

## INSURANCE MARKET DEVELOPMENT AND FINANCIAL STABILITY

<sup>1</sup>IHEJIRIKA, Peters O. & <sup>2</sup>EHIUGU, Chizoba P.

<sup>1</sup>Department of Banking and Finance, Imo State University Owerri, Nigeria

<sup>2</sup>Department of Insurance and Actuarial Sciences, Imo State University Owerri, Nigeria

<sup>1</sup>e-mail: [ihejirikap@yahoo.com](mailto:ihejirikap@yahoo.com)

### Abstract

*This study investigated the relationship between insurance sector development and financial stability in Nigeria for the period 1981 to 2016. The study employed ex post factor research design while data was collected through secondary sources. The study applied the Philip Ouliaris residual based cointegration test, to test the null hypothesis that there is no long run relationship between insurance sector development and financial stability in Nigeria. The estimated Philip-Ouliaris cointegration test (tau-statistic and normalized autocorrelation coefficient - the z-statistic) fail to reject the null hypothesis at the 5% level of significance suggesting that there is no long run relationship between Insurance sector development and financial stability in Nigeria. Given the finding of this study, the researchers concluded that there is no long run relationship between Insurance sector development and financial stability in Nigeria and recommended that both the Government and Insurance Operators in conjunction with the Insurance regulatory authorities re-examine their strategies at fulfilling the objectives which the Insurance sector abnatio were set to achieve, that is, risk management and stable financial environment.*

**Keywords:** Insurance, Development, Financial, Stability, Co-integration

### 1. Introduction

Insurance Markets—development and financial stability are of utmost essential to the effective functioning of every market economy. They pave way for rational decision making in the allocation of real resources through time and therefore improve the condition for savings and investment. Their unavailability creates damaging uncertainties that can lead to resource misallocation and unwillingness to enter into temporal contracts. In worst scenario, disruptions in the financial sector can have severe adverse effects on economic activity and even on political structures. Ensuring stability is thus a key objective of financial authorities and effective market development of insurance companies.

In recent times in economic literature, financial stability is one of the most widely researched issues. The relevance of analyses on financial stability was first recognized during the international financial crises at the end of the 90s, which was also strengthened by the financial and economic crisis emerging in 2007. These developments prompted the need for continuously providing the professional public opinion with an up-to-date and reliable picture of the condition of a of a given country's financial sector. When analyzing the stability of an institutional system; there is need to examine the degree in which the whole system is capable of resisting external and internal challenges. Of course, challenges do not always result in crises, but an unstable financial environment can in itself impede the healthy development of the economy.

The causes of financial instability reviewed in the literature may differ in relevance according to the period and countries drawn into the scope of analysis. Among the problem factors affecting the whole of the financial system are rapid liberalization of the financial sector, inadequate economic policy, non credible exchange rate mechanism, inefficient resource allocation, weak supervision, insufficient accounting and audit regulation, poor market discipline. These causes of financial crises emerge individually, collectively, or in a random combination, therefore the analysis of financial stability is an extremely complex task. Empirically studies have looked at a wide number of macroeconomic variables such as the link between the insurance sector and the size of the shadow system and financial stability across countries, others focused on insurance size, price of services and banking to financial stability without so much emphasizes on the effect of insurance market penetration and density on financial stability in Nigeria context.

This work, investigated the effect of insurance market development on financial stability in Nigeria. Specific objectives include establishing the relationship between insurance Penetration and financial stability in Nigeria and investigating the relationship between insurance market Density and financial stability in Nigeria. The study area focus is Nigeria. The work was divided into five sections. Section one and two dealt with the introduction and literature review respectively while section three and four cover the methodology and empirical finding. Section five covers summary of findings, conclusion and recommendations.

