INSURANCE SECTOR DEVELOPMENT AND ECONOMIC GROWTH: EVIDENCE FROM SOUTH AFRICA

Athenia Bongani Sibindi*, Ntwanano Jethro Godi**

Abstract

Arguably the insurance sector may contribute to economic growth by its very mechanism of risk transfer and thereby providing indemnity as well as by the intermediation role it plays in the economy. Insurance can also be used as a vehicle of savings mobilisation. In this article we investigate the causal relationship between the insurance sector (long-term, short-term and total insurance) and economic growth in South Africa for the period 1990 to 2012. We make use of insurance density as the proxy for insurance market development and real per capita growth domestic product as the proxy for economic growth. We then test for cointegration amongst the variables by applying the Johansen procedure and then test for Granger causality based on the vector error correction model (VECM). Our results confirm the existence of at least one cointegrating relationship and also indicate that the direction of causality runs from the economy to the long-term insurance, as well as from the economy to the total insurance sector. This is consistent with the 'demand-following' insurance-growth hypothesis.

Keywords: Insurance Sector Development, Economic growth, Granger Causality, South Africa

** Lecturer –University of South Africa, Department of Finance ,Risk Management and Banking, P.O Box 392, UNISA, Pretoria 0003*
Email: sibinab@unisa.ac.za
Tel: +27(0) 12 -429 3757
Fax: +27 (0) 86-569-8848
Cell: +27(0) 78-410-0508
*** Lecturer –University of South Africa, Department of Finance ,Risk Management and Banking, P.O Box 392, UNISA, Pretoria 0003.*
Email: godinj@unisa.ac.za
Tel: +27(0) 12 -429 8895
Fax: +27 (0) 86-569-8843
Cell: +27(0) 82-460-3735

1. Introduction

The finance-real sector growth nexus debate continues unabated. However it has largely focused on either the banking sector or the stock market and scant research has been conducted to unravel the relationship between the insurance sector and the real sector. It is imperative to highlight that the insurance sector plays a critical role to 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.

The present study aims to contribute to the finance-growth nexus literature by specifically focusing on the insurance sector in the context of South Africa. Hitherto the studies that have been conducted focusing on South Africa have largely been of a cross-sectional or panel nature (See for example Han, Li, Moshirian etal, 2010 and Azman-Saini and Smith, 2011). The major disadvantage of panel data methods of analysis is that the country specific effects could be ignored or at worst lost altogether in the analysis. As such it is essential to also interrogate the relationship between insurance sector development and economic growth by conducting time series studies on South Africa. The motivation in selecting South Africa as the focus of this study lies in its stage of development and the sophistication of its financial sector notwithstanding that it is a developing country.

The impetus behind this study is also to establish the nature of the relationship between the insurance sector and economic growth in South Africa in light of the findings by Ward and Zurbruegg (2000) which are later corroborated by Chang, Lee and Chang (2013) to the effect that the insurance-growth nexus varies from country to country. To the best of our knowledge there has been no in-depth study that has focused on South Africa. It is equally impelling that Ward and Zurbruegg (2000) suspect that cultural, regulatory, legal environment and the improvement in financial intermediation amongst other factors may confound the insurance-growth relationship. It could be argued that South Africa presents itself as the best

case study as it has a very diverse culture, its financial system has improved vastly over the years and attendant to this the regulatory environment has also evolved over the years.

We thus also hope to chat the way forward for policy makers in South Africa as they grapple with policies that are aimed at recovering her economy and securing the financial sector, specifically targeted at the insurance sector. To this end there has been a raft of reforms that have been proposed. Amongst others, these include the Solvency Assessment Management (SAM) regime whose main aim is to improve the capital and solvency levels of insurance companies as well as the Treating Customers Fairly (TCF) regulations which are aimed at protecting the insurance consumers. We intend to investigate the causal relationship between insurance sector development and economic growth by first testing for cointegration amongst the variables for a long run relationship by applying the Johansen procedure. We will then estimate a Vector Error Correction Model (VECM). Lastly we will then conduct Granger Causality/Block Exogeneity tests based on the vector error correction model to determine the nature and direction of flow of causality amongst the variables.

