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CONTENTS

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INTRODUCTION

REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

SCOPE FOR FURTHER RESEARCH

ACKNOWLEDGMENTS

REFERENCES

APPENDIX/ANNEXURE

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- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

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INSURANCE MARKET DEVELOPMENT AND ECONOMIC GROWTH IN ETHIOPIA

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ABSTRACT

It has been noted that insurance market not only facilitates economic transactions through risk transfer and indemnification but also, it promotes financial intermediation (Ward and Zurbruegg, 2000; Skipper, 2001). Hence, the growth of insurance sector is indispensable for economic growth of nations (Arestis and Demetriades, 1997). However, existing empirical studies on the relationship between insurance market development and economic growth gave mixed evidences, rely on aggregate data to measure insurance market development and hence, neglecting the different market forces to be considered in disaggregation and carried out mostly in developed countries while, evidences on the developing countries, like Ethiopia, are very limited. The objective of this study is hence to examine the relationship between the insurance market development (measured based on aggregate and disaggregated -components of insurance premium) and economic growth in Ethiopia. Based on the data collected over the period of 1996 to 2011, estimation has been made using time series econometric model. Specific procedures followed here in estimation include stationery tests of the time series, co-integration test using the Johansen procedures and causality test. The co-integration test result revealed the existence of long run relationship between insurance market development measured both as aggregate and disaggregated insurance premium and economic growth. The causality test result showed the existing long run and short run relationship between insurance market development and GDP growth, in line with demand following hypothesis at aggregation and in disaggregation of insurance market.

JEL CLASSIFICATION CODES
C23, E44, G22, O11, O16.

KEYWORDS
Economic Growth, Insurance, Premium.

1. INTRODUCTION

The finance-growth nexus theoretical studies conceived and numerous empirical studies (Gertler, 1988; Pagano, 1993; King and Levine,1993; Levine, 1999; Levine and Zervos, 1998; Beck and Levine, 2004) posited that nations with better developed financial systems able to ensure faster and more stable long run economic growth (Levin,2005; Haiss & Sumegi,2008). The presence of well developed financial system will provide improved financial functions that may influence factor productivity, saving and investment decisions and then, long run economic growth (Levin, 2005; Curack *et al*, 2009).

Hence, the development of insurance industry, which is an important part of the financial system, enhances the provision of key financial functions and expected to influence the economic growth. More specifically, insurance market activity or functions, both as a provider of risk transfer and indemnification and as financial intermediary, may contribute to economic growth in the following ways: (a) mobilizing savings; (b) allowing different risks to be managed more efficiently, thereby encouraging the accumulation of new capital; (c) boosting financial stability; (d) fostering a more efficient allocation of capital(Skipper,1997;2001; Skipper and Kwon,2007; Dorfman,2008; Ward and Zurbruegg ,2000). But still, the contending view in the dichotomy that insurance market development may be the response to the real sector development and demand for financial services of insurance(demand following) may hold (Kugler and Ofoghi, 2005). Over the post financial sector reform period, market development in the insurance sector of Ethiopia has been notable. Hence, this article examines the relationship between the insurance market development and economic growth of Ethiopia.

2. REVIEW OF LITERATURE

Various empirical studies on the relationship between insurance sector and economy growth have been documented. Hence, this section presents the review of major empirical studies that examine the relationship between insurance sector and economic growth in perspectives. Beenstock, Dickinson and Khajuria (1988) apply pooled time series and cross-section analysis on 1970- 1981 data in 12 industrialized countries. In the study, Beenstock *et al* (1988) regress premiums for property liability insurance against GNP, income and interest rate development. They find that premiums are correlated to interest rate and GNP; marginal propensity to insure (short and long-run) rises with income per capita and is always higher in the long run. Outreville (1990)conducts a cross-section analysis on property liability insurance premiums for the years 1983 and 1984 for 55 developing countries onto GDP, insurance price and other macroeconomic figures. The results are similar to Beenstock et al (1988) that found a positive relationship between property liability insurance and GDP and, support the significance of income and financial development. Other explanatory variables don't seem to be important.

Browne & Kim (1993)analyze the factors which may affect life insurance demand for 45 countries for the years 1980 and 1987.Their result shown that income, dependency and social security expenses are positively, inflation is negatively correlated and significant in both years. The religious origin – i.e. being a Muslim country – is always negatively connected to insurance consumption. Outreville (1996)investigates the correlation of life insurance premiums to GDP and other factors for the year 1986 for 48 developing countries. The results of the cross-sectional analysis contradict his former work (Outreville 1990) by showing no significance for real interest rate or financial development (M2/GDP). Only the income elasticity is similar to those found in former works (Beenstock et al, 1988, Outreville, 1990 & Browne & Kim, 1993).

