

Finance-Growth Nexus, Insurance Sector and Economic Development

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Abstract

The empirical research of finance-growth nexus has dealt with a vast array of financial depth indicators. In that, banking systems and stock markets seem to be equally important: the scale of both segments of financial system is positively correlated with the dynamics of economic growth. However, it is understood that the development of insurance sector is also a key to high economic growth. Hence, an attempt is made to understand causality between growth in economic development (GDP) and total insurance penetration (TIP) along with bank deposits and stock markets. The paper examines both the long-run and short-run relationship between growth in insurance penetration and economic development in India during the period 2001-2015. Gross domestic product (GDP) is adopted as a proxy for economic development, while Total insurance penetration (TIP) is used to measure growth in insurance as a percentage of GDP. Penetration rate indicates the level of development of insurance sector in a country as it indicates the premium contribution towards various insurance products. The findings revealed that insurance sector growth and development positively and significantly affects economic growth. Using Vector Auto-Regression (VAR) model for testing the Granger causalities, the study finds bi-directional causal relationship (TIP↔GDP) between total insurance penetration and economic development in both long-run & short run. This suggests that insurance sector and economic development can complement and reinforce each other. The study accordingly suggests that both insurance companies and policy makers should work together in order to promote both insurance market and economic growth.

Key Words – Finance-Growth Nexus, Insurance Penetration, Gross Domestic Product, Vector Auto Regression, Granger Causality

1. Introduction

The discourse about finance growth-nexus has been both ambiguous and contentious over the past three decades. Yet there seems to be no straight forward theoretical or empirical framework which is able to succinctly solve the puzzle. Despite such ambiguity, the topic is still central to welfare of human kind and necessary effort is needed to succinctly address the puzzle. It should provide some insights to craft reasonable policy framework in economic growth and development.

Financial development refers to aggregate size of the financial sector, its sectorial composition, and a range of attributes of individual sectors that determine their effectiveness in meeting users' requirements. The evaluation of financial structure should cover the roles of the key institutional players, including the central bank, commercial and merchant banks, saving institutions, development financial institutions, insurance companies, mortgage entities, pension funds, the stock market, and other financial market institutions (IMF, 2005; and Zaman *et al.*, 2012). Most of the financial literature provides wide-coverage on financial sector development, particularly with reference to both banks and stock market development, and its link to economic growth. However, the inclusion of insurance sector in growth enhancing process is having low coverage and has received much less attention than the banking and equity markets (Guo and Huang, 2013; and Lee *et al.*, 2013).

According to the finance-growth nexus theory, financial development promotes economic growth through channels of marginal productivity of capital, efficiency of channeling savings to investment, saving rate and technological innovation (Levine, 1997). Affecting economic growth through these channels is realized by functions of financial intermediaries. Among financial intermediaries, the insurance companies play important role, they are the main risk

management tool for companies and individuals. Through issuing insurance policies, they collect funds and transfer them to deficit economic units for financing real investment. The importance of insurance is growing due to the increasing share of the insurance sector in the aggregate financial sector in almost every developing country.

Theoretical studies and empirical evidence have shown that countries with better developed financial system enjoy faster and more stable long-run growth of which insurance companies contribute to. Well-developed financial markets have a significant positive impact on total factor productivity, which translates into higher long-run development.

By providing protection, insurance companies could affect economic growth through the channels of marginal productivity of capital, technological innovations and savings rate. Insurance companies indemnify the ones who suffer a loss and stabilize the financial position of individuals and firms with possibility of transfer of different kinds of risks to insurance companies. Risk adverse economic units are more induced to buy goods and services, especially those of higher value. In this way, insurance sustains demands or consumptions for goods and services which encourage production and employment which result in multiplier effect on economic growth. Again, firms exposed to various risks of their liability, property, illness and disability of their employees and life of key employees, have the possibility of managing those risks by transfer to insurance companies. This allow firms to concentrate their attention and resources on their core business which can lead to willingness and ability to take real investment which result in higher rate of economic growth.

Furthermore, new demographic situation of prolongation of life expectancy, an increase in elderly people and a falling birth rate and expectation of high level of healthcare and pensions makes big pressure on social security system and could have negative effect on economic growth. But, private insurers could give their contribution in solving the problem of social security system. They provide protection from the financial consequence of illness, injury and retirement. Thus, products such as life and health insurance, can substitute for government security programs. The function of providing insurance coverage could affect economic growth through saving rate channel in a mixed way. On one side, insurance protection contributes to greater security which makes individuals and firms less careful. As a consequence, they could lower their precautionary savings. On the other side, by offering various life insurance products that combine risk protection and saving benefits, insurance companies encourage long term savings.