The remainder of paper is arranged as follows: the next section reviews the literature about the insurance-growth nexus. Section 3 reviews the empirical literature. Section 4 gives an overview of the insurance sector in South Africa. Section 5 describes the data, methodology and presents the empirical results. Section 6 discusses economic and policy implications and then Section 7 concludes.

2. Review of Literature: Insurance and Growth Nexus

The finance- economic growth nexus theory has evolved over the years and can be traced to the works of Schumpeter (1912) and later McKinnon (1973). The main argument by Schumpeter was the important role played by financial institutions in spurring technological innovation and economic activities. The financial activities of savings mobilisation, project evaluation, risk monitoring and management facilitate these two functions. On the other hand McKinnon posits that financial development is stunted by restrictive government regulations, interest rate ceilings, loan subsidies and high reserve requirements for the banking sector.

It would seem that there is consensus amongst the scholars when characterising the finance-growth nexus as follows: (1) there is no causal relationship; (2) the causal relationship is demand-following, that is, economic growth leads to a demand in financial services; (3) the causal relationship is supply-leading, that is growth in the financial sector will spur economic growth; (4) negative causal relationship from finance to growth; (5) interdependence.

Hitherto extant studies have interrogated the finance-growth nexus by mainly focusing on the stock markets and the banking sector. There is scant research that focuses on the insurance sector. The importance of the insurance sector in economic development continues to seize the attention of scholars and has gained prominence over the last two decades. Amongst the early scholars who interrogated this relationship include Ward and Zurbruegg (2000). They aver that insurance is important to economic development mainly because of the following two reasons: (1) the benefits that accrue as a result of the insurance company being an agent of risk transfer and indemnification and (2) the benefits that accrue as a result of the insurer undertaking activities as a financial intermediary. Using a sample of nine OECD countries they come to the conclusion that the causal relationships between economic growth and insurance market development may well vary across countries. Further they contend that the influence of insurance market development while channelled through indemnification and financial intermediation is tempered by country specific factors.

Haiss and Sümegi (2008) are in concordance with Ward and Zurbruegg (2000) and contend that the insurance sector is important to economic growth as it can be used as a channel of risk transfer, saving and investment. In their study of 29 European countries they found out that the aggregate investment by insurance companies grew by 20% relative to gross domestic product (GDP) within the time span of 1993-2004. They go on to observe that an essential part of the contribution of insurance companies to GDP growth derives from their assets, their investment activities and the companies' setup. Thus the participation by insurance companies in the economy results in the expansion of the investment horizon, increase of market volume and improvement of market efficiency.

The latter strand of literature emphasises the investment, innovation and financial development that is spurred by the growth of the insurance sector. According to the proponents of this view, insurance companies by providing protection could affect economic growth through the channels of marginal productivity of capital, technological innovations and saving rate (Ćurak, Lončar and Poposki, 2009). Thus insurance companies indemnify the ones who suffer a loss and stabilise the financial position of individuals and firms. They go on further to note that the possibility of transfer of risks to insurance companies induces risk adverse units to buy goods and services especially those of higher values. In this way insurance sustains demand or consumption of goods and services which encourage production, employment and finally economic growth. Ćurak, Lončar and Poposki (2009) also propound that insurance companies increase the availability of funds through their innovative products which provides protection from credit risk to other financial

intermediaries. In that way financial intermediaries become more willing to lend funds for financing real investments that encourage economic growth. They also contend that insurance could affect economic growth through the saving rate channel by offering various life insurance products that combine risk protection and saving benefits. Further they argue that insurers lower transaction costs or achieve economies of scale by collecting funds from dispersed economic units who pay relatively small premiums and by allocating these amassed funds to deficit economic units in order to finance large projects.