Ward and Zurbruegg(2000) examined the possible relationship between growth in insurance activity, defined as annual total premium written, and economic growth, defined as the annual real GDP, in OECD countries over the period of 1961 to 1996. In testing time series properties of data, Philips-Perron unit root test showed real insurance premium and real GDP were non-stationary in levels but stationary in their first difference. Based on Johansen co-integration trace test, there was no co-integrative relationship for Austria, Switzerland, the UK and the US. For Australia, Canada, France, Italy and Japan the null hypothesis of no co-integration relationship was rejected. They apply bivariate VAR methodology to test for Granger causality. Causality tests from VAR in levels show that the insurance activity leads economic growth in two countries (Canada and Japan), while in the case of Italy there is a bidirectional relationship between insurance and economic activity. However, this relationship was weak for Italy and significant at 90 % confidence interval. Causality tests from the error-correction models show similar results as previous tests. Besides, they concluded that the causal relationships between insurance and economic growth might well vary across countries because of the possible influence of number of country specific factors, such as cultural, regulatory and legal environment, the improvement in financial intermediation and the moral hazard effect in insurance.

Based on the cross country data of 55 developed and developing countries for the period of 1980-1996, Webb, Grace and Skipper (2005) examine whether banks and insurance (life and nonlife insurance individually and collectively) contribute to economic growth by facilitating the efficient allocation of capital. In the study, the insurance variable is measured by average insurance penetration (insurance premiums relative to GDP) of life and non-life insurance respectively. In estimations, firstly, assuming exogenous financial variables, they use OLS estimation method, and found the positive effect of banking development on economic growth, while insurance variables do not enter significantly. Then, assuming endogenous relationship between financial activity and economic growth,

they use an iterated 3SLS simultaneous estimation and found that higher levels of banking and life insurance penetration predict higher rates of economic growth. On the other direction, economic growth affects life insurance penetration while it does not predict banking development. However, they found no link between economic growth and non life insurance in any direction.

In UK, Kugler and Ofoghi (2005) evaluate a long run relationship between development in insurance market size and economic growth by using disaggregated data, of net insurance premium, for long-term insurance that includes yearly and single premium (including life insurance, annuities, individual pensions and other pensions) for the period 1966-2003 and for general business insurance, that includes motor, accident and health, liability, property, pecuniary loss, reinsurance and Marine, Aviation and Transport for the period 1971-2003. Using Johansen's λ_{trace} and λ_{max} co integration tests, they confirmed a long-run relationship between development in insurance market size and economic growth for most of components of insurance markets and at least at 5% level of significance. Besides, their causality tests results show that, for eight out of nine insurance markets (the exception is pecuniary loss insurance), the presence of their long run relationship with economic growth. While in the short run, growth in life (both yearly and single premium), liability and pecuniary loss insurance causes economic growth. Further, there is an evidence of bidirectional causal relationship in the long-run between GDP growth and insurance market size for the three insurance categories, with more powerful causality from economic growth to insurance development than the causality from the other direction.

Haiss and Sumegi (2008) examine the impact of insurance on economic growth, measured by GDP, using the cross country panel data from sample 29 European countries during the period of 1995 to 2005. Taking insurance, as one of the explanatory variables, it is measured by premium income and total net investment of insurance companies. Premium income is split into life and non-life premium income. In estimation, they use OLS on unbalanced panel with unobserved country and time effects and found a positive impact of life insurance on GDP growth in the EU-15 countries, Switzerland, Norway and Iceland, while non-life insurance has a larger impact in Central and Eastern Europe.

The causal relationship between insurance market activity has been examined by Arena(2008) using dynamic models of panel data from 55 countries (including high, middle and low income countries), for the period 1976-2004. Arena(2008) uses data for total and non-life and life insurance premiums in order to assess potentially different effects on economic growth, measured by growth in real GDP per capita, controlling for additional factors that may affect economic growth including private credit, stock market turnover, initial GDP per capita, openness, government consumption, inflation, human capital, and terms of trade changes data. In estimations, the study uses the generalized method of moment for dynamic models of panel data and the results show a positive and significant effect of total, life and non-life insurance market activity on economic growth. However, the research results evidence different impact of life and non-life insurance on economic growth. While life insurance premiums positive effect on economic growth is driven by high-income countries only, non-life insurance premiums effect on economic growth is driven by all countries, although a larger effect is found in high-income countries. Additionally, the study found that life insurance would have a bigger impact on economic growth at low levels of economic development and non-life insurance at middle levels.

Adams et al. (2009) analyze the dynamic historical relation between banking, insurance and economic growth in Sweden using time-series data from 1830 to 1998. Insurance development is measured by annual aggregate (non-life and life) insurance premiums. They use log of annual per capita growth in the rate of real GDP to measure national economic growth, data for the total (central, commercial and savings) annualized amount of real bank lending to the non-bank public on a per capita basis to represent bank credit variable. In the study, they use time-series data and econometric tests for co-integration and Granger causality, considering the sub period and whole period of time series. 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. In India, Wadlamannati (2008) examines the effects of insurance growth and reforms along with other relevant control variables on economic development in the period from 1980 to 2006. Growth of insurance penetration (life, non-life and total) is used as proxies of insurance sector growth. The study applies OLS, co-integration analysis and error correction models. The study confirms positive contribution of insurance sector to economic development and a long run equilibrium relationship between the variables. While the reforms in the insurance sector do not affect economic activity, their growth has positive impact on economic development.

