DEVELOPMENT AND ECONOMIC EFFECTS OF THE **INSURANCE SECTOR IN TURKEY**

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Abstract

In developing economies, a proportion of the insurance sector is increasing for development of financing investment and financial services day by day. Insurance company contributes to economic development by transferring premiums collected to capital market. In this study, the effect of insurance sector in the process of Turkey's economic development is analyzed. In the study, relationship between economic development and insurance sector is analyzed by Granger Causality Test and VAR Model. The analysis is done by using trimester data between 2006-2014 years. Economic development; insurance sector with gross domestic product; is represented by parameters of Life Premium Product; Non-life Premium Product and Total Premium Product. A positive relationship is determined between economic development and insurance sector.

Keywords: Insurance, Turkish Insurance, Economic Development, Economic Effect, Granger Causality Test, VAR

INTRODUCTION

One of the major issues of Turk economy is the savings gap. Due to saving gap financial markets cannot afford funding needs. Proper economic condition and recovery of middle class's level of income boost the insurance sector in Turkey. Insurance sector builds trust in economic and social life. This contributes to capital market in the country's capacity of funding. The insurance sector is a demonstration for the level of development.

Unfortunately, in Turkey the insurance sector is unsatisfactory. Especially, per capita insurance premiums and share of insurance sector in domestic income are less than expected. Insurance sector should be supported by both government and finance market so as to increase



contribution on economy in Turkey. On the purpose of boosting insurance sector and an increased level of savings, state subsidy is provided to Individual Retirement System. By year of 2014 in Turkey 5 million participants were included in Individual Retirement System and a \$13 billion fund has been accumulated.

The aim of this part is finding out if there is a relation between the Turkish insurance sector and economic development. This section is composed of two parts. General information related to the insurance sector is given in first part of the study including the progress of the insurance sector in Turkey examination by graphical analysis. In second part, the relation between insurance sector and economic development is analyzed with econometric method then results are presented.

Insurance Concept and Economic Functions

According to the American Risk and Insurance Association, insurance is "Paying identified loss, transferring to contract insurance corporation possibilities of appearance about loss on the subject of other material damage recovery" (Rejda 2008). According to Dorfman the definition of insurance is "is a financial arrangement which rebuild distribution of unexpected loss' cost" (Dorfman, 2002).

The task of the insurance sector, by providing to carry on daily life and activities of individuals and companies is protecting against economic, climatic, technologic, political and demographic risks(Insurance Europe, 2012). In this respect, insurance nowadays constitutes confidence factor in economic and social life. Development of financial market is contributed with creating funding in the country (Baltensperger and Bodmer, 2011).

At the same time, by means undertaken by the function of the insurance sector, it contributes to the national economy. Nowadays insurance sector is added to economical development models and for much research conducted it is proved that insurance sector contributes to economic development (Karaman, 2013).

Insurance business is not only means that guaranteeing risks and recouping them when damaged, but also it is a system which completes several economical functions. These functions (Sarioğlu and Taşpınar, 2011):

- a) Contributing to development of finance market ,
- b) Providing risk transfer,
- c) Taking on financial intermediation
- d) Contributing to employment
- e) Expanding effect on international economic relations



Globalization of commercial activities in industrial and service area increases the importance of global insurance activities. Owing to the fact that this development is further developing economies, this increases appeal of insurance sector (Thornburn, 2008; Poposki, 2001). If the thought that progression of markets influences positively to economic development, it is true, it is obvious, the importance of factors of contributing to constituting a strong insurance market (Chetty and Looney, 2006).

Insurance Sector and Development in Turkey

Case in point of Turkish finance sector's activity, the size of banking is the biggest financial corporation. Predominantly composed of banking sector, the Turkish finance sector carries on development. Finance sector's activity by size in Turkey is given in Table 1.

Financial Corporation	Balance Sheet Size (%)
Banks	87,4
Insurance Companies	3,2
Mutual Funds	2,0
Real Estates Investment Trusts	1,5
Retirements Funds	1,3
Financial Leasing Companies	1,3
Factoring Companies	1,2
Consumer Financing Company	0,7
Instrument Intermediary	0,7
Financial Holding Company	0,4
Other	0,3

Table1:Distribution of Financial Sector's Balance Sheet Size in Turkey (2013)

Source: TCMB, 2013, 35

At 87.4% of finance sector, banking sector is by and large the largest sector. In the point of balance sheet size in finance sector insurance companies has 3.2% of the market. The insurance sector in Turkey is unsatisfactory in comparison with the other her countries' insurance sector's market share. Mostly a great majority of domestic insurance companies in Turkey operate within the structure of banks. There is almost no insurance company which operates independent and self established. Hereby the major benefitting factor is from the wide branch network of banks.