The asseveration is that, like banking sector development and stock market development, the development of insurance sector is a key to high economic growth (Louberge, 1998; Enz, 2000; Darcy and Gorvett, 2004; and Nektarios, 2010). Development of insurance sector contributes to economic growth in many channels. Two most prominent channels are (Ward and Zurbruegg, 2000; Nektarios, 2010; Omoke, 2011; Hou *et al.*, 2012; Pan *et al.*, 2012; Chen *et al.*, 2012): first, through financial transfers and indemnification activities, insurance services foster and enhance economic growth (Ward and Zurbruegg, 2000); and second, life insurance products encourage long-term saving and the reinvestment of substantial funds in public and private sectors projects (Beck and Webb, 2003), which is again growth-enhancing.

The main objective of this article is to investigate the link between the insurance penetration and economic development in India and hence to fill a gap in the current finance-growth nexus. It is surprising that rigorous and in-depth research of this kind is not more prominent among research topics. Therefore, in this study, we like to investigate the causal relationship between the growth in insurance penetration and economic development. In specific, the investigation is to understand whether insurance penetration causes the economic development or it is merely an outcome of economic development.

2. Review of Literature

Zurbruegg (2000) examines the short and long-run dynamic relationships between economic growth and growth in the insurance industry for nine OECD countries. This was achieved by conducting a co-integration analysis on a unique set of annual data for real GDP and total real premiums issued in each country from 1961-1966. Causality tests were also conducted, which account for long-run trends within the data. The results from the tests suggest that in some countries, the insurance industry Granger cause economic growth and in other countries, the reverse is the case. Moreover, the result indicates that the relationships are country specific and any discussion of whether the insurance industry does not promote economic growth will be dependent on a number of national circumstances.

Beck and Webb (2002) applied a cross-country and time series analysis for the relation between life insurance penetration, density, and percentage in private savings and GDP as the dependent variables, real interest rate, inflation volatility and others as the explanatory variables. Strong evidence was found for GDP, oil dependency ratio, inflation and banking sector development. Inflation, real interest rate, secondary enrolment and private savings were found to be significant. The cross country analysis shows a negative coefficient for a country being of Islamic origin and adds institutional development to the indicators connected positively to insurance demand.

Adams et al. (2005) examined the dynamics and historical relation between banking, insurance and economic growth in Sweden in the period from 1830 to 1998. Insurance development is measured by annual aggregate (non-life and life) insurance premiums. They used time series data and econometric tests of cointegration and granger causality. The results show that the development of banking, but not insurance, preceded economic growth during the nineteenth century, while it was reversed in the twentieth century. Insurance development appears to be driven more by the pace of growth in the economy rather than leading economic development over the entire period of analysis.

Arena (2008) worked on the empirical study and causal relationship between insurance market activity and economic growth which include 56 countries (both developed and developing ones) in the period from 1976 to 2004. Insurance premiums are used as proxies of total life and non-life insurance activities separately. As an estimation method, the author used the generalized method of moment for dynamic models of panel data. The result shows a positive and significant effect of total, life and non-life insurance market activity on economic growth. The author also examined the possibility of nonlinear effect of life and non-life insurance variables on economic growth, but the results did not show the nonlinearity in the relationship.

Marijuana et al. (2009) empirically examined the relationship between insurance sector development and economic growth in 10 transition European Union member countries in the period from 1992 to 2007. Three different insurance variables were used; life, non-life and total insurance and other control variables like education, openness, inflation, investment, bank credit, stock capitalization. According to their findings, insurance sector development positively and significantly affects economic growth. The results are confirmed in terms of life and non-life insurance, as well as total insurance.

3. Data and Methodology

Granger causality analysis is the appropriate technique to investigate the long-run and short-run relationship between insurance penetration and the economic development. In this context, the Granger causality consists of three steps: First, unit root test for the series are undertaken. Second, if they are integrated at order one $I(1)$, the series is detrended. Third, VAR is applied to examine the Granger causality in the short and long run.

To investigate causal relationship between the growth of insurance penetration and economic development, the study used Total Insurance Penetration (TIP) and Growth rate of real per capita income (GDP) respectively. TIP is calculated as the ratio of total insurance premium (both Life and Non-Life) underwritten in a particular year to the percentage of gross domestic product. Penetration rate indicates the level of development of insurance sector in a country as it indicates the premium contribution towards various insurance products. It is understood that the development of insurance sector is a key to high economic growth like banking sector development and stock market development. Considering the same, an attempt is made to understand causality between growth in economic development (GDP) and total insurance penetration (TIP) along with other components of financial sector like bank deposits and stock markets.

The variables are defined in Table-3.1 and the summary statistics of the variables are presented in Table 3.2.