In general, as it is evidenced in the previous studies, the dichotomy view still works regarding the role of insurance sector in facilitating long run economic growth (Outreville, 1990; Browne, Chung and Frees, 2000; Beck and Webb, 2003), on the one hand, and the effect of economic growth in achieving insurance sector development(Ward and Zurbruegg, 2000; Webb, Grace and Skipper, 2002; Kugler and Ofoghi, 2005; Vadlamannati, 2008; Arena, 2008; Adams et al., 2009),on the other hand. Besides, the results of past empirical studies are mixed and, mostly past empirical studies use the aggregate total insurance premium that may fail to take into account the different market forces in disaggregation. Further, existing studies on the insurance-growth nexus is mainly focused in developed countries and less evidences documented in least developing countries like Ethiopia.

3. IMPORTANCE OF THE STUDY

This study investigates the relationship between insurance market development, using both aggregated and disaggregated data, and economic growth of Ethiopia in order to contribute to fill a gap in the finance-growth nexus literatures and to the policy makers who seek a better understanding of whether economic growth leads insurance market development('demand following') or insurance market development leads economic growth('supply leading') or bidirectional relationship exist in the insurance-growth nexus in Ethiopia. Evidence about the relationship of insurance sector and economic growth will also influence the priority that policy makers attach to reforming financial sector policies in general, insurance industry, in particular, in the efforts towards economic growth and system stability(Haiss & Sumegi,2008).

4. STATEMENT OF THE PROBLEM

Despite the importance of insurance sector to the economic growth, the empirical studies that investigate the relationship between insurance sector development and economic growth are unparallel with the plethora of studies on the relationship between banking sector development and economic growth (Haiss and Sumegi,2008). Besides, the existing limited empirical studies on the relationship of insurance industry growth and economic growth (Outreville, 1990; Browne, Chung and Frees, 2000; Beck and Webb, 2003; Ward and Zurbruegg, 2000; Webb, Grace and Skipper, 2002; Kugler and Ofoghi, 2005; Vadlamannati, 2008; Arena, 2008; Adams et al., 2009) provide inconclusive, mixed results. Moreover, these studies investigate the relationship mainly based on the use of aggregate total insurance premium (Ward and Zurbruegg, 2000), ignoring possible differences of relations in disaggregation of insurance premium variable, or use of the property-liability insurance premium (Beenstock et al, 1988; Outreville, 1990) as indicator of insurance sector activities or market size, ignoring other activities or markets of insurance industry. Further, available studies on the link between insurance sector and economic growth (Ward and Zurbruegg, 2000; Webb, Grace and Skipper, 2002; Kugler and Ofoghi, 2005; Vadlamannati, 2008; Arena, 2008; Adams et al., 2009) are based on data available in developed and developing economies, excluding least developing countries like Ethiopia. Over the post financial sector reform period, insurance sector in Ethiopia has shown notable expansions and development (NBE, 2010/11). But, as to my knowledge, the relationship between the insurance market development and the recorded economic growth of Ethiopia has not yet examined.

5. OBJECTIVE OF THE STUDY

The objective of the study is to investigate the relationship between insurance market development, using both aggregated and disaggregated data of insurance premium, and economic growth of Ethiopia over the period of 1996 to 2011.

6. HYPOTHESIS

H_o : ***Insurance market development has no relationship with the economic growth of Ethiopia***

7. RESEARCH METHODOLOGY

7.1. DATA AND VARIABLES

In order to examine the relationship between insurance market development and economic growth, the study has set variables to be used. In the study, the variables of interests are the economic growth and insurance market development.

Economic growth- Following previous studies (Ward and Zurbruegg, 2000; Kugler and Ofoghi, 2005), the study uses log of annual growth rate real GDP, as a measure that depictseconomic growth.

Insurance market development- As insurers collect premiums for their risk transfer and indemnification services, insurance premiums are used as a standard measure of insurance market development in insurance literature. However, previous studies use total premiums (Ward and Zurbruegg, 2000; Adams et al., 2009) while others use disaggregated data for life and non-life insurance (Webb, Grace and Skipper, 2002; Haiss and Sumegi, 2008; Arena, 2008) and disaggregated data for life and components of non-life insurance (Kugler and Ofoghi, 2005). As the different insurance policies offer different protection services to the insured, their effect to economic growth might be different and hence, by using total insurance premiums we may fail to account for different market forces in each parts of insurance industry. Hence, the study use log of the annual gross insurance premium as a measure that depicts insurance market development, at different level of aggregation and disaggregation of data. Specifically, the study uses the aggregate annual gross total insurance premium to capture the insurance market development of Ethiopia as a whole. Then, the insurance market development is considered at the disaggregated level of annual gross non life (general) insurance and life insurance premium. This disaggregation is based on the facts that life and non-life insurance policies offer different protection services to the insured. While ***life insurance*** offers medium and long-term protection products with savings elements, ***non-life insurance*** offers medium and short-term indemnification products. Thus, use of this disaggregated measure of insurance market development helps to take into account different market forces in life and non life insurance market and hence, possibly affect economic growth differently (Browne and Kim, 1993).