In developed countries the insurance sector is essential, and gains importance also in developing countries recently. It is observed that in western countries, insurance companies whose growth is underrepresented are highly invested in especially high potential growth including developing countries which includes Turkey.



Activity-Area	2008	2009	2010	2011	2012	2013
Insurance and Retirement Companies	59	58	62	64	64	60
Life	11	9	11	9	8	6
Retirement	12	13	13	16	17	18
Non-life	36	36	38	39	39	36
Reassurance Companies	2	2	2	2	2	1
Total	61	60	64	66	66	61

Table 2: Number of Insurance, Reassurance & Retirement Companies in Turkey

Source: Turkey Association of Insurances, 2013

As it seen in Table 2, in 2013, 61 operating companies whose 36 are in non-life insurance, 6 are in life insurance, 18 are in life and retirement and one in reassurance are license holders.

Insurance Sectors in Turk Economy and Capacity of Funding

By creating fund from premiums and with transferring these funds to investment instruments such as bonds, shares and land estates; insurance companies contributes to national economy. In addition, regularity of trade strengthens economy by building up social structure (Çekici and İnel, 2013).

In economic analysis financial development for economical growth takes a leading role. A well operated financial corporation increases funding distribution activities and savings and improve capital formation. In conclusion, they lead to more efficient and growing economy (Hussels, Ward and Zurbruegg, 2005).

(Million / %)	2009	2010	2011	2012	2013
Premium Income	12.436	14.130	17.164	19.829	24.227
Ins.Coverage	24.937.878	30.661.735	39.163.051	49.713.953	62.820.060
Accum.Funds in Life Ins.	3.309	3.159	3.087	2.880	2.565
Accum. Funds in	9.125	11.999	14.315	20.272	26.270
PensionSystem					
GDP (*)	952.559	1.098.799	1.297.713	1.416.817	1.561.510
Premium/GDP	1,28	1,26	1,29	1,37	1,52
Coverage/GDP	2.617,99	2.790,48	3.017,85	3.508,85	4.023,03
Accum.Funds in Life Ins./GDP	0,52	0,48	0,44	0,20	0,16
Accum. Funds in	0,96	1,09	1,10	1,43	1,68
PensionSys./GDP					

Table 3: Gross Premium Volume, Coverage, Accumulated Funds and GDP in Turkey

(*)With current prices and production method





In Turkish insurance sector the ratio of Premium production to GDP was 1, 28 in 2009, whereas the ratio rose to 1, 52 in 2013.Life Premium production decreased by years. In 2009 the ratio of life Premium production to GDP was 0, 52, whereas in 2013 it decreased to 1, 16. The major rise was in individual pension funds. The ratio of Individual Pension Funds to GDP was 0, 96 in 2009, it increased to 1, 68 in 2013

Empirically testing of Relation between Turk Insurance Sector & Economic Development

The first study started about the relation between economic development and insurance sector in second half of 1980 year (Sarıoğlu and Taşpunar, 2011). When the literature studies were done determining this relation between economic development and insurance sector were researched, generally existing positive relation was detected. Table 4 demonstrates summaries of studies for effect of insurance sector on economic development.

Researcher	Term	Countries	Method	Result
Ward and Zurbruegg (2000)	1961-1996	9 OECD Country	Panel Data, Granger Causality	Positive
Webband et al. (2002)	1980-1996	55 Country	Panel Data	Positive
Zuo (2004)	1986-1995	China	Time Series	Positive
Kugler and Ofoghi (2005)	1966-2003	England	Granger Causality	Positive
Hızlı (2007)	1980-2004	Turkey	Granger Causality	Negative
Köse et al. (2008)	1981-2008	Turkey	Granger Causality	Positive
Arena (2008)	1976-2004	55 Countries	Dynamic Panel Data	Positive
Haiss and Sümegi (2008)	1992-2005	29 EU Countries	Cross Section Analysis	Positive
Han and others (2010)	1994-2005	77 Countries	Dynamic Panel Data	Positive
Njegomir and Stojic	2002-2008	Bosnia Herzegovina,	Panel Data	Positive
(2010)		Croatia, Macedonia,		
		Serbia, Slovenia		
Ege and Saraç (2011)	1999-2008	29 Countries	Panel Data	Positive
Kjosevski (2011)	1955-2010	Macedonia	Time Series	Positive
Omoke (2012)	1970-2008	Nigeria	Time Series	Negative

