2.191526	0.0379
CPA	1.492611	0.750393	1.989106	0.0577
CPM	3.036988	0.431481	7.038525	0.0000
CPE	60.07751	14.03822	4.279568	0.0002
CPMA	-11.89334	1.240861	-9.584752	0.0000
R-squared	0.975352	Mean dependent var		7826.232
Adjusted R-squared	0.970422	S.D. dependent var		10507.51
S.E. of regression	1807.093	Akaike info criterion		18.00881
Sum squared resid	81639632	Schwarz criterion		18.28636
Log likelihood	-273.1366	Hannan-Quinn criter		18.09929
F-statistic	197.8568	Durbin-Watson stat		2.098734
Prob(F-statistic)	0.000000			

Source: Authors' computation

4.3. Analysis

From table 5, our R^2 stood at 98% approximately indicates that over 98% variations in economic growth measured by GDP are being accounted for by our selected explanatory variables. This shows that risk management activities of insurance sector have a very high percentage influence on the growth of Nigerian economy. Interestingly, the observed Durbin Watson statistics of 2.09 is an indication that there is an absence of serial correlation and as such, the result is no spurious. Also, from the table, our observed F-statistics of 197.8568 with 0.000000 probability implies that at 5% critical level, our model demonstrated a good fit and as such, sufficiently captures insurance risk management and growth of Nigerian economy.

However, on the short run-relationship between our employed variables, the OLS result as depicted above shows that all our employed variables related positively and significantly with gross domestic product over the years of our study with the exception of claim payments on marine sector which proved to be negatively and significantly related with gross domestic product. The implication of this result is that risk management activities of insurance as captured by their various claims payment has been able to mitigate the adverse effect of economic losses and thereby contributing positively and significantly with economic growth except CPMA. Table 5 is relevant in this respect.

Table-6. Johansen co-integration Result

Date: 03/05/16 Time: 23:34
Sample (adjusted): 1983 2011
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: GDP CPF CPA CPM CPE CPMA
Lags interval (in first differences): 1 to 1
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.988245	302.7076	95.75366	0.0000
At most 1 *	0.933884	173.8471	69.81889	0.0000
At most 2 *	0.838495	95.07299	47.85613	0.0000
At most 3 *	0.667593	42.19955	29.79707	0.0012
At most 4	0.297389	10.25905	15.49471	0.2613
At most 5	0.000808	0.023427	3.841466	0.8783

Trace test indicates 4 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon *et al.* (1999) p-values

From the Johansen co-integration result obtained, our trace statistic indicates the existence of four co-integrating equations at 5% level of significance. This is evidenced on the probability values obtained which ranges from 0.0000 at none to 0.0012 at most three (3). Based on this, the study has proven the existence of long run or equilibrium relationship among our employed variables, and as such, it becomes imperative that we ascertain the speed at which any deviation at short run adjusts to the equilibrium using ECM. This is shown from our results in table 7.

Table-7. Result of Error Correction Model

Dependent Variable: D(GDP)
Method: Least Squares
Date: 03/07/16 Time: 08:32
Sample (adjusted): 1982 2011
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	664.7861	219.3092	3.031274	0.0059
D(CPA)	0.718228	0.370097	1.940649	0.0647
D(CPF)	-0.300823	0.187033	-1.608392	0.1214
D(CPM)	2.161534	0.343585	6.291119	0.0000
D(CPE)	-11.77646	11.37998	-1.034840	0.3115
D(CPMA)	-3.559975	1.350040	-2.636940	0.0147
ECM(-1)	0.106685	0.205740	0.518542	0.6090
R-squared	0.802982	Mean dependent var		1243.851
Adjusted R-squared	0.751586	S.D. dependent var		1944.357
S.E. of regression	969.0899	Akaike info criterion		16.79156
Sum squared resid	21600111	Schwarz criterion		17.11850
Log likelihood	-244.8733	Hannan-Quinn criter		16.89615
F-statistic	15.62343	Durbin-Watson stat		1.214098
Prob(F-statistic)	0.000000			

Source: Authors' computation

From table 7, our ECM value of 0.106685 is an indication that approximately over 11% disequilibrium in short run is being adjusted back to the equilibrium annually. Considering that negativity in this test indicates significance, the ECM is not rightly signed and does not show a reasonable dynamics of GDP to the explanatory variables.