According to Azman-Saini and Smith (2011) insurance companies as financial intermediation agents create another dimension of competition in the market for intermediated saving which is expected to promote productive efficiency. Furthermore improved financial intermediation services allow investors to hold diversified investment portfolios, which facilitate a willingness to invest in risky high-productivity projects. Moreover, insurance markets boost liquidity which facilitates a flow of funds to capital-accumulating projects, resulting in the expansion of the economy. Further they posit that insurance may also have an indirect impact on output growth via its potential impact on the development of banks and stock markets. They contend that, for example, the provision of protection services to customers against risks that might otherwise leave them unable to repay their debts may promote bank lending.

In sum the relationship between the insurance sector and the real sector could be classified in terms of causality with respect to five possible hypotheses: (1) there is no causal relationship; (2) the causal relationship is demand-following, that is, economic growth leads to a demand in insurance services; (3) the causal relationship is supply-leading, that is growth in the insurance sector will spur economic growth; (4) negative causal relationship from insurance to growth; (5) interdependence (Blum et al. 2002)

3. Review of the Empirical Literature

Ward and Zurbruegg (2000) examined the relationship between economic growth and growth in the insurance industry for nine OECD countries. Using annual data they conducted a bivariate cointegration analysis and also tested for causality by regressing the real GDP against the total real premiums in each country from 1961 to 1996. They found out that in some countries the insurance industry Granger causes economic growth, and in other countries economic growth Granger causes the insurance sector development.

Haiss and Sümegi (2008) investigated the impact of insurance investment and premiums on GDP growth in Europe. They conducted a cross-country panel data analysis for 29 European countries for the period 2005 to 2009. The insurance indicators that they used are the gross premium income as a total sum of life and non-life premium income and total investments. They separated the aggregate sample into a group of mature market economies (mainly the "old" EU-15) and the other one consisting of former transition economies mainly the new EU member states from Central and Eastern Europe (CEE). Their results showed evidence for a correlation between insurance investments and GDP growth for EU-15 countries with mature financial markets and a short-run connection between non-life expenditure and GDP for the emerging market-type CEE countries.

Arena (2008) examined the causal relationship between the insurance market activity and economic growth in both developed and developing countries. He employed insurance penetration (insurance premiums as a percentage of GDP) as a proxy for insurance market development. By using generalised method of moments (GMM) for dynamic models of panel data for 55 countries between 1976 and 2004, he found a robust evidence for this relationship. He found that both life and non-life insurance have a positive and significant causal effect on economic growth

Ćurak, Lončar and Poposki (2009) using an endogenous growth model and panel data estimation techniques examined whether life and non-life insurance individually or collectively contribute to economic growth across a sample of 10 transition European member countries for the period 1992 to 2007. The proxy that they used for insurance development is insurance penetration. Their results indicated that insurance sector development positively and significantly promotes economic growth. The results were confirmed in terms of life, non-life insurance as well as total insurance.

Han, Li, Moshirian, et al (2010) investigated the relationship between insurance development and economic growth by employing generalised method of moments (GMM) models on a dynamic panel data set of 27 economies for the period 1994-2005. They used insurance density (premiums per capita) as a proxy for the insurance sector development. They found fairly strong evidence in favour of the hypothesis that insurance development contributes to economic growth. They find out that for the developing countries the overall insurance development, life insurance and non-life insurance development play a much important role than they do for the developed economies.

Ching, Kogid and Furuoka (2010) examined the existence of a causal relationship between the life insurance sector and economic growth in Malaysia by applying the Johansen cointegration test and the Granger causality test based on the Vector Error Correction Model (VECM). They used the total assets of the life insurance sector as an indicator for life insurance. They found out that there existed more than one cointegrating relationship between the real GDP and the total assets of life insurance sector. The

study further showed that the real GDP of Malaysia was Granger caused by the total assets of Malaysian life insurance sector in the short run.

Azman-Saini and Smith (2011) investigated the impact of insurance sector development on output growth, capital accumulation and productivity improvement using data from 51 countries (both developing and developed) for the period 1981-2005. They employed the life insurance penetration ratio as a proxy for the development of insurance markets. Making use of panel data methods of analysis they find evidence that insurance sector development affects growth predominantly through productivity improvement in developed countries, while in developing countries it promotes capital accumulation.