## **2. Literature Review**

### ***Conceptual Review***

#### ***Insurance Market Development***

Insurance market offers great contributions to economic development, in this line, Chen, Lee, and Lee, (2012) obtained findings to confirm this positive impact. The insurance industry plays a critical role in financial intermediation in any economy by its very mechanism of either providing indemnity or that of promoting savings. Moreover its ability to pool funds in the form of premiums enables it to be an important institutional investor (Sibindi & Godi, 2014). Arguably the development of the insurance sector ultimately fosters the development of the financial markets. The attendant benefit of highly developed liquid financial markets is that they aid economic growth. This ultimately advanced into an improved socio-economic status of a country. However, various attempts have tried to link how specific variables affect the development of insurance markets. In this study, insurance penetration and insurance density are the concepts of review in insurance market development.

#### **Insurance Penetration**

Insurance Penetration connotes a product's sales volume in relation to the sales volume of competing products. Within insurance, the percentage of GDP is the total premium from life and non life insurance penetration. Insurance penetration highlights the growth of premium with the growth of the gross domestic product in the economy. It is measured as ratio of premium to GDP. Insurance Penetration rate shows the extent of development of insurance sector in a country. In Nigeria, Total Gross Working Premiums are currently worth less than 1% of GDP, and premiums per capita were at around N1923 (\$6.07) in 2015, the latter of which was one of the lowest rates in the world (Oxford Business Group, 2017). The low insurance penetration rate in Nigeria is widely regarded as an indicator of the nation's growth potential. Swiss Re (2004) has analyzed these factors mostly from the point of view of businesses. Among the factors that determine insurance growth are the savings level and per capita GDP, which have a positive impact on insurance but also benefit from the development of insurance markets. Enz (2000) studied the relationship between insurance demand and GDP, highlighting many factors (including taxation, regulation, and risk coverage provided by the government) that limit insurance penetration in the market. Greene (1976) and Outreville (1992) examining the state's role in the insurance market.

#### **Insurance Density**

Insurance density is measured as the ratio of premium (in Naira) to total population. Insurance Density is the product's number of customers by geographic area (country, state etc). It is usually expressed as a ratio of premium to population. The measure of insurance density reflects the level of development of the sector. Insurance Density compares insurance sales volume of a customer group to another. The case of low insurance density and penetration is not unique to Nigeria as it is also prevalent in the rest of Africa excluding South Africa. Africa's insurance industry is still in its developmental stage and RisCura's Bright Africa 2015 report estimated that the Asset under Management (AUM) totals closely US\$273bn with the vast majority of these assets coming from South African insurance companies (85%). In the international map, 65% of insurance premiums written are contributed by the G7 (Canada, France, Germany, Italy, Japan, the United Kingdom and United States) which only constitute 10% of the world's population. The average premium spends in G7 countries in 2012 were US\$3.910 compared to US\$120 for emerging markets including Africa. In 2012, Africa's contribution to all global premiums written was 1.55%, well below its portion of global GDP, and reflective of the under-penetration of insurance in Africa.

In isolation, Nigeria's insurance penetration rate remains very low. The country recorded an insurance penetration rate of 0.4% in 2013 and the premiums per capita were only US\$10.8 in 2012, making it one of the lowest in the world; and consequently leaving the country with significant untapped potential for coverage within the life and non-life segments of the market. Amidst this, the sector has recorded growth over the past seven years with asset values doubling to US\$3.57bn in 2014 from US\$1.74bn in 2007. In 2015, Nigeria insurance penetration in non life insurance business was a mere 0.2 percent. It was one of the lowest rates in the world. According to Fola Daniels of the National Insurance Commission (NAICOM), Nigeria currently has the second largest insurance industry in Africa following South Africa. The industry is expected to continue to gain further growth and the rate of insurance penetration is projected to also increase.

Omolade (2015) observed that Nigeria is well placed for growth due to its growing population; currently estimated to be 182 million and emerging middle class driving economic activities. However, the Nigerian insurance sector is relatively small compared to its banking and formal pension savings industries, which are currently gaining significant traction.