Table4: Summaries of Studies for Effect of Insurance Sector on Economic Development



METHODOLOGY

In the study relations between economic development and insurance sector are analyzed with Granger Causality Test and VAR Model. The analysis is made by using data of trimester between 2006:03-2014:03. Economical development, GDP with insurance sector, is represented with parameters L-PREMIUM, NL-PREMIUM and T-PREMIUM.GDP variables used in analysis are inquired from T.C. Central Bank EVEDS, L-PREMIUM, NL-PREMIUM and T-PREMIUM variables are inquired from Insurance Association of Turkey

Table5: Codes of Variables Used in Studies				
GDP	Gross Domestic Product			
L-PREMIUM	Life Premium Production			
NL-PREMIUM	Non-lifePremium Production			
T-PREMIUM	Total Premium Production			

Relation between economic development and insurance sector is presumed by using Granger Causality Test and VAR Model. VAR Model is accommodated by Sim (1980) in an attempt to presume relations between endogenous variables without limitation.VAR analysis generally is used in an attempt to presume systems consisting of interrelated series and to analyze dynamic interactions between variables (Gujarati, 2010).

In this study, VAR method whose delay is increased developed by Toda and Yamamoto (1995), is utilized with the aim of determining casual relations between series.

Stationary Analysis (Unit Root Test)

If variance and average of serial do not change in time and if common variance between terms do not depend on calculated term, but it depends on distance between terms; This time series is steady state (Gujarati,2009:). One of widely accepted tests which are used for determining if the series is steady state is Augmented Dickey Fuller (ADF) Test (Davidson and MacKinnon, 1999). For ADF Test the regression equation written below is presumed (Lee, 1997:277):

$$\Delta Y_t = \alpha + \gamma t + \rho Y_{t-1} + \sum_{i=1}^k \beta_i \ \Delta Y_{t-i} + \xi_t$$

In equation:

- Δ :First differences operators,
- Y_t : Related variables,
- K :Delay length,
- ξ_t :Error Term.



Null hypothesis, it is stated that Y_thas got unit root. In case presumed coefficient of delayed variable in other words p is statically different from zero, null hypothesis is rejected. If p is equal zero, null hypothesis is accepted and it is remarked that the serial is not steady state. Nonstationary time serial at original level should be taken with differences until it will be steady state $(\Delta = \mathbf{Y}_t - \mathbf{Y}_{t-1}).$

To be steady state variable taken differences d times, is named as I(d) or dth degree integrated period. It is stated that I(d) variable has got d number of roots (Lee, 1997:277). Phillips and Perron (1998) developed nonparametric unit root test. Unit root tests of ADF and PP' common point is testing that time series has unit root. Besides stationary of related series are examined with KPSS (Kwiatkowski-Phillips-Schmidt-Shin) unit root test which is put forward by Kwiatkowski, Phillips, Schmidt and Shin (1992) In this study ADF method is used with the aim of testing stationary of series .

Vector Autoregressive Model

Each variables studied in VAR Model are composed of regression on all variables in Model and previous values. For a system with p variable, a VAR Model had k delayed coefficient could be written such as below one (Alper, 2005):

 $Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + \dots + A_k Y_{t-k} + B X_t + \varepsilon_t$

In this system which has got ρ number of equation, Y_t symbolizes ρ dimensional endogenous variable vectors; A_1, A_2, \dots, A_k and B, symbolizes $\rho \times \rho$ dimensional matrix of coefficient; Xt symbolizes p dimensional deterministic variable vector composed of constant term, linear trend and dummy variables and also ε_t symbolizes ρ dimensional error terms vector proved all assumptions.

