The Relationship between Life Insurance Demand and Economic Growth in Iran

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Abstract

A well-developed insurance sector, as a financial market is necessary for the economic growth since it provides long-term funds for physical and social infrastructures and strengthens risk-taking abilities. This study aims to examine the existence of a relationship between the growth of life insurance demand and the economic growth in Iran.

Using econometric methodology, the data for the period of 1348-1389 were collected from the Iranian national data center, then by estimating the Vector Autoregressive (VAR) model along with several time series tests such as unit root test, co-integration test, granger causality test, impulse response function & variance decomposition of forecast errors, the econometric results indicate that life insurance sector growth contributes positively to economic growth.

Keywords: *life insurance sector growth, economic growth, Vector Autoregressive (VAR) model, Time series.*

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1. Introduction

1.2 The relationship between Insurance Sector and Economic Growth

Among financial intermediaries, insurance companies play an important role in performing the functions of financial system. They are the main risk management tools for companies and individuals. They collect funds by issuing insurance policies, and transfer them to deficit economic units to finance real investment. Therefore, insurance sector could be one of the factors contributing to economic growth.

The importance of the insurance-growth nexus is growing due to the increasing share of the insurance sector in the aggregate financial sector in almost every developing and developed country.

The growing links between the insurance and other financial sectors also emphasize the possible role of insurance companies in economic growth (Rule, 2001).

Insurance companies are similar to banks and capital markets as they serve the needs of business units and private households in financial intermediation. The availability of insurance service is essential for the stability of the economy and can make the business participants accept aggravated risks. By accepting claims, insurance companies also have to pool premiums and form reserve funds. So insurance companies are playing an important role by enhancing internal cash flow and creating large amount of assets placed on the capital market, hence contribution to economic growth.

1.2.1 How the insurance sector fosters economic growth

In the following section, we discuss the various functions performed by the insurance sector and its possible link to economic growth. So we apply a functional perspective, and discuss promoting sensible risk management by firms and households, contributing to sustainable growth, risk transfer, saving substitution, investment and resources accumulation and allocation.

1.2.1.1 Promoting sensible risk management by firms and households, contributing to sustainable growth.

Insurer's risk assessment is reflected in price and policy conditions. In this way, they offer firms and households an indicator of their risk level. The policyholder can take action to reduce the risk profile, or to reduce the potential damage, or both. Therefore, by means of risk pricing, insurance acts as a precaution improver, and encourages responsible and sustainable use of resources; for example: prevention of events at work and less polluting technology. The client will clearly see the advantages of action taken to reduce risk. In some cases this will happen because there will be no insurance if things are left unchanged, at other times this will happen because of a high premium level. This process influences investment decisions, and thus contributes to the sustainable growth and development of the economy and society.

1.2.1.2 Risk Transfer

The major functionality of the insurance on the client side is risk transfer. Usually the insured pays a premium and is secured against a specific uncertainty. By reducing uncertainty and volatility, insurance companies smoothen the economic cycle and reduce the impact of crisis on the micro and aggregate macro level.

1.2.1.3 Saving Substitution

The appearance of insurance companies adds an additional competitor to the financial market, which enables the customer to diversify his portfolio or substitute different investments. Since the indemnification of possible losses is assured by the insurance, the dependence on precautionary savings held by companies or households is reduced. So, offering insurance services can result in an increased consumption of the households and/or may increase market competition and hence market efficiency.

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1.2.1.4 Resources Accumulation and Allocation

In the process of accumulation and allocation of resources, insurance companies lower transaction costs, achieve diversification and lower nonsystematic risk; provide limited liquidity and lower information asymmetry, by which they contribute to economic growth through channels of marginal productivity of capital, saving rate and technological innovation.