But still, further disaggregation of non life (general) insurance premium is considered, as the nonlife insurance market encompasses insurance markets of Motor, Accident and health, liability, property, pecuniary loss, Marin, Aviation, engineering, workmen's compensation and others. ***Motor insurance*** policies cover the legal liabilities arising from the use of a motor vehicle(including Private car, motorcycle, commercial vehicles and fleets) and also cover damage to the vehicle(in comprehensive policies).***Liability insurance*** covers legal responsibility for causing loss to someone else by injuring them or damaging their property.***Property (Fire) insurance*** cover specified property that may be damaged or destroyed by events or peril of fire. ***Accident and Health***covers personal accident insurance (policies that will pay in the event of accidental death or a specified injury) and medical expenses insurance (policies that will pay the costs of treatment for acute conditions). ***Pecuniary Loss*** relates to financial losses that may have occurred, e.g. Consequential Loss Indemnity policies. ***Marine insurance and Aviation insurance***covers damage to both the hull and cargo of ships and airplane respectively, along with the liability for property damage, injury and death to passengers and others. Indemnities are also provided for the goods that may be lost or damaged whilst in transit. ***Engineering-*** covers losses made to someone else or damage of the property in relation with engineering activities. ***Workmen's compensation***- pays for any worker who sustains death or bodily injury by an accident or disease arising from working of insured employer. Hence, the insurance market development is also measured by using the log of yearly gross insurance premiums of components of non life insurance (Motor, Accident and health, liability, property(fire), pecuniary loss, Marin, Aviation, Engineering, Workmen's compensation). Data series on all variables are used in the natural logarithm transformation in estimations.

Data for annual insurance premium collected from the audited annual reports of insurance companies in Ethiopia. For checking data consistency, data on insurance premium are also collected from reports of insurance companies available in the National Bank of Ethiopia. These data are available on an annual basis and cover period 1996 to 2011 for all insurance companies in Ethiopia. Data for GDP comes from the Ministry of Finance and Economic development (MoFED) of Ethiopia and World Bank data set.

7.2. ECONOMETERIC MODEL ESTIMATION PROCEDURES

In estimations of time series econometric models, the study begins by testing the properties of the stochastic time series data generating process (which may be stationary or non stationary). Stationary time series exist when it has time invariant mean, variance and auto covariance (at various lags), on the contrary, non stationary time series, otherwise (Gujarti, 2004; Green,2004). Testing for the presence of stationary time series is particularly important for the very reasons that non stationary time series may result in meaningless spurious regression, shocks of the system are persistent and the standard assumptions of asymptotic analysis will not be valid(Gujarti,2004;Brook,2008). Hence, the study use two unit root tests: the augmented Dickey–Fuller (ADF) test and, Philips and Perron (PP) test. Both the ADF test and the non parametric PP test will test the null hypothesis of unit roots against the alternative of stationary by comparing test results and the critical value from tau distribution.

Based the result on the unit root tests, the next step in estimating the time series econometric model is to carry out co-integration tests of variables found to be non-stationary in levels[1]. Variables are said to be co-integrated when a linear combination of two(more) non stationary time series in levels with same order of integration is stationary or integrated of order zero(Green,2004;Gujaritie,2004). The economic implication of the co-integration in estimations shows the existing long run relationship between variables which are co-integrated (Wooldridge, 2000; Gujarati, 2004).In econometric literature, the most common co-integration tests are the Engle Granger and Johnson co-integration tests. The Engel –Granger test is a two step co-integration test procedure proposed by Engel-Granger (1987) and addresses the issue of integrating the short-run dynamics with the long run equilibrium between two variables. However, this test has been criticized as it makes use of residuals of static model that is susceptible to spurious relation and its implicit assumption of only one co-integrating vector. Hence, the study is based on the Johnson co-integration test. Johansen presented the likelihood methods for the analysis of co-integration in VAR models. In this method, the test for the number of the co-integrating vector can be obtained using the following two test statistics:

- ***Trace statistics*** $=\lambda_{trace(r)} = -T\sum_{i=r+1}^{n} ln\,(1-\hat{\lambda})$**(1)**
- ***The Maximum Eigen values*** $= \lambda_{max}(r,r+1) = -T\,ln\,(1-\hat{\lambda}r+1)$**(2)**

Where, $\hat{\lambda}_i$ are the estimated values of the characteristic roots (or Eigen values). Trace statistics (TS) tests the null hypothesis that the number of distinct co-integrating vectors is less than or equal to *r* against alternative. The Maximum Eigen value (ME) statistic tests the null hypothesis that the number of the co-integrating vectors is *r* against the alternative of *r+1* co-integrating vectors. However, the result of this co-integration test tends to be sensitive to the order of the VAR model. Hence, the proper choice of lag length for the VAR is critical and selection of lag length be made to the length that gives the smallest of various information criteria (Akaike information criterion (AIC), Schwarz Bayesian information criterion (SBIC), and Hannan- Quinn information criterion (HQIC)). But when difference arises between or among the tests, the study uses AIC as lag length selections for the simple reason that it gives the smallest information criterion compared to others.