Co-integration Analysis and Granger Causality Test

The aim of using Granger Causality Test is both existing casual connection between two variables and at the same time testing its direction. Granger Causality is defined this way.

Forecast of Y, when back values are used, If X is more successful than the situation at which back values of X is not used, is Granger cause of Y. Provided that defining is true, casual connection is showed like this $X \rightarrow Y$ (Gujarati, 2009). The Standard Causality Granger Test depends on VAR model. On the condition that co integration occurs between series, Causality Granger Test depended on VAR model can cause incorrect results. To eliminate this issue, VECM is needed to estimate (Engle and Granger, 1987). Causality Granger Test depended on VECM which tests that under condition of null hypothesis there is no existing casual relationship, can be written as:



$$\begin{split} \Delta Y_{t} &= \alpha_{0} + \sum_{i=1}^{p-1} \alpha_{1i} \Delta Y_{t-i} + \sum_{i=1}^{p-1} \alpha_{2i} \Delta X_{t-i} + \varphi_{1} ECT_{t-1} + \varepsilon_{1i} \\ \Delta X_{t} &= \beta_{0} + \sum_{i=1}^{p-1} \beta_{1i} \Delta Y_{t-i} + \sum_{i=1}^{p-1} \beta_{2k} \Delta X_{t-i} + \varphi_{2} ECT_{t-1} + \varepsilon_{2i} \end{split}$$

While ECT expresses long term co-integration relationship, *expresses* error term. Causality Granger Test depended on VECM can test casual relation in both short term and long term. In Causality Granger Test depended on ECT_{t-1} VECM, Wald (f-test) is carried out for testing casual relation from X to Y. It is used with t-statistic with the purpose of determining long term casual relation (Yoo, 2009).

EMPIRICAL FINDINGS

Table 6: Determining Statistics

Variables	Minimum	Maximum	Average	Stand. Dev.	Period
GDP	20.842.792.000	33.529.893.000	27.482.821.970	3.004.468.470	33
L-PREMIUM	226.557.434	3.395.327.657	1.423.630.502	767.992.149	33
NL-PREMIUM	3.245.125	20.834.288.077	8.161.948.737	4.778.365.862	33
T-PREMIUM	524.607.376	24.229.615.734	9.585.579.239	5.523.927.329	33

Between 2006:03-2014:03 years in Turkey GNP is average 27.487 million TL, L-PREMIUM is average 1.423 million TL, NL-PREMIUM is average 8.161 million TL, T-PREMIUM average is 9.585 TL.

With the purpose of detecting if independent variables normally distribute, multi linear regression analysis is done. Firstly, logarithmic conversion of our data is should be calculated. Results of multi linear regression analysis are given in Table 7.

Variable	Coefficient	Std. Error	t-Statistic	Prob.	
LOGH_PRIM LOGHD_PRIM LOGT_PRIM C	0.008915 -0.053838 0.176754 21.03089	0.139131 0.053312 0.184281 0.498045	0.064076 -1.009865 0.959153 42.22688	0.9493 0.3209 0.3454 0.0000	
R-squared Adjusted R-squared S.E. of regression Sumsquaredresid Loglikelihood F-statistic Prob(F-statistic)	0.573497 0.529376 0.077123 0.172492 39.86460 12.99826 0.000015	Meandepe S.D. depe Akaikeinfo Schwarzc Hannan-G Durbin-Wa	endent var indent var poriterion riterion Quinncriter. atson stat	24.03076 0.112421 -2.173612 -1.992217 -2.112578 1.795692	

Table 7. Least Squares Results



Seeing that probability values H-Prim, HD-Prim and T-Prim which are independent variables are less than 0,05, it is insignificant. In our Model there is a connection problem. Consequently turnover is applied to the model.

To research if structural breaking occurs concerning variables, CSUM and CUSUM Test which uses squares of recovery waste and with this way researching breaking related with variables in the system is done. In structural breaking tests CUSUM of Squares test is more sensitive than CUSUM test. In this study, results of both two tests are examined for determining structural breaking.



When results of CSUM test is viewed (Fig 1), there is no structural breaking for being in graphic limits. When results of CUSUM of Squares test is viewed (Fig 2) between 2008 and 2011. To adjust structural breaking "dummy" valuable is formed and result of CUSUM of Squares Test is viewed one more time.