4.4. Analysis of Direction of Causality

This was done by employing the Granger Causality test with the result shown in table 8.

Table-8. Granger Causality Result

Pairwise Granger Causality Tests			
Date: 03/05/16 Time: 23:34			
Sample: 1981 2011			
Lags: 2			
Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
CPF does not Granger Cause GDP	29	6.55962	0.0053
GDP does not Granger Cause CPF		19.5439	9.E-06
CPA does not Granger Cause GDP	29	0.11660	0.8904
GDP does not Granger Cause CPA		5.28639	0.0125
CPM does not Granger Cause GDP	29	0.00021	0.9998
GDP does not Granger Cause CPM		10.5969	0.0005
CPE does not Granger Cause GDP	29	0.13026	0.8785
GDP does not Granger Cause CPE		2.45480	0.1072
CPMA does not Granger Cause GDP	29	0.02475	0.9756
GDP does not Granger Cause CPMA		4.19339	0.0274

Source: Authors' computation

A cursory look at table 8 reveals that there is no bidirectional relationship between our employed variables, however, a unidirectional relationship was observed from CPF to GDP, GDP to CPA, GDP to CPM, and GDP to CPMA. Meanwhile, no directional relationship of any kind was observed between GDP and CPE.

With respect to impulse response, our result in table 9 is instructive.

Table-9. Impulse response to one S.D innovation (shocks)

Response of GDP:						
Period	GDP	CPF	CPA	CPM	CPE	CPMA
1	352.8825	0.000000	0.000000	0.000000	0.000000	0.000000
	(46.3357)	(0.00000)	(0.00000)	(0.00000)	(0.00000)	(0.00000)
2	712.7930	445.5381	-150.2083	-275.2191	146.9859	388.4754
	(174.317)	(126.802)	(108.970)	(98.3831)	(88.8704)	(88.2438)
3	749.1952	162.2482	-197.7265	-262.3121	166.5136	158.5324
	(249.738)	(190.087)	(180.114)	(156.755)	(147.498)	(205.766)
4	964.9543	-398.7275	-296.7184	-276.7468	115.6562	243.5147
	(307.365)	(206.785)	(228.357)	(205.192)	(187.574)	(223.010)
5	806.7825	506.4886	-121.3214	-42.89496	489.2134	502.6698
	(369.075)	(317.819)	(310.123)	(276.929)	(275.721)	(281.929)
6	1072.741	712.0115	-426.8673	-313.1428	67.60833	188.5009
	(440.251)	(348.493)	(346.743)	(275.904)	(333.051)	(359.338)
7	1265.129	-568.3925	-802.6774	-212.7225	433.3657	410.8613
	(559.308)	(555.182)	(426.521)	(326.301)	(421.036)	(429.634)
8	1381.683	245.3877	-140.9334	-66.33712	704.9590	182.1812
	(677.859)	(770.238)	(497.595)	(366.983)	(565.333)	(546.589)
9	1566.384	1583.550	-521.1246	-440.6291	67.53235	600.8894
	(813.623)	(921.867)	(548.387)	(462.396)	(775.184)	(583.877)
10	1954.987	166.3731	-1345.494	-620.1609	575.4731	737.6306
	(979.184)	(1477.26)	(723.451)	(552.365)	(926.045)	(740.024)

Source: Author's computation

In the above table, we report the result of the impulse response estimate to one standard deviation shock in each of the variables in the VAR system for ten years period. The result shows that response of GDP to own shock

at short run is positive at 72% and 13.81% at long run. However, impulse responses of GDP to shocks emanating from our dependent variables at short run are positive for CPF, CPE, and CPMA at 44.5%, 14.6%, and 38.8% respectively and negative for CPA and CPM at 15% and 27.5% respectively. Meanwhile, at long run, impulse response of GDP to shocks from CPF, CPA, CPM, CPE, and CPMA retained the same sign but varies in values with 24.5%, 14%, 66%, 70.4%, and 18.2% respectively for CPF, CPA, CPM, CPE, and CPMA (see table 9).

