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ON INSURANCE, ECONOMIC GROWTH AND POPULATION: THE CASE OF TURKEY

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ABSTRACT

The insurance sector in Turkey has not developed enough. The primary reasons for this are legal issues, income distribution, and consciousness of insurance. When the literature in the field of insurance is examined, it is seen that it points to the importance of economic growth and population. The motivation of this study is to analyze the relationship of insurance with economic development and population. Due to the fact that Turkey has a young population and a growing economy; this research is important in terms of policy making and academic added value.

The methodology includes Stationarity tests, Hodrick Prescott Filter, Vector autoregression model, Impulse Response Function, Vector Error Correction Model along with many other tests. In the analysis, Turkey's gross insurance premium, gross domestic product and population data are used. The research period includes the date range 1983 - 2018. The study findings confirm the short-run and long-run relationship between insurance, economic growth and population in Turkey.

When the literature is examined; It has been determined that most of the studies conducted are about economic growth. Analyzing the effects of both economic growth and population makes the study original. Future research in this area could focus on cross-country

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analyzes and sub-segments of the insurance market. Thus, it can be stated that they will contribute to the enrichment of the literature by providing resources from different perspectives.

Keywords: Economic Growth, Insurance, Population, Vector autoregression, Vector error correction

SİGORTA, EKONOMİK BÜYÜME VE NÜFUS ÜZERİNE: TÜRKİYE ÖRNEĞİ

ÖZ

Türkiye'de sigorta sektörü yeterince gelişememiştir. Bunun başlıca nedenleri yasal sorunlar, gelir dağılımı ve sigorta bilincidir. Sigorta alanındaki literatür incelendiğinde, ekonomik büyüme ve nüfusun önemine işaret ettiği görülmektedir. Bu çalışmanın amacı, sigortanın ekonomik kalkınma ve nüfus ile ilişkisini incelemektir. Türkiye'nin genç bir nüfusa ve büyüyen bir ekonomiye sahip olması nedenleriyle; bu araştırma, politika oluşturma ve akademik katma değer açılarından önemlidir.

Metodoloji, diğer birçok testin yanı sıra Durağanlık testleri, Hodrick Prescott Filtresi, Vektör otoregresyon modeli, Dürtü Yanıt Fonksiyonu, Vektör Hata Düzeltme Modelini içermektedir. Analizde, Türkiye brüt sigorta primi, gayri safi yurtiçi hasıla ve nüfus verileri kullanılmıştır. Araştırma dönemi 1983 - 2018 tarih aralığını içermektedir. Çalışma bulguları, Türkiye'deki sigorta, ekonomik büyüme ve nüfus arasındaki kısa ve uzun vadeli ilişkiyi doğrulamaktadır.

Literatür incelendiğinde; yapılan çalışmaların çoğunun ekonomik büyüme hakkında olduğu tespit edilmiştir. Hem ekonomik büyümenin hem de nüfusun etkilerinin analiz edilmesi, çalışmayı orijinal kılmaktadır. Bu alanda gelecekte yapılacak araştırmalar, ülkeler arası analizlere ve sigorta piyasasının alt bölümlerine odaklanabilir. Böylece, farklı açılardan kaynak sağlayarak literatürün zenginleşmesine katkıda bulunacakları ifade edilebilir.

Anahtar Kelimeler: Ekonomik Büyüme, Sigorta, Nüfus, Vektör otoregresyon, Vektör hata düzeltme.

Introduction

Insurance is a system that provides assurance in return for the premium it receives against unforeseen and potentially emerging dangers. The insurance sector helps financial markets to function effectively. It is important not only for repairing damage or losses, but also as a long-term fund-raising function for financial markets. The sector, which is of great importance in the world, continues to grow in Turkey, which is a developing country. Foreign capital owners also follow the Turkish insurance market, which has not yet reached saturation. As a matter of fact, according to 2017 data, 44 of the 62 insurance companies operating in Turkey are foreign partners. In short, the capacity of the sector to create funds for financial

markets is very important. In addition, insurance natural disaster, fire, accident, etc. Due to the role it plays in compensating such damages, it is significant not only with its economic dimension but also with its social and psychological dimension.

The insurance industry in Turkey is a small market when compared to European countries. The consciousness of people on insurance is low. In addition, Turkey has an income distribution problem, which makes affordability of premiums difficult. There are also legal issues that hinder growth of insurance market in Turkey. The damages on the insurance contracts have increased in recent years. In addition, to attract the demand, there is also competiton in pricing.