### ***Financial stability***

*Financial stability reflects the ability of the financial system to consistently supply the credit intermediation and payment services that are needed in the real economy if it is to continue on its growth path.* Financial stability is a position in which the financial system, i.e. the key financial markets and the financial institutional system is resistant to economic shocks and is fit to smoothly fulfill its basic functions: the intermediation of financial funds, management of risks and the arrangement of payments.

### **Models for financial stability**

There are five key financial indicators to proxy financial stability for their relevance and availability from the World Bank's Global Financial Development Database (GFDD): these include; Financial system deposits to gross domestic product (GDP) (%), Domestic credit to private sector (% of GDP), Bank net interest margin (NIM) (%), Bank nonperforming loans to gross loans (%), and Customer to deposits and short-term funding (%).

These aggregate indicators are commonly used to represent features such as size, efficiency, accessibility, and quality of an economy's financial system. The deposits-to-GDP ratio is traditionally used as a measure of size of the financial system relative to the economy and gives a sense of the extent of financial intermediation, especially through banks. The ratio also serves as an indicator of the availability of access to financial savings in countries where the financial structure is dominated by the banking system (IMF 2005). The ratio of domestic credit to the private sector to GDP is another measure of depth of the financial sector, from the asset side as it measures loans made to the private sector by financial institutions. It is also considered as one of the proxies for the level of financial development of an economy. In financial institutions, the NIM is the difference between interest income and interest expense, expressed as a ratio to the amount of their interest-earning assets. A wide margin typically reflects frictions in intermediation; so that a low value of NIM is considered a proxy for higher efficiency. A nonperforming loan (NPL) is one that is in or close to a default. Measured relative to total gross loans, this ratio shows the quality of banking sector assets and may indicate weak capitalization of the banking sector. The last ratio is the percentage of customer deposits and short-term funding that could be met if suddenly withdrawn. A higher ratio indicates more liquidity and lower vulnerability to a bank run.

### **Theoretical Review**

#### **Informational Asymmetry Models**

Andreu (1995), Information asymmetry models assume that at least one party to a transaction has relevant information whereas the other(s) do not. Some asymmetric information models can also be used in situations where

at least one party can enforce, or effectively retaliate for breaches of, certain parts of an agreement whereas the other(s) cannot. The two critical informational problems that any insurance program faces are adverse selection and moral hazard. They are intimately tied to the difficulties associated with measuring risks and monitoring customer behavior. It may be very difficult for private entities to measure risks, collect relevant data, monitor producer behavior, and establish and enforce underwriting guidelines. These difficulties can result in high, sometimes prohibitive, transactions costs that preclude the development of private insurance markets. Losses and the events that trigger them can be difficult to define precisely (for example, the extent and nature of a disability). The insured is often able to withhold information important to the assessment of risks (for example, known medical conditions or tendencies). The existence of insurance can alter the insured's behavior (for example, unemployment insurance can create the moral hazard problem whereby the insured is less active in seeking and retaining employment than would be the case without the insurance). For these reasons, governments have long provided social insurance. Social insurance tends to be more prevalent in Western societies where family networks and other support groups have broken down in the process of industrialization. Insurance provided by private insurers (market insurance) is more common in areas such as casualty and property, where the problems listed above are less of a concern. In adverse selection models, the ignorant party lacks information while negotiating an agreed understanding of or contract to the transaction, whereas in moral hazard the ignorant party lacks information about performance of the agreed-upon transaction or lacks the ability to retaliate for a breach of the agreement. An example of adverse selection is when people who are high risk are more likely to buy insurance, because the insurance company cannot effectively discriminate against them, usually due to lack of information about the particular individual's risk but also sometimes by force of law or other constraints. An example of moral hazard is when people are more likely to behave recklessly after becoming insured, either because the insurer cannot observe this behavior or cannot effectively retaliate against it, for example by failing to renew the insurance.