2. Literature Review

2.1 Researches of foreign scientists

2.1.1. Theoretical Focus

Holsboer (1999) concentrates on the recent changes in the external environment of insurance companies in Europe. He argues that the change of insurance services importance in the economy is dependent on the growing amount of assets and the increasing competition between the financial sectors, but the author emphasizes the prominent role of the services industry, and denotes insurance sector development as a determinant for economic growth. As population aging and the move from a pay-as-you-go (PAYG) system to privately funded schemes favors the growth of the insurance industry and facilitates capital market development with increasing supply of long-term savings, Holsboer (1999) sees the interaction between the insurance and economic growth as bidirectional.

Ranade & Ahuja (2001), analyze the development of the Indian insurance sector over time under the impact of softening regulatory constraints. In the initial setting, the Indian subcontinent's insurance sector was controlled by the state monopoly, so competition was nonexistent and the price barrier thwarted private households' access to insurance services. Deregulation measures included the abolition of the insurance monopoly, promoting competition, and developing a regulatory framework defining statutes for financial supervision. The new regulatory framework followed the recommendations of McKinnon (1973) and Shaw (1973) to increase savings, improve assets allocation and hence to promote growth. The authors try to

validate the results of the transition by searching for evidence of two estimations which are both part of McKinnons and Shaws theory: (1) an additional accessible financial service for the private households should increase asset allocation, and (2) enhanced competition on the insurance sector is facilitating efficiency.

The main purpose of the model by Das, Davies and Podpiera (2003) is to identify contagious functions and properties of insurance. They further develop new financial soundness indicators for insurance companies by joining their experience gained under the Financial Sector Assessment Program (FSAP), and reviewing the recent failures in the sector. In their model, the insurance role as a risk pass-through mechanism, the asset allocation and the insurer's ability to alter the behaviour of clients and the public contribute to economic growth.

Das et al (2003) argue that (1) financial deregulation and liberalization that allowed bank-type activities, (2) large macroeconomic fluctuations in output and price, and (3) close linkage between banks and insurers could be the main indicators for a possible insurance failure with repercussions to the economy at large.

2.1.2 Empirical focus Studies

Lim & Haberman (2003) concentrate on the Malaysian life insurance market. While the interest rate for savings deposit and price enter significantly in the equation, the positive sign of the interest rate puzzles the authors. This could be in line with findings of Webb et al (2002), who found the best results when insurance and banking sector are combined in the estimates. Price elasticity is found to be more than even.

Boon (2005) investigates the growth supportive role of commercial banks, stock markets and the insurance sector. The author's findings show short and long run causality running from bank loans to GDP, and a bidirectional relationship between capital formation and loans. GDP growth seems to enhance stock market capitalization in the short run, and the market capitalization will be significant when determining the capital formation in the long run. Total insurance funds affect GDP growth in the long and capital formation in the short and the long run.

One of the most recent studies by Haiss and Sümegi (2006) and the Comité Européen des Assurance (CEA) report (2006), beautifully highlight the insurance sector growth and its spillover effects. The study by Haiss and Sümegi (2006) puts the spotlight on the role of the insurance sector and its links to other financial sectors of greater importance. The study reviews the theory and empirical verification, and identifies the various influence channels of the insurance sector on economic growth for a cross-country panel of 29 European countries from 1992 to 2004. The results display a weak relationship between the insurance sector and economic growth. The study of the CEA (2006) deals with the contribution of the insurance sector towards economic growth and employment in the European Union (EU) region. It shows that the European insurance industry strongly believes that it has a positive impact on economic activity, and can help achieve the goals set in the 'Lisbon Agenda'. The report further explains how insurance could help boost growth and employment in EU nations, and outlines the important steps necessary to allow the economy to reap the benefits of a well-developed insurance sector.