Finally, the study tests the causal relationship between insurance sector development and economic growth. The Granger causality test of the study depends on the results of unit root test and co-integration tests of time series variables. If the unit root test result reveals the presence of stationary variables in levels then by applying VAR in levels causality test can obtained. Alternatively, if the variables found to be non stationary in levels in unit root test but failed to reject the null hypothesis of no co-integration then by applying VAR in first difference causality test can be obtained. In the presence of non stationary variables in level in unit root tests and these variables are co-integrated; the causality test is to be worked with the error correction model (ECM). Because co-integration test is used to find evidence for long- run relationship and Granger's causality test is concerned with short-run relationship, we can consider both of these different concepts in an error correction model (Maddala and Kim, 1998 cited in Kugler and Ofoghi,2005). Besides, inclusion of error correction term in modeling co-integrated unit root processes is important for proper specification of models under which causality testing can lead to erroneous conclusions. Hence, for the possible presence of non-stationary co-integrated variables, following Kugler and Ofoghi (2005) approach for causality test, the Granger equations are re-parameterized to achieve VECM equations as follows:-

[1]There are no co-integration tests to be made for variables found to be integrated of order zero in levels.

$\Delta y_{1t} = q1 + g_{11}(L)\,\Delta y_{1t-1} + g_{12}(L)\Delta y_{2t-1} + \alpha_1 ECM_{t-1} + \varepsilon_{1t}$ (3)

$\Delta y_{2t} = q2 + g21(L)\,\Delta y_{1t-1} + g22(L)\Delta y_{2t-1} + \alpha_2 ECM_{t-1} + \varepsilon_{2t}$ (4)

Based on the equations above, there are two sources of causal relationship between variables, either through lagged dynamic terms (Short-Run), or through the lagged co-integrating vector (Long-Run). In addition, joint significance of both short-run and long-run can be tested. In each case, null hypothesis of no-causal relationship can be tested using the significance of p-values of the estimated coefficients (g_{12}, $g2$,α_1, α_2).

8. RESULTS

To test the data generating process of time series, two unit root tests are used in the study. In the augmented Dickey-Fuller (ADF), the lag length is determined by sequentially testing down starting from a general model with *k* max lags and tests whether of the coefficients of the last lags are significant and repeat the procedure until a rejection occurs or the sequential testing leads to the boundary zero(Green,2004). The max lags to be considered for sequential testing is determined based on Schwert criteria (Green, 2004). In Phillips and Perron (PP) unit root test, the study used the Newey and West (1994) to determine the lags length. This method indicated to be useful as it show how to select the band width optimally when the form of autocorrelation was unknown. The results of the ADF and PP unit root tests of time series variables in levels and first difference found to be as shown below in Table 8. 1.

TABLE 8.1: UNIT ROOT TEST

Variable	Unit root test on levels		Unit root test on first difference	
	ADF	PP	ADF	PP
Real GDP growth	-1.900	-2.519	-7.159 ***	-3.336*
Total insurance premium	-1.540	0.097	-5.126***	-2.308
Life insurance premium	-2.433	-1.262	-3.961***	-3.872***
Nonlife insurance premium	-1.497	0.089	-4.599***	-2.703
Motor insurance premium	-0.788	0.175	-3.899**	-2.241
Liability insurance premium	-2.874	-1.861	-2.632	-3.697**
Aviation insurance premium	-1.784	-2.097	-2.399	-3.550*
Engineering insurance premium	-1.976	-2.369	-3.396***	-3.053
Fire insurance premium	-3.161	-1.794	-0.827	-3.936**
Marine Insurance premium	-2.014	-1.863	-2.992	-4.679***
Accident and Health insurance premium	-2.094	-3.463*	-2.508	-5.093***
Pecuniary insurance premium	-1.003	-0.489	3.284 *	-4.127**
Workmen's compensation premium	-1.095	-1.226	-1.869	-4.317**

Note: *,**and*** indicates test statistic is significant at the 10%, 5% and 1% level.

Lag length selection is based on sequential testing for augmented Dickey-Fuller and the Newey and West (1994) for Philips Perron unit root tests. All regressions include a constant and linear time trend.

The unit root tests on levels of time series variables indicate that the null hypothesis of unit root cannot be rejected in both ADF and PP tests. Both the ADF and PP tests failed to reject the null hypothesis of unit root in Real GDP variable in level, while, both tests reject the null hypothesis of unit root in Real GDP variable in first difference. Hence, the real GDP growth variable is non stationary in level and stationary in the first difference.