The theory Informational Asymmetry Models supports the study on the ground that insurance penetration and density in Nigeria to a larger extent depend on the willingness of the insured to disclose material facts about the risk (physical and moral hazard) and which leaves the insurer with adverse selection of risk. This adverse selection model affects the insurance market development and financial stability.

### **Empirical Review**

The Deutsche Bundes bank (2014) estimated the transmission of risk between insurers and other sectors of the economy using market data. A multivariate GARCH model was used to measure the interdependence between the prices of credit default swaps (CDS) issued by big insurance companies – including large German insurers – and major banks. The study found a statistically significant correlation between insurers' and banks' default risk for the period from 2004 to 2011. The Deutsche Bundes bank (2014) applied Granger- causality analyses to examine the interaction in relation to the prices of CDS issued by big insurance companies – including large German insurers – and major banks. To differentiate between banks' and insurers' impact on the real economy and vice versa, non-financial corporation's (NFCs) were also included in the analysis. In the 2004 to 2007 sub- period, the study found that an increase in insurers' risk – as measured by the prices of CDS – contributes significantly to an increase in risk in the banking sector.

Vucetich, Perry and Dean (2014) wrote on the insurance sector and economic stability in New Zealand. They use descriptive statistics (pie charts, bar charts and histograms) to analyse and show case the importance of the insurance sector to economic stability. They also presented an insurance business model that relates Insurance activity to economic stability. Vucetich, Perry and Dean (2014) concluded that the insurance sector makes an important contribution to the economic development and welfare of New Zealand by enabling risk transformation. In this way, the insurance sector supports investment, innovation and economic growth, making it important that there is a healthy and well-functioning insurance sector. They observed that disruption to insurance services may have economy-wide effects due to its size, its services not being easily or effectively substitutable, its interconnectedness with other financial institutions, or the extent of non-traditional non-insurance activity.

Ivan, Dušan and Tatjana (2015) theoretically examined the influence of insurance companies on the financial market by analyzing insurance companies to determine how and in what way they affect business of financial market in Serbia. They concluded the insurance industry has a very important role in the financial systems of countries around the world.

D'Hulster and Hofmann (2016) asked in their empirical study insurance sector investments and their impact on financial stability whether insurers could through common movements in their investment behaviour, impact prices of financial instruments to such a degree that a collective reallocation of assets may have systemic implications. Using correlation analyses they examined how changes in insurance assets correlated to the same changes for banks in the United States for the period 1998 to 2015 using quarterly data. They found that the relationships between insurers' and banks' asset allocations were generally weakly positive (ranging from 0.0 to 0.4) and that these relationships were not statistically significant across all asset classes. They reported that their findings were in line with those of other academic studies, including the network analysis of the EU insurance sector performed by the European Systemic Risk Board (see Alves, Brinkhoff, Georgiev, Héam, Moldovan & Scotto di Carlo, 2015), which found low interconnectivity between the network of EU insurance groups, banks and other financial institutions.

Diallo and Abdullah, (2017) studied shadow banking, insurance and financial sector stability. The study was motivated by the recent financial crisis and the near collapse of the insurance giant American International Group (AIG). They empirically studied the link between the insurance sector, the size of the shadow system and financial stability across countries. Using the Z-score as a measure of financial stability and the ratio of insurance assets to GDP for 26 countries during the period 1998–2011, the results shows that: (i) the insurance sector is negatively and significantly related to financial stability, and that (ii) using the shadow banking system as a channel, the insurance sector is detrimental to financial stability for countries with a high level of shadow banking assets.

Other empirical studies have looked at a wide number of macroeconomic variables such as the link between the insurance sector, the size of the shadow system and financial stability across countries, other focus on insurance size, price of services and banking to financial stability without so much emphasizes on the effect of insurance market penetration and density on financial stability in Nigeria context. This forms the gap which the objective this study stands to fill.