Krishna Chaitanya Wadlamannati (2008) considers the insurance sector growth and reforms on economic development in India. This paper also examines the economic growth effects on insurance sector reforms and the rate of growth of insurance reforms. It used time series methods and tests like Granger causality and VECM to investigate the possible long-run relationship. The result shows that the contribution of the insurance sector to economic development is positive and exhibits a long-run equilibrium relationship. It is also found that reforms exert no strong relationship, but the rate of growth of reforms has a positive influence on economic development. The study therefore, suggests that in order to make the insurance sector a more important component of the financial intermediation process, complete deregulation and increase in the pace of reforms are the need of the hour.

Kok Sook Ching, Mori Kogid, and Fumitaka Furuoka (2010) investigate the causal relation between life insurance fund and economic growth in Malaysia. This study applies the Johansen cointegration test, and the Granger causality test based on the Vector Error Correction Model (VECM) to demonstrate the possible causal relation. The results provide sufficient evidence to support a long-run

relationship between the life insurance indicator (the total assets of Malaysian life insurance sector) and the real GDP, and also a short-run causal relation from the real GDP to the life insurance indicator (the total assets of Malaysian life insurance sector). The findings suggest that the life insurance sector of Malaysia could potentially be an effective financial factor.

2.2. Iranian Researches

There are few studies examining the contribution of the insurance sector to economic growth and development in Iran. Some noteworthy studies have tried to examine the trends in the growth of the sector, like the study of Jafari Samimi, Ahmad. Kardgar, Ebrahim (2005). They investigate the causal relation between insurance development and economic growth in Iranian economy in the years 1338-1382 with an empirical view. They apply different tests about stationary and cointegration of variables to determine the causality model (Error Correction Model). Empirical results of this study confirm the existence of causal relationship between life insurance and economic growth, but do not confirm this causal relation between non-life insurance and economic growth.

Ofoghi (2008) investigates the relationship between insurance market development and economic growth within the UK. Some previous studies have shown that there is no long-run relationship between insurance development and economic growth in some OECD countries, including the UK. Those studies considered insurance markets as a whole. As it is possible to observe no cointegration at the aggregate level and cointegration at the disaggregated level and vice versa, this study reassessed the conclusions using disaggregate data of insurance markets, and found a long-run relationship between insurance market development and economic growth. On the basis of a causality test, it was concluded that the structure of the UK's insurance industry tends to display a demand-following pattern rather than a supply-leading one (i.e. growth promotes insurance market development, but not vice versa).

Soltani, Hamed (2010) explores the relationship between the growth of insurance industry and economic development in the selected developing countries (Algeria, Malaysia, Indonesia, Pakistan, Turkey, Philippine, Egypt, India) and compares them to between Iran

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in the period of 1976-2009. This study applies econometrics method based on inference analysis and panel data method. On the basis of parameter estimation of the model, they found that all of their variables have positive and meaningful effect on the economy of the mentioned countries.

3. Empirical work

3.1. Research Variables

3.1.1 Dependent Variable

Economic growth is considered to be an important indicator of a country's economic progress. Economic growth is represented in this study by the growth of gross domestic product (GDP) in billion Rials.

Economic growth = Changes in Real GDP in billion Rials

3.1.2 Independent Variables

There are two sets of independent variables. The first set includes the main variables, namely, insurance sector growth; the second set has control variables which include various macroeconomic and financial variables.

3.1.3 Main Explanatory Variables

(a) Life Insurance Sector Growth—The aim is to examine the impact of the life insurance sector on economic growth, so we take the growth of life insurance which is best determined by the growth of the amount of policy premiums paid for life insurance policies. This would be the best indicator available, which acts as a proxy for the growth of the life insurance sector.

Life insurance sector growth = Growth of Life insurance premiums

3.1.4 Control Variables

The control variables used in the models include various macroeconomic and financial indicators. (a) Money Supply: Many studies (such as Husain and Qayyum 2006) have advocated the importance of money supply in the economy which has a major impact on the development of financial markets and economic growth. We presume that an increase in money supply in the economy is positively associated with the dependent variable.