Islam (2012) utilised the error correction mechanism to test the causal relationship between the development of non-bank financial intermediaries (NBFIs) and economic growth in Malaysia over the period 1974-2004. He used the financial assets as the proxy for NBFI development. He then conducted Granger causality tests based on the vector error correction mechanism (VECM) and found out that there is a unique long-run causality running from nonbank financial intermediaries to economic growth.

Horng, Chang and Wu (2012) tested for a dynamic relationship amongst insurance demand, financial development and economic growth in Taiwan between 1961 and 2006. They used a three variable Vector Autoregressive (VAR model) with insurance density (premiums per capita) utilised as the proxy for insurance demand. They found out that in the short run, economic growth Granger causes insurance demand and financial development Granger causes economic growth. These results supported the 'supply-leading theory' link from financial development to economic growth and the 'demand-following theory' link from economic growth to insurance demand.

Chi-Wei, Hsu-Ling and Guochen (2013) applied the bootstrap Granger causality test to examine the relationship between insurance development and economic growth in 7 Middle Eastern countries. They used insurance density as the indicator for insurance development. They found evidence for bi-directional causality between the life insurance sector and economic growth in the higher income countries such as United Arab Emirates, Kuwait and Israel. They also found that economic growth Granger causes non-life insurance development in the low income countries of Oman, Jordan and Saudi Arabia.

Chang, Lee and Chang (2013) studied the relationship between insurance and economic growth by conducting a bootstrap panel Granger causality test using data from 10 OECD countries over the period of 1979-2006. They employed the life insurance, non-life insurance premiums and total insurance premiums as the proxies for insurance market activities. Their results were mixed and they found evidence of one-way Granger causality running from insurance activities to GDP in 5 out of OECD countries, namely France, Japan, Netherlands, Switzerland and the UK. Thus insurance is of great importance for economic growth in these countries. Secondly they found evidence of one-way Granger causality running from GDP to insurance activities in Canada (for life insurance activity), Italy (for total and life insurance activities) and the US (for total and non-life insurance activities). This result indicated that economic growth can increase demand of insurance and thus lead to the development of insurance markets. Thirdly they found out that in the US, there was two-way Granger causality (feedback) between life insurance activity and GDP lending credence to both the "supply-leading" and "demand-following" hypotheses. This result suggested that in the US the life insurance market and economic growth are both endogenous indicating that they mutually influence each other. Finally they found no causal relationship between insurance activities and GDP in Belgium (for all insurance activities), Canada (for total and non-life insurance activities), Italy (for non-life insurance activity) and Sweden (for life insurance activity). These results were consistent with the "neutrality hypothesis" for the insurance-growth nexus. This implied that insurance development and economic growth may not influence each other in those sectors and in Belgium.

4. An Overview of the Insurance Sector in South Africa

The insurance sector in South Africa comprises of 79 long-term insurers and 7 long-term reinsurers, 100 short-term insurance companies and 8 short-term reinsurance companies (FSB, 2012). In South Africa the insurance companies that transact life insurance business are referred to as long-term insurers. Similarly the companies that transact non-life (property) insurance are referred to as short-term insurers.

The key metrics of the insurance companies for the period 2011 to 2013 are given in Tables 1 and 2. The gross premiums of long-term insurance companies show a remarkable growth of 43% from about R301 billion registered in 2011 to roughly R430 billion registered in 2013. On the other hand the premiums of short-term insurance companies show steady growth of 19% from about R81 billion registered in 2011 to the levels of about R96 billion registered in 2013. A similar trend is observed when evaluating the total assets with the long-term insurance industry registering a phenomenon growth in total assets of 32% from roughly R1, 7 trillion in 2011 to R2, 3 trillion in 2013 as compared to the short-term insurance industry which shows steady growth of about 23% from roughly R90 billion in 2011 to R112 billion in 2013.

The information provided in Table 2 depicts the investment vehicles of the insurance companies. It would seem that for the long-term insurers the top three investment vehicles in order of importance are: equities and collective investment schemes, debentures and loan stock and cash and deposits. Whereas for short-term insurance companies the top three investment vehicles in order of importance are: cash and deposits, equities, government and semi-government bonds. Thus it would seem that the insurance companies both long and short-term play a critical role in intermediation, savings and resource mobilisation.