### 3. Research Method

The study adopted an industry wide coverage i.e., total insurance industry data were used and covered the period 1981 to 2016. Annual data for population, nominal GDP, total premium and financial stability variable (credit to private sector to GDP ratio) were sourced from Central Bank of Nigeria (CBN) Statistical Bulletin 2016. Insurance penetration (Premium/GDP), Insurance Density (Premium/Population) was computed. For the purpose of analysis, the main variables (financial stability -credit to private sector to GDP ratio), Insurance penetration (Premium/GDP) and Insurance Density (Premium/Population) were logged with the help of E-views 10 software to remove any difference in the units of measurement of these variables.

#### Model Specification

Following the regression model, the estimated model is specified first in the functional form as:

$$cps/gdp = f(ID, IP) \dots \dots \dots 1$$

While the estimated equation shown below is specified as log variables:

$$\ln(cps/gdp)_t = C_0 + C_1 \ln ID_t + C_2 \ln IP_t + \epsilon_t \dots \dots \dots 2$$

Where:

$\ln(cps/gdp)_t$  = Natural logarithm of Credit to private sector to GDP ratio at time t

$\ln IP$  = Natural logarithm of Insurance Penetration at time t

$\ln ID$  = Natural logarithm of Insurance Density at time t

$C_0$  = the intercept

$\epsilon_t$  = Error term

$C_1$  and  $C_2$  are the parameters to be estimated

Apriori:  $C_1 > 0$  and  $C_2 > 0$

### Analytical Procedure

#### Cointegrating Regression and Philip Ouliaris Residual-Based Cointegration Test

The finding that many macro time series and indeed financial variables exhibit stochastic tendencies and therefore may contain a unit root has spurred the development of the theory of non-stationary time series analysis. Engle and Granger (1987) pointed out that a linear combination of two or more non-stationary series may be stationary. If such a stationary linear combination exists, the non-stationary time series are said to be cointegrated and may be interpreted as a long-run equilibrium relationship among the variables. However, for test to be valid, all of the series must be integrated of order 1; i.e., I (1). Thus, the researchers adopt the Phillips-Ouliaris Residual-Based Cointegration Test in estimating and testing the proposed single equation model (equation 2 above) to establish the relationship between insurance market development and financial stability in Nigeria. Phillips-Ouliaris introduced two residual-based tests namely: the variance ratio test and the multivariate trace statistics. These residual-based tests are used in the same way as the unit root tests, but the data are the residuals from the cointegrating regression. We worked with the standard representation of a regression specification and considered the three dimensional time series vector process with cointegrating equation:

$$y_t = X'_t\beta + D'_{1t}\gamma_t + u_{1t} \dots \dots \dots 3$$

Where  $D_t = (D_{1t}, D_{2t})$  are deterministic trend regressors,  $X_t$  are strictly exogenous regressors and n stochastic regressors. It is assumed that the elements of  $y_t$  and  $X_t$  are I(1) and cointegrated.

### 4. Analysis and Results

**Table 4.1: Summary of Unit Root Test Results**

Variable	ADF-Statistics		5% critical value		~I(d)
	level	1 <sup>st</sup> diff.	level	1 <sup>st</sup> diff.	
CPS/GDP	-0.686066	-5.453574	-2.948404	-2.951125	I(1)
<b>Ins. Density</b>	<b>-1.450438</b>	<b>-4.539942</b>	<b>-2.948404</b>	<b>-2.951125</b>	I(1)
<b>Ins. Penetration</b>	<b>-0.867072</b>	<b>-5.156939</b>	<b>-2.948404</b>	<b>-2.951125</b>	I(1)

The results of the ADF unit root test in table 4.1 show that all the variables were integrated at order 1. Thus they qualify for cointegration testing under the Phillip Ouliaris residual based cointegration adopted for this study.