Money supply[1] = M2 that consists of M1 + Time deposits

(b) Inflation: It is argued that a high inflation rate often acts as an obstacle to economic growth & development. We assume that a high inflation rate could have a negative association with both dependent variables unless it is under control, and hence it is included in the models.

Inflation = Rate of growth of Consumer Price Index

(c) Oil income: The currency of dollars that are earned by selling and exporting oil to other countries creates a valuable income for our country, so the oil income has a direct effect on the economic growth of the country. It has a critical effect on both sides of economy i.e. demand side as well as supply side. Any decrease in the oil income of the country causes an increase in the expenses of the imported goods, and this will create a kind of inflation as cost push inflation. Therefore, it acts as an obstacle against economic growth, increases the expenditures of insurance companies, and generates an uncertainty in financial markets.

Oil income = annual income of government from selling unrefined oil, oil products, and in some years natural gas.

1. M1 = Active money, includes notes and coins+ demand deposits, M2 = M1+time deposits+ saving deposits in commercial banks and non-banking cashable saving accounts.

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3.2 Statistical Specification of Variables

Table 1: Statistical specifications

Variables	Statistical specifications					
	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
GDP	528303	25290.50	3851803	575	990726.7	42
Life	225.2267	10.3275	1809.645	0.122	393.4482	42
Money supply	339524.5	20861.4	2948874	205.7	688044.6	42
Inflation	16.95476	15.7	49.4	1.5	8.954961	42
Oil income	50074.67	2577.25	434485.5	70.1	88141.03	42

3.3 Unit Root Test

Most of the time series variables are non-stationary, and using non stationary variables in models might lead to spurious regressions (Granger 1969). The first or second differenced terms of most variables will usually be stationary (Ramanathan 1992). Thus, the first step involves performing the Dickey–Fuller (DF) Unit Root Test and, based on the results, conducting the Augmented Dickey–Fuller (ADF) test.

According to the above explanation, this test was done by using Eviews7 software and the results are as shown in table 4-2.

Table 2: Results about DF, ADF tests for natural logarithm of time series data

Model	Intercept				Intercept and linear trend			
lag order	Level		1st difference		level		1st difference	
Test result / variables	Test statistic Value	Test critical value	Test statistic Value	Test critical value	Test statistic value	Test critical value	Test statistic value	Test critical value
GDP	0.009737	-2.935001	-4.940863	-2.936942	-1.336991	-3.523623	-4.899173	-3.526609
Life	-0.399394	-2.936942	-9.714134	-2.936942	-4.142892	-3.523623	-9.582537	-3.526609
Money supply	-0.457066	-2.935001	-7.015753	-2.936942	-1.432865	-3.526609	-6.908247	-3.526609
Inflation	-3.942026	-2.936942	-7.043156	-2.938987	-3.827547	-3.526609	-7.054811	-3.529758
Oil income	-0.659969	-2.935001	-5.829476	-2.936942	-1.941486	-3.523623	-5.734318	-3.526609

- The Schwarz Bayesian Criterion is used to determine the optimal lag.

The results in the table 4-2 indicate that all of the variables are non-stationary in the 5% level, and all of them become stationary at their 1st difference, except for inflation which is stationary at this level.

3.4 Cointegration Test

Considering that all the variables are best characterized as order one integrated, we evaluate the long-run relationship between components of insurance premiums and GDP. We used Johansen's (1992) test to find whether there exists a cointegration vector. Although Johansen and Juselius (1990) argued that the maximum Eigen-value test may be better than a trace test, we used both of them. The following tables report the cointegration test results.

Cointegration refers to a linear combination of non-stationary variables. When there is a long-run relationship among a set of integrated variables, the linear combination of integrated variables must also be stationary.