Typical insurance products in Turkey are car, insurance, and health. Part of the reasons for this is that some of these products are mandatory. One example is the natural disaster insurance on real estate in Turkey. As Taskin et al. (2009) point out, in case of a natural disaster, there is potential loss of buildings and environment while the loss of value of land is limited. Because of the high cost of real estate investment, people tend to insure these products.

Despite the population decrease in recent years, Turkey has a young population. And the market has been growing. This attracted attention from foreign insurance companies.

There has been a lot of interest on Mergers and Acquisitions in Turkey. The primary reason for this is the growth potential of the market. (Kartal, 2008)

Akhisar I. (2014) points out that there is a close relationship between economic growth and insurance. When there is an increase in GDP, insurance market often has a higher increase than GDP. Similarly, when there is a decrease in GDP, insurance market also has a higher drop rate.

This study includes an empirical analysis on Turkish insurance market. The motivation of this study is to analyze the relationship between insurance, economic growth and population. The analysis has not only the short-run but the long-run aspects as well.

The rest of the paper is organized as follows. The next section reveals some significant works on insurance conducted previously. The data and methodology section includes information on how the data is obtained and analyzed. Solutions and recommendations section covers most of the results and implications and the conclusion section has the final remarks

Literature Review

Most works in insurance literature are related to economic growth. There are not many studies that analyze the relationship between insurance and population.

There have been attempts to harmonize insurance activities in Europe. These initiatives include the standardization of insurance contracts and sales of insurance policies between countries. There have been attempts to harmonize insurance activities in Europe. These attempts include in standardizing insurance contracts and cross country sales. Thus, the insurance industry will make a rich contribution to international risk management activities.

Cummins and Sommer (1996), one of the financial rating agencies, investigated the capital structure of insurance companies included in A.M.Best for the years 1979-1990.As a result of their studies, there is a difference between the leverage ratio of insurance companies and their total assets. On the other hand, there is a positive relationship between risk indicators and leverage ratio. they have argued.

Hrechaniuk, Lutz, and Talavera (2007) investigated the determinants of performance of Spanish, Lithuanian and Ukrainian insurance companies. As a result of the analysis, the loss premium rate, total assets and the profitability of the increase in the leverage ratio negatively; On the other hand, they found that the increase in investment expenditures had a positive effect on profitability. There is a difference between the profitability of insurance companies in Ukraine and their total assets, investment expenditures and leverage ratio. positive; negative and statistically significant results were obtained with the loss premium ratio.

Haiss and Sumegi (2008) did a panel data analysis on 29 European countries. The research period is from 1992 to 2005. They found that real interest rate and economic development affected by insurance industry.

The effects of insurance on developed and emerging economies are often analyzed separately. While most studies analyze the effect of insurance on economy, some others conclude that insurance also contributes to economic growth.

Akyüz, Bozdoğan and Hantekin (2011) In this study, 19 ratios were used by making use of the income statement and balance sheets of a joint stock company operating in the ceramics industry registered in the ISE between 1999-2008. The financial performance of this company was evaluated on a yearly basis by applying the TOPSIS method.

Oke (2012) investigated the short and long-run relationships between economic growth and insurance sector development in the Nigerian economy. The fixed-effect model was

adopted and relevant data within the period of 1985 and 2009 were collated and analysed with the use of co-integration analysis. The result of the econometric test also revealed that the extent of influence the insurance sector growth had on economic growth was limited and not direct because of some cultural, attitudinal traits and values in the country. It was recommended that government should create a good environment for insurance activities in Nigeria.

Hadhek (2014) examined the relationship between the insurance business and the economic growth of 23 OECD countries over the period 1990-2011, using a static panel data model. According to the obtained findings emerged from the empirical analysis show a positive impact of non-life insurance, as measured by the penetration rate on economic growth and a negative effect exerted by the total insurance and non-life insurance, as measured by the density on economic growth.

Stojakovic and Jeremic (2016) focus on transition economies. The countries analyzed include Serbia, Slovenia, Crotia, Montenegro, Macedonia and Hungary. The research period is between 2010 and 2014. They found that insurance market influences economic development.

Insurance industry is often analyzed in life and non-life categories. The industry is linked with several activities in economy such as international trade.

Mohy ul Din et al. (2017) studied the relationship between insurance in the USA, the UK, China, India, Malaysia and Pakistan and economic growth. The research period is between 1980 and 2015. According to the results of autoregressive distributed lag (ARDL) model, there is a long run relationship between life insurance, non-life insurance, trade openness, stock market development and economic growth.

In some analysis, economic growth per capita is analyzed. This kind of analysis includes two factors in one variable. The combined effect of economic growth and population is analyzed this way.