Table 1. Gross premiums and total assets of insurance companies in South Africa. *Source*: authors' own compilation, data from FSB (2013)

	2011		2012		2013	
	Long-Term Insurers	**Short-Term Insurers**	**Long-Term Insurers**	**Short-Term Insurers**	**Long-Term Insurers**	**Short-Term Insurers**
Gross Premiums / R'mil	300 650	80 951	358 967	87 675	429 703	96 178
Total Assets / R'mil	1 722 777	90 472	2 000 555	101 547	2 278 148	111 686

Table 2. The investments composition of insurance companies in South Africa: Source: authors' own compilation, data from FSB (2013)

	2011		2012		2013	
	Long-Term Insurers	**Short-Term Insurers**	**Long-Term Insurers**	**Short-Term Insurers**	**Long-Term Insurers**	**Short-Term Insurers**
Cash and deposits / R'mil	205 790	37 634	221 377	41 780	193 901	42 224
Government and semi-government / R'mil	191 549	6 963	173 874	9 597	178 194	11 888
Equities /R'mil	862 648	25 813	1 221 629	28 605	1 470 533	29 946
Debentures and loan stock / R'mil	128 379	1 666	176 585	1833	215 743	1903
Immovable Property / R'mil	58 833	-	58 152	-	49 571	-
Fixed Assets / R'mil	181 838	1 004	2 112	842	2 367	1 091
Debtors / R'mil	94 965	7 265	118 589	7 980	133 930	9 027
Outstanding Premiums / R'mil	-	5 815	-	7 016	-	8 375
Other Assets / R'mil	0	4 311	28 235	3 893	33 909	7 231
Total Assets / R'mil	1 724 002	90 472	2 000 555	101 547	2 278 148	111 686

5. Data and Methodology

5.1 Measures of Insurance Sector Development

In this paper we make use of insurance density as a proxy to gauge the level of insurance sector development in South Africa. Insurance density is defined as premiums per capita, measured by quarterly premium payments divided by the population. This follows the procedure adopted by Han, Li, Moshirian, et al, 2010 and Horng, Chang and Wu, 2012 amongst other. In our model we make use of quarterly data. We employ the real gross domestic product (RGDP) per capita as a proxy for economic growth, short-term insurance density (STID), long-term insurance density (LFID) and total insurance density (TID) as proxies for insurance development. The quarterly, gross domestic product and insurance premium data for the years 1990 to 2012 was obtained

from the South Africa Reserve Bank (SARB) database. The national population figures were extracted from the International Financial Statistics (IFS) database. A GDP deflator was applied on the nominal values to calculate the real values, with the year 2000 being set as the base year.