Table 3: Cointegration test with trend assumption of Linear deterministic trend Unrestricted cointegration rank test (Trace)

Hypothesized No of CE(s)	Eigen value	Trace Statistic	Critical Value	Prob *
No long-run relationship	0.776762	129.6223	88.80380	0.0000
At most 1 long-run relationship	0.557221	69.64168	63.87610	0.0151
At most 2 long-run relationship	0.407915	37.05432	42.91525	0.1704
At most 3 long-run relationship	0.246406	16.09014	25.87211	0.4854
At most 4 long-run relationship	0.112504	4.774058	12.51798	0.6291

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level. As the amount of trace statistic 37.05432 is less than the amount of critical value 42.91525. Also the probability i.e. 0.1704 is more than 0.05. So the null hypothesis stating that there are at most 2 long-run relationships is accepted.

Table 4: Cointegration test with trend assumption of Linear deterministic trend Unrestricted Cointegration Rank Test (Maximum Eigen value)

Hypothesized No of CE(s)	Eigen Value	Maximum Eigen value Statistic	Critical Value	Prob *
No long-run relationship	0.776762	59.98060	38.33101	0.0001
At most 1 long-run relationship	0.557221	32.58736	32.11832	0.0438
At most 2 long-run relationship	0.407915	20.96418	25.82321	0.1925
At most 3 long-run relationship	0.246406	11.31609	19.38704	0.4813
At most 4 long-run relationship	0.112504	4.774058	12.51798	0.6291

Maximum Eigen value test indicates 2 cointegrating eqn(s) at the 0.05 level. As the amount of Maximum Eigen value statistic 20.96418 is less than the amount of critical value 25.82321, and the probability i.e. 00.1925 is more than o.o5, the null hypothesis stating that there are at most 2 long-run relationships, is accepted.

3.5 Estimating the vector autoregressive model (VAR)

When using a VAR model which consists of all of the variable's lags, it is first necessary to make sure about the determined model's goodness of fit according to the number of selected lags. This issue is so important that if the selected lag length were not determined accurately, the achieved result won't be valid. So, at first the significance of the VAR model will be tested.

In the VAR model which is used the lag length is considered 1 by applying Schwarz Bayesian criterion.

As mentioned above, one should make sure that the selected lag lengths are significant. The criterion to test is that all the estimated characteristic roots should be less than unit or lies inside the unit circle.

Table 5: Roots of Characteristic Polynomial for the VAR Model

Root	Modulus
0.935951	0.935951
0.685558	0.685558
0.374048	0.374048
0.260154	0.260154

No root lies outside the unit circle. So the VAR satisfies the stability condition.

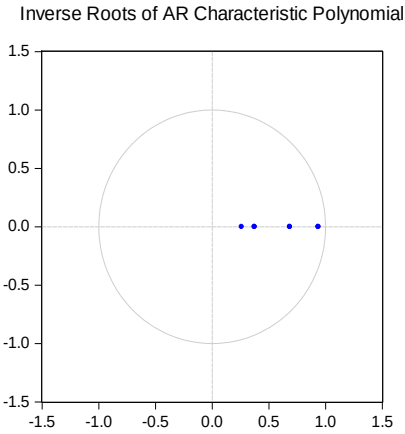

Figure 1: Inverse Roots of AR Characteristic Polynomial of the VAR Model

According to the above AR roots table and the corresponding graph, no root lies outside the unit circle. So VAR Models satisfy the stability condition.

The VAR model equation for life insurance estimates is as follows:

$EG_{t} = 0.636\ EG_{t-1} + 0.146\ M_{t-1} + 0.068\ GLI_{t-1} - 0.001\ \prod_{t-1} + 1.098 + 0.154\ \alpha_{t-1}$

Where,

EG_t = Growth of log (GDP)

GLIt = Growth of log (life insurance premium in *t* year)

M_t= log (Money supply)

$\prod_t$=Inflation

α_t=log (Oil Income)

After Vector Autoregression Estimates, the estimated coefficients will be obtained. Here, the significance of coefficients for GDP and life insurance is investigated according to the t-statistic.