Sawadago et al. (2018) did an analysis on the relationship between life insurance development and economic growth. There are 86 developing countries in their analysis. The research period is between 1996 and 2011. They found that life insurance development has a positive impact on economic growth per capita. Population is an important factor in the development of insurance market. Average age and consciousness of insurance have impact on the market.

Mgeryan and Anikina (2018) studied insurance coverage of population. They conclude that if households obtain certain insurance products depending on their characteristics, a risk reduction could be achieved both for households and for the insurance market.

There are limited studies that analyze the relationship between economic growth and insurance industry in Turkey. Granger Causaliy detects relationship between the two variables.

Yıldırım (2008) made a study on Turkish Insurance Market. The research period is 2006-2014. According to the results of Granger Causality Model, there is a positive relationship between economic development and insurance industry.

Data and Methodology

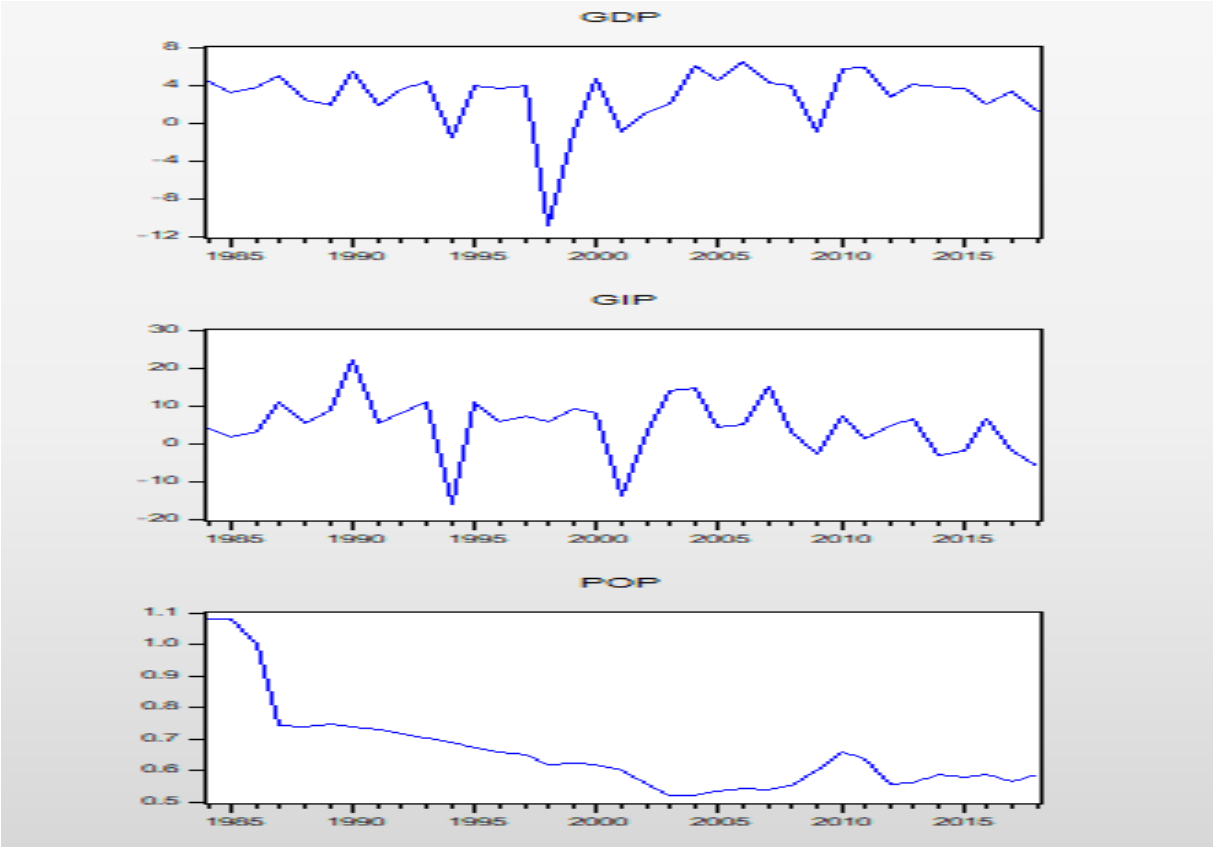
In this study, gross insurance premiums (GIP), gross domestic product(GDP), and population data for Turkey are used. Premiums are paid for holding insurance contracts. GIP is the total premiums paid in Turkey in the respective year. GDP is the total money spent on goods and services in a country. Population is the amount of people who live permanently in a country. Population and GDP data used in this study also represent values valid for Turkey only.