Table-3.1 Definition of Variables	
Variables	Definition
TIP	Total insurance penetration: It includes direct domestic premiums, both life and non-life (in USD) and used as a % of gross domestic product.
GDP	Economic growth: Percentage change in per capita gross domestic product: used as our indicator of economic growth.
BD	Bank Deposits: The growth rate in bank deposits is calculated.
SEN	Sensex: The growth rate in BSE-Sensex is taken as proxy for stock market development.
Note: 1. All monetary measures are in US dollars. 2. TIP is used as a proxy for the insurance sector development. 3. BD is a proxy for banking sector development. 4. SEN is a proxy for stock market development.	
Source: Compiled by the Author	

The annual secondary data ranging from 2001 to 2015 were obtained from the Insurance Regulatory and Development Authority of India (IRDA), World Development Indicators of the World Bank and Sigma Economic Research & Consulting, Switzerland.

Table-3.2 Descriptive statistics

	GDP	TIP	BD	SEN
Mean	5.678868	3.884000	17.29640	5.452733
Median	5.840183	4.028981	17.83810	6.978253
Maximum	6.157661	4.330862	19.13225	25.77576
Minimum	4.334455	2.941517	13.38380	-32.28114
Std. Dev.	0.533604	0.432361	1.762013	15.04626
Skewness	-1.402235	-0.903659	-0.948892	-0.953187
Kurtosis	3.979518	2.722542	2.846960	3.725832
Jarque-Bera	5.515316	2.089612	2.265627	2.600682
Probability	0.063440	0.351760	0.322126	0.272439

Source: Compiled by the Author

The Granger causality test is a statistical hypothesis test for determining whether one time series is useful in forecasting another, first proposed by Granger, C. W. J. (1969). A time series X is said to Granger-cause series Y if it can be shown, usually through a series of t-tests and F-tests on lagged values of X (and with lagged values of Y also included), that those X values provide statistically significant information about future values of Y. We say that a variable X that evolves over time Granger-causes another evolving variable Y if predictions of the value of Y based on its own past values and on the past values of X are better than predictions of Y based only on its own past values.

Granger defined the causality relationship based on two principles:

1. The cause happens prior to its effect.
2. The cause has unique information about the future values of its effect.

Given these two assumptions about causality, Granger proposed to test the following hypothesis for identification of a causal effect of X on Y.

$$Z_t = \alpha + \sum_{i=1}^{\infty} A_i Z_{t-i} + \varepsilon_t \tag{i}$$

Based on the same, the study used the following model to detect the long-run and short-run causal relationship between the economic growth and insurance sector development.

$$GDP_t = \alpha_{11} + \sum_{j=1}^P \beta_{11j} GDP_{t-j} + \sum_{j=1}^P \beta_{12j} TIP_{t-j} + \sum_{j=1}^P \beta_{13j} BD_{t-j} + \sum_{j=1}^P \beta_{14j} SEN_{t-j} + \varepsilon_{1t} \tag{ii}$$

The parameters β_{ij} represent the long-run elasticity estimates of GDP with respect to TIP, BD and SEN. The task was to estimate the parameters in Equation (ii) and conduct panel tests on the causal nexus between the variables. It is postulated that $\beta_{ij} > 0$, which suggests that an increase in total insurance penetration (TIP), bank deposits and stock market activity will likely cause an increase in per capita economic growth (GDP).

Furthermore, the Granger causality test is applied to know the direction of causality between economic development and growth in total insurance penetration. The study used traditional GC model (Granger, 1988) and panel VAR model (Holtz- Eakin *et al.*, 1988; and Arellano and Bond, 1991) for the analysis.

The traditional Augmented Dickey Fuller (ADF; Dickey and Fuller, 1981) unit root is used for the analysis and found that GDP, TIP and BD variables are non-stationary and are detrended by using Hodrick-Prescott algorithm. The detrended variables are considered for the study. The motivation for detrending is to extract a stationary time-series, not to predict the trend.

GDP	TIP	BD	SEN
I(1)*	I(1)*	I(1)*	I(0)*

Note:

1. GDP: Per capita economic growth rate; TIP: Total insurance (both life and non-life) penetration; BD-Growth rate in bank deposits; SEN-Sensex (proxy for stock market growth).
2. The unit root test conclusions are reported on the basis of Augmented Dickey Fuller (ADF) Test statistics.
3. I (0) stand for Integrated of order zero implying there is no unit root.
4. I (1) stand for Integrated of order one.
5. *: Indicates significance at the 5% level.