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Table 6: t-statistic test result

Variables		GDP
Life insurance(-1)	Coefficient	0.067987
	Standard error	(0.03302)
	t-statistic	[2.05873]

It is concluded that the relationship between the growth of life insurance and growth of GDP is statistically significant, as the t-statistic is more than 2. It indicates a positive relationship between them.

Table 7: Granger causality test for life insurance & GDP

Null Hypothesis	F-Statistic	Prob.
growth of Life does not granger cause growth of GDP	11.2646	0.0018
growth of GDP does not granger cause growth of Life	13.8043	0.0007

As in both of null hypotheses the probabilities are less than 0.05, they are both rejected. Furthermore, there is a two-side causal relationship between growth of life insurance and the growth of GDP i.e. they affect each other. But because the coefficients obtained in the estimation of VAR model showed that GDP doesn't have a statistically significant coefficient in relation to life insurance, the causal relation from growth of GDP to growth of life insurance is not meaningful. Therefore, we just concluded one direction causal relation from the growth of life insurance to the growth of GDP, as its corresponding coefficient is statistically significant.

3.6 Impulse Response Functions

By means of these functions we want to test the effect of creating a standard deviation of a shock in each of the selected variables in the system, and scan the reaction and response of the other variables in the entire system. The results are shown in the following tables and graphs.

Table 8: Generalized Impulse Responses to one SE shock in the equation for Life insurance

Horizon	GDP	Money Supply	Life insurance	Inflation
1	0.000000	0.000000	0.10883	-0.62854
2	0.036808	0.005603	0.083660	-0.60914
3	0.038387	0.012821	0.066639	-0.49407
4	0.033319	0.017295	0.054792	-0.38181
5	0.028101	0.019517	0.046409	-0.29361
6	0.023883	0.020349	0.040406	-0.22926
7	0.020629	0.020376	0.036058	-0.18380
8	0.018112	0.019940	0.032870	-0.15228
9	0.016131	0.019241	0.030494	-0.13071
10	0.014535	0.018399	0.028690	-0.11615

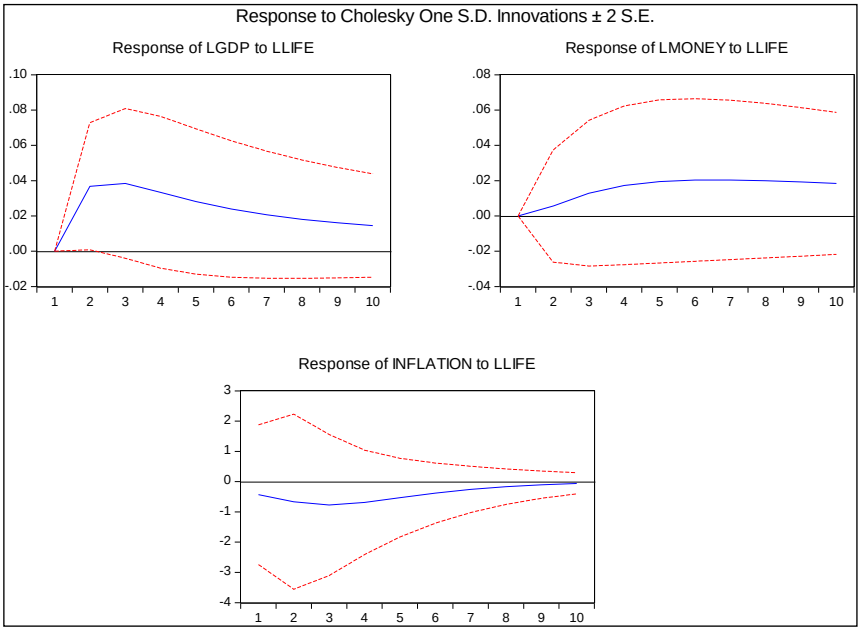

Figure 2: Impulse Response for Life insurance (Responses of the variables to one SE shock in the equation for life insurance)