Both the ADF and PP unit root tests consistently failed to reject the null hypothesis of unit root in insurance market development proxies (variables) in level at both the aggregate and disaggregate gross insurance premium, except the accident and health insurance that in ADF test, the null hypothesis can't be rejected but PP test shows the rejection of the null hypothesis of unit root. Thus, the unit test result revealed the existing non-stationary, in level, time series variables of insurance market development proxies at different level of aggregation and disaggregation, except the accident and health insurance premium found to be stationary in PP test. On the contrary, the PP unit root test in first difference, though conflicting with the result of ADF test, rejects the null hypothesis of unit roots in all variables considered, except total insurance, non life insurance and motor insurance premium variables considered.

Based on the all of the non stationary variables in levels characterized as being integrated of same order found in the unit root tests, one can evaluate the long run relationship between insurance premium, measured at different level of aggregations and disaggregation and real GDP using co-integration test. The study used Johansen's procedure to find whether there exists a co-integration in non stationary variables in VAR model. However, the co-integration of variables is highly sensitive to the lag length. Hence, firstly, the study selects the appropriate lag length based on information criteria, while consideration given to the over consumption of degrees of freedom. Then, at the chosen lag length 2, tests of trace statistics (TS) and the maximum Eigen value (ME) used to examine the number of co-integrating relationships are estimated as shown in Table 8.2.

TABLE 8.2: BI-VARIATE CO-INTEGRATION TEST

Variable	Johnson I_{Trace}	Johnson I_{Max}
	H_0:r=0	H_0:r=0
Total insurance premium	20.6897***	11.8302
Life insurance premium	24.6570***	22.7073***
Nonlife insurance premium	22.4506***	13.6574
Motor insurance premium	15.4728**	12.0822
Liability insurance premium	14.6087	14.1142**
Aviation insurance premium	9.2981	7.0335
Engineering insurance premium	19.8568**	18.3429**
Fire insurance premium	41.1931***	32.1275***
Marine Insurance premium	16.9467**	13.2066
Accident and Health insurance premium	29.8537***	29.8424***
Pecuniary insurance premium	14.7619	13.8262
Workmen's compensation premium	19.6109**	16.4607**

Note : *,** and *** indicates test statistic is significant at the 10%, 5% and 1% level. Lag length selection as suggested by information criteria. All regressions include a constant and linear time trend.

As there is bi-variate VARs, taking one insurance development variable at a time, measured at different levels of aggregation and disaggregation with GDP growth, for co-integration test, the maximum possible number of co-integrating vector is 1. Hence, the study tests the null hypothesis of no co-integrating vector and the alternative hypothesis of presence of one co-integrating vector. In testing the null hypothesis, comparison of the TS and ME statistics values with their respective t-statistic values has been made. As the co-integration tests results shown above, the TS and ME values exceed the t-statistics and hence, consistently rejects the null hypothesis of no co-integration (r = 0) between real GDP growth and insurance market development, measured at levels of Life insurance and sub components of non insurance (Engineering insurance, fire insurance, accident and health insurance, workmen's compensation insurance and life insurance) at 5% and 1% significant level. While, the TS test indicate the rejection of the null hypothesis of no co-integration of GDP growth and insurance market development, measured at levels of total insurance, nonlife insurance, motor insurance and marine insurance market at 5%, the ME test failed to reject the null hypothesis absence of co-integration between these time series . On the other way round, the ME test reject the null hypothesis of no co-integration between liability insurance and real GDP growth at 5% significance level, but, the TS tests failed to reject the absence of co-integration of these time series. However, both TS and ME tests consistently failed to reject the null hypothesis of no co-integration between real GDP growth and remaining insurance market development, measured at levels of aviation insurance and pecuniary insurance market. The existence of co-integration in ten out of twelve proxies of insurance development measured at different levels of aggregation and disaggregation indicate the existing long run relationship between variables in the vector.

Based on the unit root test results and co-integration test results, the study investigates the causality test based on the VAR models. If the variables are non stationary in levels and found to be co-integrated in their linear combinations, the causality test is to be made based on the vector error correction model (VECM). Hence, from the unit root test and co-integration test results, insurance market development measured at levels of total insurance market premium, life insurance premium, non life insurance premium and components of non-life insurance premium (specifically, motor insurance, engineering, fire, marine, accident and health, workmen's compensation and liability insurance premiums) found to be non-stationary series and co-integrated with the real GDP, the study used the VECM for testing the null hypothesis of no causal relationship, from these insurance market development to GDP or vice versa, in the short run and long run, as shown in Table 4.3. For the variables found be non stationary in levels in unit root tests but not co-integrated, the causality test can be made based on estimating the VAR in first differences. Thus, from unit root and co-integration test results, insurance market development, measured at levels of aviation insurance and pecuniary insurance premiums are non-stationary variables in levels but not co-integrated with the real GDP growth, the study use the VAR in first difference for the null hypothesis of no causal relationship for short run has been estimated and tested, appropriately, as shown below in Table 8.3.