After adjusting, when results of CUSUM of Squares Test are viewed, there is no structural breaking in the model. ADF tests are used to examine stability in series. We draw graphic to understand if our series is steady state.





In first graphics normal distribution of variables takes place. In second graphics logarithmic distribution of variables takes place. In third graphics is drawn by taking differences on first degree of variables. As we look at all graphics, it is seen that variables in this study are continuously increasing and decreasing en route. To determine if our series is steady state Augmented Dickey Fuller (ADF) test is done. Test results are given in Table 8.

Variables			Augment	ed Dickey Ful	ler (ADF)	
		t-Statistic	Prob.	1% level	5% level	10% level
	Intercept+Level	-3.833362(2)	0.0069	-3.679322	-2.967767	-2.622989
	Intercept+1st Difference	-19.84974(1)	0.0001	-3.679322	-2.967767	-2.622989
	Trend andIntercept+Level	-17.49282(1)	0.0000	-4.296729	-3.568379	-3.218382
GDP	Trend and Intercept+1st Difference	-9.106833(2)	0.0000	-4.323979	-3.580623	-3.225334
	None+Level	-3.378131(2)	0.0015	-2.647120	-1.952910	-1.610011
	None+1st Difference	-20.22967(1)	0.0000	-2.647120	-1.952910	-1.610011
	Intercept+Level	-14.81636(2)	0.0000	-3.679322	-2.967767	-2.622989
	Intercept+1st Difference	-7.471663(4)	0.0000	-3.711457	-2.981038	-2.629906
	Trend andIntercept+Level	-14.52698(2)	0.0000	-4.309824	-3.574244	-3.221728
L-PREMIUM	Trend and Intercept+1st Difference	-3.795971(7)	0.0356	-4.416345	-3.622033	-3.248592
	None+Level	-14.47991(2)	0.0000	-2.647120	-1.952910	-1.610011
	None+1st Difference	-3.679064(6)	0.0008	-2.664853	-1.955681	-1.608793
	Intercept+Level	-8.151231(1)	0.0000	-3.670170	-2.963972	-2.621007
	Intercept+1st Difference	-6.346691(7)	0.0000	-3.752946	-2.998064	-2.638752
	Trend andIntercept+Level	-5.344968(7)	0.0013	-4.394309	-3.612199	-3.243079
NL- PREMIUM	Trend and Intercept+1st Difference	-5.599275(7)	0.0008	-4.416345	-3.622033	-3.248592
	None+Level	-8.289855(1)	0.0000	-2.644302	-1.952473	-1.610211
	None+1st Difference	-6.639076(7)	0.0000	-2.669359	-1.956406	-1.608495
	Intercept+Level	-5.948579(6)	0.0000	-3.724070	-2.986225	-2.632604
	Intercept+1st Difference	-3.586189(5)	0.0137	-3.724070	-2.986225	-2.632604
	Trend andIntercept+Level	-5.368921(7)	0.0012	-4.394309	-3.612199	-3.243079
T-PREMIUM	Trend and Intercept+1st	-4.072481(5)	0.0191	-4.374307	-3.603202	-3.238054
	Difference					
	None+Level	-3.355282(6)	0.0017	-2.660720	-1.955020	-1.609070
	None+1st Difference	-3.570078(5)	0.0010	-2.660720	-1.955020	-1.609070

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When ADF test results are examined, providing the result of t-Statistic is higher than significance levels as absolute value is 1%,5%, 10%, our series is steady state. Similarly, providing probability values are lower than 0, 05, our series is steady state.

While ADF test is done, delay length of series is set free. Results in table are caught at which delay length, is determined in parenthesis, as results of t-Statistic are given. T-Statistic results of GDP series are higher than significance levels as absolute value is 1%,5%,10%. Similarly, whole probability values are lower than 0, 05 GDP series are steady state.



L-PREMIUM series' whole probability values are lower than 0, 05.T-statistic values are higher than significance levels as absolute value is 1%,5%,10%.L-PREMIUM is steady state. NL-PREMIUM series' probability values are lower than 0, 05. T-statistic values of our series are higher than significant levels as absolute value is 1%,5%,10%.NL-PREMIUM is steady state. NL-PREMIUM series' whole probability values are lower than 0, 05.T-statistic values of our series are series are higher than significance levels as absolute value is 1%,5%,10%.NL-PREMIUM is steady state.