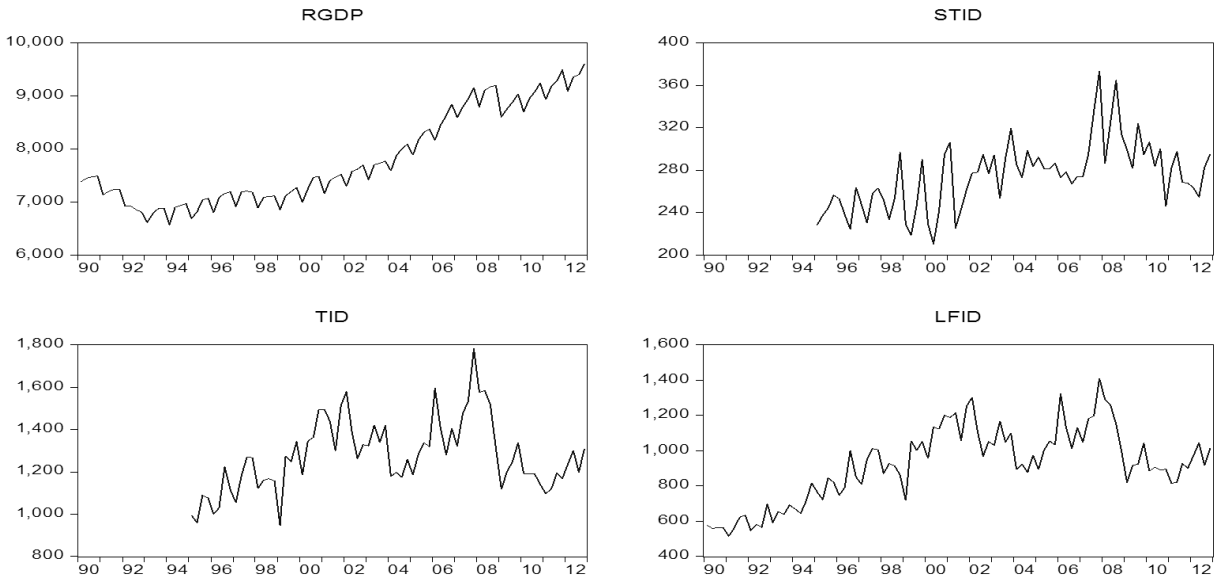

Figure 1. Trends of insurance sector development indicators in South Africa during the period 1990 to 2012

Source: authors' own compilation, data from SARB (2013)

The trends in insurance sector development and economic growth are shown in Figure 1. The gross domestic product per capita (RGDP) shows an upward trend, though it takes a dip between 1991 and 1992. It then peaks at around R9000 at the end of 2008 then declines in 2009 before it ultimately recovers. This is explicable as it corresponds to the period of financial crises. The short-term insurance density (STID) shows an upward movement from levels around R230 per capita in 1994 to a peak of R370 per capita in 2007 before it declines to levels around R240 per capita in 2010 and finally recovers to levels around R290 per capita in 2012. Long-term insurance density (LFID) shows a much steeper sustained upward growth from levels around R560 per capita in 1990 to a peak of around R1400 per capita in 2007. It would then decline to about R820 per capita in 2009 before it recovered to levels around R1020 per capita in 2012. A similar trend is observed for total insurance density. Thus it is evident that the series exhibit some form of co-movement and hence we suspect that they are cointegrated in the long run.

5.2 Empirical model specification and estimation techniques

In order to investigate the relationship between insurance sector development and economic growth, we make use of the Granger causality test. The Granger causality test is based on the vector error correction model between insurance sector development and economic growth.

A vector error correction (VEC) model is a restricted VAR designed for use with non-stationary series that are known to be cointegrated. The VEC has cointegration relations built into the specification so that it restricts the long run behaviour of the endogenous variables to converge to their cointegrating relationships while allowing for short-run adjustment dynamics. We adopt the procedure followed by Odhiambo (2008) and test for Granger causality based on the error correction model which can be expressed as follows:

(1)

$$\Delta lrgdp = a_0 + \sum_{i=1}^{n} a_{1i} lrgdp_{t-1} + \sum_{i=1}^{n} a_{2i} \Delta llfid_{t-1} + \sum_{i=1}^{n} a_{3i} \Delta lstid_{t-1} + \sum_{i=1}^{n} a_{4i} \Delta ltid_{t-1} + a_5 ECT_{t-1} + \mu_t$$

(2)

$$\Delta llfid = b_0 + \sum_{i=1}^{n} b_{1i} llfid_{t-1} + \sum_{i=1}^{n} b_{2i} \Delta lrgdp_{t-1} + \sum_{i=1}^{n} b_{3i} \Delta lstid_{t-1} + \sum_{i=1}^{n} b_{4i} \Delta ltid_{t-1} + b_5 ECT_{t-1} + \varphi_t$$

(3)

$$\Delta lstid = c_0 + \sum_{i=1}^{n} c_{1i} lstid_{t-1} + \sum_{i=1}^{n} c_{2i} \Delta lrgdp_{t-1} + \sum_{i=1}^{n} c_{3i} \Delta llfid_{t-1} + \sum_{i=1}^{n} c_{4i} \Delta ltid_{t-1} + c_5 ECT_{t-1} + \psi_t$$