Table-10. Variance Decomposition Estimate

Response of GDP:						
Period	GDP	CPF	CPA	CPM	CPE	CPMA
1	352.8825	100.0000	0.000000	0.000000	0.000000	0.000000
2	1049.729	57.40834	18.01423	2.047545	6.873898	1.960637
3	1360.261	64.52393	12.15086	3.332321	7.812373	2.666127
4	1782.621	66.87242	12.07816	4.710901	6.959102	1.973353
5	2143.299	60.42861	13.93950	3.579203	4.854049	6.574997
6	2563.561	59.75038	17.45786	5.274542	4.885090	4.665489
7	3088.951	57.92783	15.41010	10.38530	3.838879	5.181661
8	3473.515	61.63377	12.68587	8.377642	3.072379	8.216798
9	4225.855	55.38104	22.61313	7.180926	3.163012	5.577056
10	4977.723	55.33937	16.40949	12.48183	3.831851	5.356067
1	352.8825	100.0000	0.000000	0.000000	0.000000	0.000000
2	1049.729	57.40834	18.01423	2.047545	6.873898	1.960637
3	1360.261	64.52393	12.15086	3.332321	7.812373	2.666127
4	1782.621	66.87242	12.07816	4.710901	6.959102	1.973353
5	2143.299	60.42861	13.93950	3.579203	4.854049	6.574997
6	2563.561	59.75038	17.45786	5.274542	4.885090	4.665489
7	3088.951	57.92783	15.41010	10.38530	3.838879	5.181661
8	3473.515	61.63377	12.68587	8.377642	3.072379	8.216798
9	4225.855	55.38104	22.61313	7.180926	3.163012	5.577056
10	4977.723	55.33937	16.40949	12.48183	3.831851	5.356067

Source: Authors' computation

According to Iyeli (2010) variance decomposition helps to determine the total proportion of forecast error to own innovation and to innovation in the other variables. Looking at the variance decomposition estimate above, it shows that own shock represents that greatest source of variations in the forecast error of our observed variable (GDP). For instance, own shock explains about 57.40% variations at short run and 61.63% in the long run, while our explanatory variables (CPF, CPA, CPM, CPE, and CPMA), explains about 18.01%, 2.04%, 6.87%, 1.96, and 13.70% variations in the short run and 12.68%, 8.38%, 3.07, 8.23, and 6.01% variations in the long run respectively. However, within the ten years, own shock and shock from other variables show a mixture of contribution to the variations in the forecast error of the explained variable (GDP).

4.5. Concluding Remarks

The study tried to ascertain the relationship between insurance risk management and growth of Nigerian economy over the years 1981 to 2011. Based on the above estimates and analysis, the study revealed that the risk management activities of insurance sector in Nigeria relates positively with the growth of the economy except in the area of marine insurance. However, using the Johansen co-integration test, the study observed the existence of equilibrium relationship among our employed variables and over 10% of any disequilibrium in the short run was found to adjust back over a year. However, a unidirectional relationship was observed from CPF to GDP, GDP to CPA, GDP to CPM, and GDP to CPMA. Following our findings and remarks, the study thereby recommends that1) The level of protocol required by insurance sectors in the case of indemnification should be greatly reduced through deliberate policy and its implementation;

2 Effective policy should be made to strengthen the activities of insurance industry in Nigeria.

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