Source: Compiled by the Author

4. Empirical Results

The Granger causality tests are used to examine the causal nexus between insurance sector development and economic development (GDP). Insurance sector development is represented by total insurance penetration (TIP). The growth rate in Bank deposits (BD) and Sensex (SEN) are considered based on the finance-growth nexus theory. The explanation of these variables is available in Table 3.1. A necessary step for Granger causality test is to check for the stationarity of the time series. Using ADF unit root test for each variable, we reject the null hypothesis of unit root (except for Sensex) at the first difference but not for the levels (see Table-3.3). It indicates that the variables representing economic growth, insurance sector and banking sector development are non-stationary at the level data but are stationary at the first difference. Hence these series are detrended by using Hodrick-Prescott algorithm.

The next step is to determine the direction of causality between growth in insurance sector and economic development, the variables of interest being TIP for growth in insurance sector and GDP for the economic development. Using Granger causality test, the estimated results for these variables are reported in Tables-4.1 and 4.2.

Table-4.1 Results of Test from the Vector Auto Regression Model for Long-Run Causality		
Dependent Variable (GDP)		
TIP	BD	SEN
Y [Y]	Y [Y]	N [N]
<p>Note:</p> <ol style="list-style-type: none"> 1. GDP: Per capita economic growth rate; TIP: Total insurance (both life and non-life) penetration; BD-Growth rate in bank deposits; SEN-Sensex (proxy for stock market growth). 2. The conclusions are drawn on the basis of significance of the lagged error correction term. 3. Y: Yes, indicates the presence of long-run equilibrium relationship; N: No, indicates the absence of long-run equilibrium relationship. 4. []: indicates the presence (Y) / absence (N) of reverse causality between GDP and TIP / BD / SEN. 5. Testing is conducted at the 5% level of significance. 		
Source: Compiled by the Author		

Table-4.1 reports the presence of long-run equilibrium relationship, while Table-4.2 reports the short-run causal links between the two sets of variables. Coming to long-run equilibrium relationship, we find the presence of Granger causality from development of insurance sector (TIP) to economic growth (GDP) and vice-versa. We have similar experience in the context of short-run Granger causality. The results of this section are presented as follows.

Table-4.2 Granger Causality Test Results for the Short-Run		
GDP vs. TIP	GDP vs. BD	GDP vs. SEN
GDP↔TIP	GDP↔BD	GDP≠SEN
<p>Note:</p> <ol style="list-style-type: none"> 1. GDP: Per capita economic growth rate; TIP: Total insurance (both life and non-life) penetration; BD-Growth rate in bank deposits; SEN-Sensex (proxy for stock market growth). 2. GDP←Y: Presence of unidirectional causality from Y to economic growth; GDP→Y: Presence of unidirectional causality from economic growth to Y; GDP↔Y: Presence of bidirectional causality between economic growth & Y; and GDP≠Y: Absence of Granger causality between economic growth & Y. 3. Y = TIP / BD / SEN, where TIP is an indicator for the insurance sector development, BD for bank deposits and SEN represents growth in stock market. 4. Testing is conducted at the 5% level of significance. 		
Source: Compiled by the Author		

5. Conclusion

There is bidirectional causality (TIP↔GDP) between total insurance penetration and economic development. This suggests that the economic growth and insurance sector development can complement and reinforce each other, making development of insurance sector and real economic growth mutually causal. That is the situation where both are self-reinforcing and

subject to the support of feedback hypothesis of finance-growth nexus. Similarly, there is bidirectional causality (BD↔GDP) between bank deposits and economic development implying that the banking sector and economic development reinforce each other. However, there is no causality between the growth in stock market and economic development.

The study accordingly suggests that in order to promote economic growth, attention must be paid to policies that promote the development of insurance sector. This, in turn, requires efficient allocation of financial resources combined with sound regulation of insurance sector. Furthermore, an establishment of a well-developed financial system, including the well functioning of financial institutions, particularly with reference to insurance sector can facilitate further investment and easier means of raising capital to support the economic activities in the economy. Given the possibility of reverse causality or bidirectional causality for some occasions, policies that increase economic growth (such as actions to fuel investment) would be desirable to bring the development of insurance sector. Therefore, what is suggestive is that both insurance companies and policy makers should work together in order to promote both insurance market development and economic growth (Adams *et al.*, 2009; and Teresa and Garcia, 2012). Both legal and regulatory environment does matter for the development of insurance market (Ward and Zurbruegg, 2000; Chang and Lee, 2012; Dragos and Dragos, 2013). Micro-insurance that is environment friendly, meaningful, relevant and affordable for different people should be designed so that insurance will take its rightful place and generate funds for economic development. Therefore, government should pay serious attention to bring these stable environments in order to promote the link between development of insurance sector and the economic growth.

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