In response to one SE shock in the equation for life insurance premium logarithm, when the life insurance premium increases in the long-run (10-years), GDP increases also for about three periods. Then the effect of the shock will be dampened in the long-run (10-years) and the system will go toward equilibrium. So their trends have the same direction. This means that the relationship between changes of

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the life insurance premium and GDP is positive. The GDP graph in the positive area (above the horizontal axis) indicates a positive relationship between life insurance and GDP. Also in response of money supply to life insurance, money supply increases till seven periods and after that the effects of changes has been dampened in the long run, in addition the line is in the positive area indicating positive relationship between them, as money supply provide liquidity for the financial markets like insurance market. In addition, it is seen that inflation, which is in the negative area has a negative relationship with life insurance, since it acts as an obstacle against financial markets.

3.7 Forecast Error Variance Decomposition Function

This function is also calculated as Impulse Response Functions by using the VAR model and used for the inference of short-run dynamism. In this function the error of forecasting that is created in relation with each of the selected variables, is considered. Then the proportion of the system variables in justifying it, is calculated and determined. The results of FEVD are shown in the following table and graphs.

Table 9: Variance Decomposition of Forecast Error for variable Life insurance

Horizon	Standard Error	GDP	Money Supply	Life insurance	Inflation
1	0.099130	5.231235	0.015143	94.75362	0.000000
2	0.129849	7.202377	0.106030	92.68640	0.005195
3	0.149574	8.567006	0.270498	91.15622	0.006280
4	0.163181	9.536618	0.474103	89.98251	0.006774
5	0.173183	10.26571	0.688199	89.03835	0.007744
6	0.180916	10.83931	0.896311	88.2548	0.009703
7	0.187112	11.30454	1.090386	87.59231	0.012758
8	0.192200	11.68959	1.267132	87.02659	0.016679
9	0.196448	12.01272	1.425792	86.54038	0.021112
10	0.200036	12.28655	1.566909	86.12081	0.025724

According to the results gotten from the table 3-15, during the periods, the proportion of life insurance premium in explaining its forecast error variance decomposition decreases, and the proportion of other variables increases as the percentage of life insurance premium in two periods gets 91%, and 88% after 5 periods. Then it decreases in a low pace to 86% after 10 periods. While the proportion

of life insurance premium is decreasing, the proportion of money supply is increasing from about 0.01% to 1.5% in these 10-years. The proportion of GDP also increases in a low pace during these 10-years from 5% to 12%. Finally, the inflation's proportion increases from 0% to 0.02% which is the least proportion among the other variables. As it can be seen in the previous table, life insurance premium has the most proportion in the error of variance, although this effect is going to decline in the long-run. Money supply has an increasing effect during these 10-years despite of its small proportion. The inflation has some small increasing effect in these years that is negligible.