TABLE 8.3: CAUSALITY TEST

Variable	GDP doesn't cause insurance premium							Insurance premium doesn't cause GDP					
		Coef.	Std.err	z	P>z	χ^2	P-val	Coef.	Std.err	z	P>z	χ^2	P-val
Total insurance	g_{12} ,g_2 α_1, α_2	-16.02315 .0678456	9.336638 .021099	-1.72 3.22	0.086 0.001	120.01	0.000	-.02345 .42917	.0225922 .4825063	-1.04 0.89	0.299 0.374	4.314	0.365
Life insurance	g_{12} ,g_{21} α_1, α_2	-.04217 .10718	.0185992 .025406	-2.27 4.22	0.023 0.000	207.24	0.000	.1627749 -.884107	8.293124 .6309687	0.02 -1.40	0.984 0.161	4.425	0.352
Non life insurance	g_{12} ,g_{21} α_1, α_2	-.0398139 .0909179	.0214616 .0218181	-1.86 4.17	0.064 0.000	144.47	0.000	-7.6946 .04544	9.685884 .6211937	-0.79 0.07	0.427 0.942	2.013	0.733
Motor Insurance	g_{12} ,g_{21} α_1, α_2	-.0286533 .0364973	.0221418 .0271067	-1.29 1.35	0.196 0.178	66.433	0.000	9.654872 -1.05432	5.306034 .4271154	1.82 -2.47	0.069 0.014	6.827	0.145
Engineering Insuranc	g_{12} ,$g_{21}\alpha_1$, α_2	-.2897921 .459168	.1497042 .1348992	-1.94 3.40	0.053 0.001	19.73	0.001	2.147506 -1.32446	.7779544 .2766573	2.76 -4.79	0.006 0.000	30.76	0.000
Fire insurance	g_{12} ,g_{21} α_1, α_2	-.011405 .0104163	.0038762 .0012552	-2.94 8.30	0.003 0.000	90.13	0.000	49.89473 -.224292	23.84318 .115817	2.09 -1.94	0.036 0.053	4.776	0.311
Marine Insurance	g_{12} ,g_{21} α_1, α_2	.0123509 .0153778	.0383335 .050659	0.32 0.30	0.747 0.761	28.19	0.000	5.604634 -1.46535	3.039033 .365199	1.84 -4.01	0.065 0.000	19.02	0.001
Accid & Health Ins.	g_{12} ,$g_{21}\alpha_1$, α_2	-.1207567 .1051531	.0388367 .0519009	-3.11 2.03	0.002 0.043	35.40	0.000	-1.19734 -1.33232	1.923881 .4382333	-0.62 -3.04	0.534 0.002	9.82	0.043
Workmen'comp. Ins.	g_{12} ,$g_{21}\alpha_1$, α_2	-.0516279 .0412436	.0209294 .0263524	-2.47 1.57	0.014 0.118	44.53	0.000	1.58071 -1.07667	5.244725 .478299	0.30 -2.25	0.763 0.024	5.51	0.238
Liability insurance	g_{12} ,g_{21} α_1, α_2	.0087708 .0234298	.0941625 .1237885	0.09 0.19	0.926 0.850	13.281	0.010	-2.44714 -1.34345	1.00093 .315469	-2.44 -4.26	0.014 0.000	23.553	0.0001
Aviation insurance	g_{12} ,g_{21}	.0120941	.2895105	0.04	0.967	.5265	0.971	-.4456528	.6740795	-0.66	0.509	2.427	0.658
Pecuniary insurance	g_{12} ,g_{21}	.1655381	.1060244	1.56	0.118	2.823	0.588	-1.281266	1.675063	-0.76	0.444	3.788	0.436

Note: g_{12} ,$g_{21}$are coefficients of lagged dynamic terms (Short run) in differenced eqs. of each insurance premium and GDP growth respectively

α_1, α_2 are coefficients of lagged co-integrated vector (Long run) in differenced eqs. of each insurance premium and GDP growth respectively

The causality test is based on the significance of the coefficients of lagged co-integrating vector (α_1, α_2) and the lagged dynamic terms(g_{12} ,g_{21}) in the estimation of VECM. As shown in estimation result, the coefficient of lagged co-integrating vector and lagged dynamic terms in differenced equations of total insurance premium, life insurance premium and non-life insurance premium found to be significant. But, the coefficients found to be, consistently, insignificant in differenced GDP equation. Hence, these test results revealed the presence of unidirectional causality from the GDP growth to insurance market development measured as total insurance premium, life insurance premium and non life insurance premium. Consistently, in using the aggregate total insurance premium and disaggregate life and non life insurance, the study found the existence of both short run and long run causality from real GDP to insurance market development. These evidences confirm the existence of demand following pattern that economic growth leads to the rise in demand of insurance.