(4)

$$\Delta ltid = d_0 + \sum_{i=1}^{n} d_{1i} ltid_{t-1} + \sum_{i=1}^{n} d_{2i} \Delta lrgdp_{t-1} + \sum_{i=1}^{n} d_{3i} \Delta llfid_{t-1} + \sum_{i=1}^{n} d_{4i} \Delta lstid_{t-1} + d_5 ECT_{t-1} + \varepsilon_t$$

Where:

lrgdp = logarithm of the per capita real gross domestic product (economic growth) variable
llfid = logarithm of the long term insurance density variable
lstid = logarithm of the short term insurance density variable
ltid= logarithm of the total insurance density variable
ECT_{T-1}= error correction term lagged one period
μ, ε, φ, ψ = mutually uncorrelated white noise residuals

5.2.1 Stationarity tests

The variables were subjected to stationarity tests. These were the Phillips-Perron and Augmented Dickey Fuller tests. The results of the stationarity tests are presented in Table 3. All variables were found to be non-stationary when tested at their levels. They became stationary when differenced once. As such it can be concluded that the variables are integrated and of order one.

5.2.2 Cointegration analysis

Thus having established that all the variables are non-stationary and integrated of order one, we proceed and test for the number of cointegrating relationships by applying the Johansen Test for Cointegration. Cointegrated variables ensure that we eliminate spurious relations and as such share common stochastic trends. Further than that, they enable us to formulate an error correction model as we determine the long-run relationship among the variables. We first estimate an unrestricted VAR and determine the lag length selection criteria. The optimum lag length selected is 5 (Refer to Table 4). We thus then apply the Johansen test using the optimum lag length of 5. The results as presented in Table 5 suggest that there is one cointegrating relationship amongst the variables. The null hypothesis that there is no cointegrating vector is rejected as the trace statistic is greater than the critical value from the Johansen tables. We conclude therefore that there is one cointegrating vector.

5.2.3 Granger causality

Having established that there is at least one cointegrating relationship between the economic growth and insurance sector development variables, we proceed to perform Granger Causality/ Block Exogeneity Wald tests for causality based on the error correction model. The results are reported in Table 6. The results show that there is no causal flow from insurance sector development to economic growth. We fail to reject the null hypothesis of exogeneity of the insurance sector development variables in the economic growth function at the 10% level of significance as all the p-values are greater than 0.10. The results also imply that there is no causal relationship between short-term insurance density and economic growth as well as between short-term insurance density and life insurance density. There is also no causal relationship between total insurance density and short-term insurance density.

However when the dependent variable is long-term insurance density, we reject the null hypothesis of the exogeneity of economic growth variable at the 10% level of significance as the p-value (0.0507) is less than 0.10. However all other variables are exogenous in the long-term insurance function as their p-values are insignificant. Similarly when the dependent variable is total insurance density, we also find that only the economic growth variable is endogenous as its p-value (0.0549) is significant at the 10% level of significance. These results imply that economic growth Granger causes long-term insurance development. Thus the direction of causality runs from economic growth to long-term insurance development without feedback. Further economic growth Granger causes total insurance sector development. The direction of causality thus runs from economic growth to total insurance sector development with no feedback. Short-term insurance sector development is unaffected by economic growth and vice-versa.

Table 3. Stationarity Tests

Variable	Phillips-Perron		Augmented Dickey-Fuller		Order of Integration
	With constant	With constant and trend	With constant	With trend and constant	
LRGDP	0.3262	-3.1439	-0.3595	-3.1781*	I(1)
DLRGDP	-13.7056***	-16.6755***	-2.6323*	-2.6401	I(0)
LLFID	-2.3668	-2.8545	-2.2131	-2.2536	I(1)
DLLFID	-16.1380***	-21.4943***	-13.2318***	-13.2352***	I(0)
LSTID	-4.3232***	-5.6073***	-1.7142	-1.8169	I(1)
DLSTID	-19.1269***	-19.7216***	-10.3627***	-10.3309***	I(0)
LTID	4.4536	2.0369	4.4536	2.0369	I(1)
DLTID	-1.2620*	-2.5551**	-1.4456*	-2.5517*	I(0)