#### Cointegrating Regression Result

We estimate a Cointegrating Ordinary Least Square Regression on the levels of data as a first step to the Phillip Ouliaris residual based cointegration. The results of the cointegrating regression were then subjected to a cointegration test using Phillip Ouliaris residual based cointegration test. The results are shown below in Table 4.2. The estimated Philip-Ouliaris cointegration test fail to reject the null hypothesis which says that variables are not cointegrated at the 5% level of significance suggesting that there is no long run relationship between Insurance sector development and financial stability in Nigeria. This is evident from the Phillips-Ouliaris tau-statistic (t-statistic) value of -3.052482 and probability 0.2883 as well as the normalized autocorrelation coefficient (the z-

statistic) value of -16.20442 and probability 0.2090 for residuals obtained using each series in the group as the dependent variable in a cointegrating regression. Furthermore, the finding that there is no long run relationship between Insurance sector development and financial stability in Nigeria render the result of the cointegrating regression spurious and of no consequence despite the observed significant relationship as shown in appendix 1.

**Table 4.2: Cointegration Test - Phillips-Ouliaris**

Null hypothesis: Series are not cointegrated				
		Value	Prob.*	
Phillips-Ouliaris tau-statistic		-3.052482	0.2883	
Phillips-Ouliaris z-statistic		-16.20442	0.2090	
*MacKinnon (1996) p-values.				
Intermediate Results:				
Rho - 1		-0.344824		
Bias corrected Rho - 1 (Rho* - 1)		-0.462984		
Rho* S.E.		0.151674		
Residual variance		0.027436		
Long-run residual variance		0.038834		
Long-run residual autocovariance		0.005699		
Number of observations		35		
Number of stochastic trends**		2		
**Number of stochastic trends in asymptotic distribution.				

For the intermediate results, Spearman's Rho is a non-parametric test used to measure the strength of association between two variables, where the value  $r = 1$  means a perfect positive correlation and the value  $r = -1$  means a perfect negative correlation. The results of the analysis against apriori expectation reveal a weak negative correlation of -34.48% between Insurance sector development and financial stability.

Table 4.3 show the Philip Ouliaris Cointegration test re specified using the group method. Here, each of the variables was made a dependent variable in the model and the results are similar and agree to the conclusion that the variables are not cointegrated with the tau-statistic and the z-statistics uniformly failing to reject the null of no cointegration at conventional levels.

Table 4.4: Philip Ouliaris Cointegration test				
Series: LCPSGDP LDENSITY LPENETRATION				
Null hypothesis: Series are not cointegrated				
Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
CPS/GDP	-2.911153	0.3483	-14.47438	0.2945
DENSITY	-2.268662	0.6659	-9.202318	0.6612
PENETRATION	-2.807521	0.3960	-14.56141	0.2897
*MacKinnon (1996) p-values.				

## 5. Summary of Findings

The estimated Philip-Ouliaris cointegration test (tau-statistic and normalized autocorrelation coefficient - the z-statistic) failed to reject the null hypothesis at the 5% level of significance suggesting that there is no long run relationship between Insurance sector development and financial stability in Nigeria. Furthermore, the insurance sector is shown to be negatively and insignificantly related to financial stability as revealed by the Spearman's Rho value of -0.344824.