T-PREMIUM is steady state. It is possible to support existing co integration relationship with stability of error term which is taken from vector of co-integration and characteristic roots of VAR system. In this context, characteristic roots of the system are given in Graphic 6. For existing co integration relationship one of characteristic roots of system should be 1, the other's should be lower than 1 as a value.



As seen in Fig 6, taking place all characteristic roots in unit circle and having symmetric projections of roots supports co-integration relationship. In the study, because of using quarter data the highest delay length is chosen as 4 and delay length which makes critical values lowest such as Akaike(AIC), Schwarz(SC) and HannanQuinn(HQ), is attempted tried to be determined.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-16.97606	NA	5.26e-05	1.498290	1.688605	1.556471
1	29.50283	76.35818	6.05e-06	-0.678774	0.272801	-0.387868
2	83.30117	73.01203	4.40e-07	-3.378655	-1.665821	-2.855024
3	125.3830	45.08771*	8.46e-08	-5.241645	-2.767551*	-4.485290
4	150.1129	19.43060	7.26e-08*	-5.865207*	-2.629853	-4.876127*



When Results in table 9 are seen, it is seen that AIC and HQ delay number of information criterions is given as 4. It is agreed that Delay length of model are taken as 4.

	Ũ		5				
Dependent variable	Dependent variable: LOGGSYIH						
Excluded	Chi-sq	df	Prob.				
Logh_prim Loghd_prim Logt_prim	0.802887 3.409819 1.558432	4 4 4	0.9381 0.4917 0.8162	REJECTION REJECTION REJECTION			
All	63.60015	12	0.0000				
Dependent variable: LOGH_PRIM							
Excluded	Chi-sq	df	Prob.				
LOGGSYIH LOGHD_PRIM LOGT_PRIM	13.29040 10.05075 11.28060	4 4 4	0.0099 0.0396 0.0236	ASSENT ASSENT ASSENT			
All	90.27195	12	0.0000				
Dependent variable	e: LOGHD_PRIM						
Excluded	Chi-sq	df	Prob.				
LOGGSYIH LOGH_PRIM LOGT_PRIM	41.39442 5.485453 7.875836	4 4 4	0.0000 0.2410 0.0962	ASSENT REJECTION REJECTION			
All	95.65415	12	0.0000				
Dependent variable	e: LOGT_PRIM						
Excluded	Chi-sq	df	Prob.				
LOGGSYIH LOGH_PRIM LOGHD_PRIM	42.83565 6.234980 9.731515	4 4 4	0.0000 0.1823 0.0452	ASSENT REJECTION ASSENT			
All	130.7193	12	0.0000				

Table 10: Granger Causality Analysis Results

Delay length of Causality test is calculated as 4 in Table 10.Cause of total of L-PREMIUM is not GDP Granger. Cause of total of NL-PREMIUM is not GDP Granger. Cause of total of T-PREMIUM is not GDP Granger.GDP is Granger cause of L-PREMIUM production.GDP is Granger cause of NL-PREMIUM production.GDP is Granger cause of T-PREMIUM production.



CONCLUSION

Ability of increasing participation by insurance companies to capital market primarily depends on whether the insurance sector can create transit able funds to the market. Particularly, in developed economies the insurance sector is always a driving force of national economy in terms of created funds and investment. In these countries, funds which form in insurance company reaches high numbers which dominates the national economy. Consequently, insurance companies can finance some of highest investment in the world and also they are at a level which can give long term loans to developing country. At developed countries, the insurance sector's main duty is clarified that a trust factor is provided to the national economy and the society.

In addition to this, insurance has an increasing effect on the society level. As a result, in this study causality relationship is examined between GDP and the insurance sector. Quarter data is used between 2006Q3 and 2014Q3. Series are done at a steady state with ADF test; Then Granger Causality Test is run. In Granger Causality test delay length is chosen as 4.As a result between 2006Q3 and 2014Q3 terms in Turkey economy, causality relationship is found with GDP and the insurance sector. For this term, it is ensued that GDP supported Premium production of insurance sector.

This study is limited to the years 2006-2014 and guarterly insurance premium production. Further study may conducted with longer periods. Also, in further studies total GDP variable should be increased.

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