However, at the level of disaggregated components of non-life insurance market, the test results indicate the unidirectional causality from insurance market development to real GDP and bidirectional causality. More specifically, the coefficients of lagged co-integrating vector and lagged dynamic terms in differenced equations of real GDP found to be significant but not, in differenced equations of motor insurance premium and marine insurance premium. Hence, there is unidirectional causality from insurance development, measured as motor insurance and marine insurance, to real GDP growth of Ethiopia. The study confirms the existence of short run and long run causality from motor insurance market development and marine insurance market development to real GDP growth. These results confirm the existence of supply leading that growth in insurance smoothes short-term economic volatility and thus, induce economic growth in the long run. On the contrary, consistent with finding in using non-insurance premium, there exists the short run unidirectional causality from the GDP growth to accident and health insurance market development and workmen's compensation insurance market development. Further, the interdependence of economic growth and insurance development was also revealed in the existing evidence of bidirectional causality of GDP growth and, engineering insurance development and fire insurance market development. However, there are no causal links (dependency) found between GDP growth and insurance development measured as aviation insurance and pecuniary insurance premium. In VAR first difference estimation, the χ^2 found to be 0.5265 (p value= 0.971) for the causality from GDP growth to Aviation insurance and the χ^2 found to be 2.427 (p value= 0.658) for the causality from Aviation insurance to GDP growth. Similarly, the χ^2 found to be 2.823 (p value= 0.588) for the causality from GDP growth to Pecuniary insurance and the χ^2 found to be 3.788 (p value= 0.436) for the causality from Pecuniary insurance to GDP growth. These results re-enforces the findings of the co-integration test.

9. CONCLUDING REMARKS

From different financial-growth theoretical studies and empirical studies, it has been noted that a general consensus reached that financial development facilities economic growth. As the part of the financial system, insurance sector development can have an effect on the economy growth through risk transfer and indemnification and also promote financial intermediation. Nevertheless, past studies on the relationship between financial development and economic growth mainly focus on the banking firms and less consideration has been given to the insurance sector. Besides, the existing empirical literatures on the relationship between insurance and economic growth provide mixed evidences, use data of developed countries and neglect data on the least developing countries and, except a few studies which have considered relationship between some parts of insurance industry (disaggregated data) and economic growth, nothing has been done to evaluate this claim empirically, particularly in least developing countries.

In the study, potential relationship between growth in insurance industry and economic growth was examined. In this regard, economic growth measured as the log of annual real GDP growth rate and insurance market development measured at different level of aggregation and disaggregation. In estimating time series econometric model, the unit root test, co-integration tests and causality tests has been carried out. The result showed the existing long run relationship between development in insurance market size and economic growth at all levels of aggregated and disaggregated measures of insurance market size development by using Johansen TS and ME co-integration tests, expect aviation insurance and pecuniary insurance premium. For most of variables, this relationship has been confirmed at least at 5% level of significance. In addition, because co-integration analysis does not provide information about possible patterns (demand-following and supply-leading), the study carried out causality tests. The causality test results reveal the existence of unidirectional causality both in the short run and long run from GDP growth to insurance market development measured at aggregate level using total insurance premium and at disaggregation using life insurance and non-life insurance premium. But, at the level of disaggregated components of non-life insurance market, the test results indicate the unidirectional causality from insurance market development (motor insurance and marine insurance) to real GDP and bidirectional causality (engineering insurance and fire insurance premium).

The existence of unidirectional causality from GDP to total insurance premium, life insurance premium and non life insurance premium imply the structure insurance market of Ethiopia, in aggregate terms, is characterized as working on the demand following hypothesis and hence, aggressive growth enhancing policy should directed to scale up the demand for financial services of the insurance sector of Ethiopia.

The existence of unidirectional causality from Insurance market development, measured at the level of disaggregated data, to GDP growth imply the existence supply leading hypothesis in sub markets of insurance industry of Ethiopia. Hence, policy makers should consider the contribution of growth of insurance market at disaggregate level(motor insurance and marine) to smooth out short run economic volatility and thus, induce economic growth in the long run. The bi-causality between real GDP growth and, engineering insurance market development and fire insurance market development imply the existing interdependence. Hence, the growth enhancing policy in the real sector should also consider the growth of these sub sector insurance market development.

10. LIMITATIONS

The study examines possible relationship between growth in insurance industry and economic growth based on the data obtained in a single country. Hence, the study failed to address and control the effect of conditional factors from cross country variations that may affect how the insurance sector development, at different level of aggregations and disaggregation of insurance market developments, related with the economic growth. Besides, this study is carried out based the relatively short span data points available only over the period of 1996 to 2011. This time periods may limit the conclusiveness of the findings in our time series econometric models estimations.

11. SCOPE FOR FURTHER RESEARCH

In existing gaps regarding the evidences in the insurance nexus growth, the need for further research on the insurance-growth is commanding by using different measures for insurance market developments (such as, insurance penetrations and insurance density, among others), economic growth, model specifications and reasonably longer time periods. Besides, in the future research of insurance market and economic growth, a panel of developing countries need to be considered to capture the effect of conditional factors, which may constitute economic, financial, demographic and regional conditions (Haiss & Sümegi, 2008), to enhance our understanding with respect to the nexus of finance-growth in general, and to the nexus of insurance market development and economic growth,in particular.

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