## Discussion of the findings

The results of this study agree with the findings of D'Hulster & Hofmann (2016) who found weakly positive relationships between insurance development and financial stability in the US. However, while D'Hulster & Hofmann (2016) found a weakly insignificant positive relationship, this study indicates a negative insignificant relationship. On the other hand, the results of this study lend support to Diallo & Abdullah, (2017) whose study revealed that the insurance sector is negatively related to financial stability although this disagree with the significant relationship posited by Diallo & Abdullah, (2017). Furthermore, the findings of this study negate the results of Ivan, Dušan, & Tatjana (2015) who reported that the insurance industry has a very important role in the financial systems of countries around the world". Comparably, the findings of this study were in agreement with the results of Alves, Brinkhoff, Georgiev, Héam, Moldovan & Scotto di Carlo, (2015) which found low interconnectivity between the network of EU insurance groups, banks and other financial institutions as well as the International Association of Insurance Supervisors (2011) and Trainar, (2004). Clearly, Vucetich, Perry and Dean (2014) conclude that the insurance sector makes an important contribution to the economic development and welfare of New Zealand by enabling risk transformation. Unfortunately, the present study failed to empirically support the findings of Vucetich, Perry and Dean (2014) though from economic theory standpoint, Insurance development should be a stabilizing factor in the financial system as it minimizes the risks inherent in financial operations through risk assessment, identification, risk transfer and general risk management services. However, these results differed from the findings of Diallo & Abdullah, (2017), as well as that of Ivan, Dušan & Tatjana (2015).

## 6. Conclusion and Recommendations

This study investigated the relationship between insurance sector development and financial stability in Nigeria for the period 1981 to 2016. Insurance sector development as measured with insurance density and insurance penetration was modeled against credit to private sector as ratio of Gross domestic product representing financial stability. The study applied the Philip Ouliaris residual based cointegration test to test the null hypothesis that there is no long run relationship between insurance sector development and financial stability in Nigeria. This study concludes that there is no long-run relationship between Insurance sector development and financial stability in Nigeria. Given the findings of this study, it is recommended that both the government and insurance operators in conjunction with the insurance regulatory authorities should re-examine their strategies at fulfilling the objectives which the insurance sector abnitio were set to achieve; that is risk management and stable financial environment.

## References

- Alves, I. Brinkhoff, J. Georgiev, S. Héam, J.C, Moldovan, I. & Scotto di Carlo, M., (2015). Network analysis of the EU insurance sector, *ESRB Occasional Paper, No. 7*.
- Andreu M. C, Whinston, M. D. & Green, J. R., (1995). *Microeconomic theory*. New York: Oxford University Press.
- Chen, P. F, Lee, C.C. & Lee, C.F., (2012). How does the development of the life insurance market affect economic growth? Some international evidence, *Journal of International Development, 24: 865–893*.
- D'Hulster A. M., & Hofmann D. M., (2016). Insurance sector investments and their impact on financial stability - an empirical study. The Geneva Association -International Association for the Study of Insurance Economics' *JUNE*
- Diallo, B. & Al-Mansour. A., (2017). Shadow banking, insurance and financial sector stability. *Research in International Business and Finance, Elsevier 42 (C)224-232*.