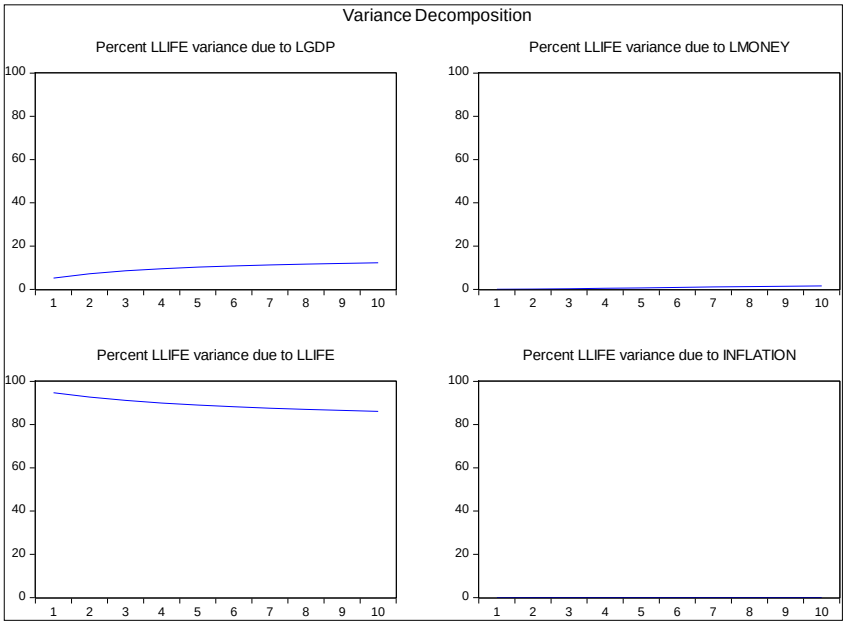

Figure 3: Generalized Forecast Error Variance Decomposition

In the 1st graph from the left, by a shock to life insurance premium, GDP proportion is going to increase while at the same time, in the graph under it, the proportion of life insurance is going to decrease; but in the graphs that are related to money supply and inflation, it can be seen that their proportions are so small, near zero, that are negligible and not visible clearly in the graphs.

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4. Conclusion

Using VAR econometrics model for time series data from Iran insurance market for life insurance premiums as the independent variable and GDP as the dependent variable along with some macroeconomic variables which have an effect on both insurance industry and economic growth such as money supply and inflation that are considered as endogenous variables of the model and oil income as the exogenous variable, in the period of 1348-1389, this study empirically examines whether the growth of life insurance sector contributes to economic growth in Iran.

The econometric results indicate that life insurance sector growth contribute positively to economic growth, which is consistent with most of the previous researches.

In the time series analysis, it is found that no series are stationary in their original forms except for the inflation, and they need to be transformed. The series became stationary after the first difference transformation. Johansen's cointegration test was used to investigate the possibility of cointegration among the series. The results of Trace and Maximum Eigen-value tests show that there are at most 2 long-run relationships between the variables. The Granger causality test was used for life insurance and GDP. The results show that life insurance Granger-causes GDP. This means that there is a causal relation between them.

Further, we interpret the result of VAR model using the impulse response function and variance decomposition. The impulse response function shows that there is a one-period lagged response of GDP, money supply and inflation to changes in life insurance premiums. The impulse response function also suggests that the responses of variables to the changes of insurance premiums after two or three periods, are dampened in the long-run and the system goes toward equilibrium.

Variance decomposition suggests that in average more than 89% of the variation in the forecast error of life insurance premiums is explained by its own shock, while 9.89%, 0.78% and 0.01% of the variations are explained by GDP, money supply and inflation respectively. This means that the effects of other variables are

relatively small in explaining the behavior of life insurance premiums as compared to their own effect.

The variance decomposition results show that current performance of insurance premiums depends largely on its past performance. This is rather typical in time series analysis when the variation of the forecast error of a series is explained by its own innovation rather than by innovation of other variables.

The econometric results show that life insurance contributes positively to economic growth in Iran. The causal relation between life insurance and GDP indicates that life insurance stimulates accumulation of savings by collecting insurance premiums from policy holders, and efficiently allocating the capital in financial markets by using life insurance actuarial reserves, because according to law insurers have to invest a determined percentage of their received life insurance premiums, called mathematical reserves, in capital market. So life insurance has supported the economic growth from two main channels of accumulation of capitals and technical innovations. Also, life insurance can maintain the financial stability of families by paying suitable compensations. In addition, life insurance is used for precautionary needs and as a means of financial investment. People perceive life policies as an alternative long-term saving which could reward them with returns in the form of annual dividends given out by the life insurance institutions. Therefore, apart from being insured, people could also participate in the diversified portfolio investments indirectly through the intermediation of life insurance institutions. This study provides also a long-run relationship between the Iranian life insurance sector and the real GDP of Iran. The insurance institutions could transform the pooled funds from premiums into financial investment and real property investment. It would widen the country's savings-investments nexus which in turn would increase the country's output and strengthen the country's economy.

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