* *represents a stationary variable at 10% level of significance*
** *represents a stationary variable at 5% level of significance*
*** *represents a stationary variable at 1% level of significance*

Table 4. Lag length selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	457.3386	NA	1.27e-11	-13.73753	-13.60483	-13.68510
1	583.3871	232.9987	4.53e-13	-17.07234	-16.40880*	-16.81014
2	600.0825	28.83751	4.46e-13	-17.09341	-15.89905	-16.62146
3	610.9979	17.53082	5.28e-13	-16.93933	-15.21415	-16.25763
4	643.4526	48.19030	3.29e-13	-17.43796	-15.18195	-16.54650
5	**689.3239**	**62.55184***	**1.39e-13***	**-18.34315***	**-15.55632**	**-17.24194***
6	702.2537	16.06426	1.63e-13	-18.25011	-14.93245	-16.93915

Table 5. Cointegration Tests

Rank	Trace Statistic	Trace Critical Value 0.05	Prob	Max-Eigen Statistic	Eigen Critical Value 0.05	Prob
P=0	49.2707**	47.8561	0.0366**	25.0347	27.5843	0.1024
P=1	24.2359	29.7970	0.1906	17.5070	21.1316	0.1494

Table 6. VEC Granger Causality/ Block Exogeneity Wald Tests

Dependent variable: D(LRGDP)			
Excluded	Chi-sq	df	Prob.
D(LSTID)	1.646133	5	0.8956
D(LLFID)	1.947770	5	0.8563
D(LTID)	1.993894	5	0.8500
All	10.14578	15	0.8105
Dependent variable: D(LSTID)			
Excluded	Chi-sq	df	Prob.
D(LRGDP)	2.660649	5	0.7521
D(LLFID)	5.942482	5	0.3119
D(LTID)	5.887166	5	0.3174
All	11.26745	15	0.7334
Dependent variable: D(LLFID)			
Excluded	Chi-sq	df	Prob.
D(LRGDP)	**11.03220**	**5**	**0.0507**
D(LSTID)	7.877828	5	0.1631
D(LTID)	8.245871	5	0.1432
All	19.63650	15	0.1863
Dependent variable: D(LTID)			
Excluded	Chi-sq	df	Prob.
D(LRGDP)	**10.82731**	**5**	**0.0549**
D(LSTID)	7.201212	5	0.2061
D(LLFID)	7.328608	5	0.1973
All	19.96872	15	0.1731

6. Economic and Policy Implications

Our empirical results suggest that economic growth and insurance sector development are cointegrated, that is they move in tandem to each other in the long run. We also wish to highlight two key findings and proffer policy advice. Firstly, we find evidence of one-way Granger causality running from economic growth to the long-term insurance sector in South Africa. This is consistent with the "demand following" insurance-growth hypothesis. We also find evidence of one way Granger causality running from economic growth to the total insurance sector in South Africa. This is also consistent with the "demand following" hypothesis. The policy implication is that the policy makers must put in place policies that will grow the South African economy. With the growth of the South African economy an enhanced demand for insurance services will be created and hence leading to the development of the insurance sector.

The second key finding is that there is no causal relationship between economic growth and the short-term insurance sector. Thus economic growth and the short-term insurance may not mutually influence each other. This is consistent with the "neutrality" insurance-growth hypothesis. The policy implications are that no economic policy might influence the development of the short-term insurance sector. Likewise a short-term insurance policy might be incapable of promoting economic growth.

7. Conclusion

This paper examines the causal relationship between insurance sector development and economic growth in South Africa as understanding the link is critical to policy makers in their quest to grow the economy and regulate the insurance industry. We find evidence that the economic growth spurs the development of the long-term insurance sector as well as the total insurance sector in South Africa. Our findings lend credence to 'demand-following' insurance-growth hypothesis. Further this is also consonant with our *a priori* expectations, that for developing countries, the demand-following hypothesis subsists. As the insurance-growth nexus will continue to preoccupy the minds of researchers, we also suggest that in the future the focus of this research should also turn to the interplay of culture, regulation and the influence of other financial intermediaries.

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