- Engle, R.F. & Granger, C.W.J., (1987) Co-integration and error correction: Representation, estimation and testing. *Econometrica*, 55: 251-276
- Enz, R., (2000) The S Curve Relation between Per Capita Income and Insurance Penetration. *Geneva Papers on Risk and Insurance* 25 (3): 396-406.
- Greene M., (1976). Government as an Insurer. *Journal of Risk Management* 43 (3): 393-407.
- Hansen, B. E., (1992b). Tests for parameter instability in regressions with I(1) Processes. *Journal of Business and Economic Statistics*, 10, 321-335.
- Ivan P, Dušan C, & Tatjana P. (2015). Role of insurance companies in financial market. *Faculty of Business Economics and Entrepreneurship International Review*, 1-2
- Omolade O. R., (2015). Nigeria's insurance sector: Growth beckons. 03 Dec, 12:00 Am Outreville, J. F., (1990). The economic significance of insurance markets in developing countries. *Journal of Risk and Insurance*, 487-498
- Park, J., Y., (1992). Canonical cointegrating regressions, *Econometrica*, 60, 119-143.
- Phillips, P. C. B. & Hansen B. E., (1990). Statistical Inference in Instrumental Variables Regression with I(1) Processes. *Review of Economics Studies*, 57, 99-125.
- Phillips, P. and S. Ouliaris, (1990). Asymptotic properties of residual based tests for cointegration. *Econometrica*, 1: 165-193.
- Saikkonen, Pentti (1992). Estimation and Testing of cointegrated systems by an autoregressive approximation, *Econometric Theory*, 8, 1-27.
- Sibindi, A.B. & Godi, N.J., (2014). Insurance sector development and economic growth: evidence from South Africa. *Journal of Corporate Ownership & Control*, 11, 4, 530-538.
- Stock, J. H. & Watson M., (1993). A simple estimator of cointegrating vectors in higher order integrated systems, *Econometrica*, 61, 783-820.
- Stringa, M & Monks, A (2007). Inter-industry contagion between UK life insurers and UK banks: an event study, *Working Paper 325, Bank of England, May*.
- Swiss RE (2004). Exploiting the growth potential of emerging insurance markets. *Sigma 5. Swiss Reinsurance Company Economic Research and Consulting Publisher*
- The Deutsche Bundesbank (2014). Analyses of the importance of the insurance industry for financial stability *Deutsche Bundesbank Monthly Report July*
- International Association of Insurance Supervisors (IAIS) (2011). *Insurance and financial stability*. Retrieved on 11th November, 2011 from [www.iaisweb.org](http://www.iaisweb.org)
- Trainar, P., (2004). Insurance and financial stability. *Financial Stability Review Banque de France, Issue 5: 73-89, November*.
- Vucetich A, Perry R & Dean R., (2014). The insurance sector and economic stability *Reserve Bank of New Zealand: Bulletin*, 77( 3) September

**APPENDIXES**

<b>Appendix 1</b>				
Dependent Variable: LCPSGDP				
Method: Fully Modified Least Squares (FMOLS)				
Date: 07/29/18 Time: 23:34				
Sample (adjusted): 1982 2016				
Included observations: 35 after adjustments				
Cointegrating equation deterministic: C				
Additional regressor deterministic: @TREND				
Long-run covariance estimate (Bartlett kernel, Andrews bandwidth = 4.5122)				
No d.f. adjustment for standard errors & covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDENSITY	0.145178	0.027777	5.226517	0.0000
LPENETRATION	-0.372110	0.067405	-5.520531	0.0000
C	0.310902	0.415234	0.748741	0.4595
R-squared	0.717743	Mean dependent var		2.281704
Adjusted R-squared	0.700102	S.D. dependent var		0.422793
S.E. of regression	0.231534	Sum squared resid		1.715457
Long-run variance	0.098620			

**Appendix 2**

Philip Ouliaris Cointegration test				
Date: 07/31/18 Time: 03:02				
Series: LCPSGDP LDENSITY LPENETRATION				
Sample: 1981 2016				
Included observations: 36				
Null hypothesis: Series are not cointegrated				
Cointegrating equation deterministics: C				
Additional regressor deterministics: @TREND				
Long-run variance estimate (Prewhitening with lags = -1 from SIC maxlags = -1, Bartlett kernel, Andrews bandwidth)				
No d.f. adjustment for variances				
Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
LCPSGDP	-2.911153	0.3483	-14.47438	0.2945
LDENSITY	-2.268662	0.6659	-9.202318	0.6612
LPENETRATION	-2.807521	0.3960	-14.56141	0.2897
*MacKinnon (1996) p-values.				
Intermediate Results:				
		LCPSGDP	LDENSITY	LPENETRATION
Rho - 1		-0.344824	-0.224236	-0.324337
Bias corrected Rho - 1 (Rho* - 1)		-0.413554	-0.262923	-0.416040
Rho* S.E.		0.142058	0.115894	0.148188
Residual variance		0.027436	0.533938	0.137983
Long-run residual variance		0.034066	0.639135	0.181229
Long-run residual autocovariance		0.003315	0.052599	0.021623
Bandwidth		NA	NA	NA
Number of observations		35	35	35
Number of stochastic trends**		2	2	2
**Number of stochastic trends in asymptotic distribution				