Annual data between 1983-2018 are used in the analysis. The data is taken from OECD database. Instead of using raw data, growth in the respective values (GIP, GDP, and Population) is used in the study. The formula below explains how the data is converted to percentage increase. R_x is the growth in terms of percentage in the period, x_t is the value of data at period t, x_{t-1} is the value of that data a period before.

$$\mathbf{R_x = \log(x_t/x_{t-1})*100}$$

After this conversion, graphs are analyzed visually for the data. The graphical representation of the data is given in Figure 1. Accordingly, there is no trend in GIP and GDP data. However, there is a trend in Population data.

Figure 1. Graphical Representation of Data



The motivation of this paper is to see the effect of GDP and Population on GIP. This way, the development of gross insurance premiums can be analyzed. Later, long run and short run effects can be analyzed in more detail.

The data is first checked for constants and trends. After that, Hodrick Prescott filter is applied to Population data. Vector autoregression, cointegration and impulse, response functions are also analyzed to see the long run relationships. Vector error correction model and granger causality are also available in this study.

Solutions and Recommendations

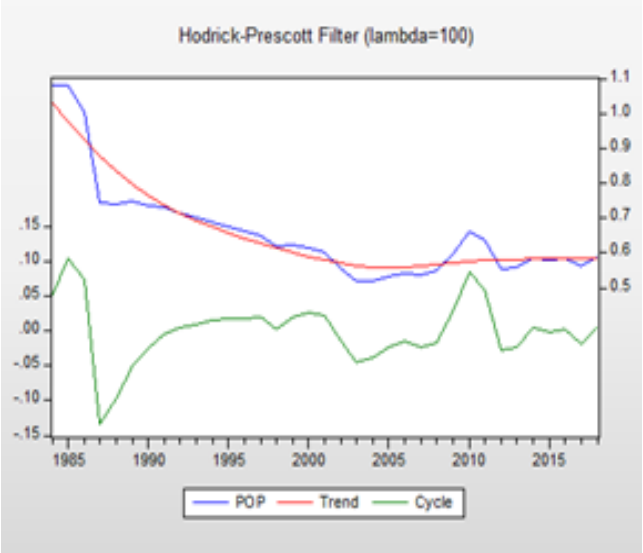
Constants and trends are analyzed for GIP, GDP, and Population data. The results for the constant and trend statistics are given in Table 1. Accordingly, a deterministic trend is available for Population. The probability values indicate that there is a constant in all regressions. No trend is detected for GIP and GDP.

Table 1. Constant and Trend Analysis

	GIP	**GDP**	**Population**
Constant	0.0027	0.02	0
Trend	0.1392	0.8275	0

To remove the trend effect from Population series (detrend), Hodrick Prescott filter has been used. The results are shown in Figure 2. Detrend population variable has no constant or trend.

Figure 2. Hodrick Prescott Filter For Population



The data is also analyzed for structural breaks. The results for the Bai-Perron analysis are given in Table 2. Accordingly there is no structural break in the data.

Table 2. Structural Break Analysis

	GIP	**GDP**
Probability	0	0.0007
Break	None	None

The series are checked for stationarity. The results are presented in Table 3. Due to the characteristics of the data, Augmented Dickey Fuller (ADF) and Philips Perron (PP) tests are used. The analysis show that the series are stationary.

Table 3. Tests for Stationarity

	Critical Value 1%	**Critical Value 5%**	**Critical Value 10%**	**ADF**	**PP**
GIP	-3.639407	-2.951125	-2.6143	-5.55467	-5.55384
GDP	-3.639407	-2.951125	-2.6143	-5.20724	-5.20911
Detrend Pop	-2.636901	-1.951332	-1.610747	-5.36995	-3.13779

A Vector Autoregression(VAR) model is also studied with these variables. Before running the model, lag order selection criterion are checked and accordingly, Schwarz criteria suggest 0 lag, the other criterion suggest 1 lag. The summary of the results is given in Table 4. As suggested by a criterion VAR(1) is modelled.

Table 4. Lag Length Criterion

Test	**Suggested Lag**
LR	1

Final Prediction Error	1
Akaike	1
Schwarz	0
Hannan-Quinn	1

The Vector autoregressive model with coefficients substituted is given below.

GIP = 0.0172623260812*GIP(-1) - 0.637372041277*GDP(-1) - 31.4423606178*DETRENDPOP(-1) + 6.47176779983

GDP = - 0.0164944679901*GIP(-1) + 0.0947907971575*GDP(-1) - 0.371438332023*DETRENDPOP(-1) + 2.5384337504

DETRENDPOP = 0.000340191832073*GIP(-1) - 0.00209032951427*GDP(-1) + 0.498783310344*DETRENDPOP(-1) + 0.00269866329613

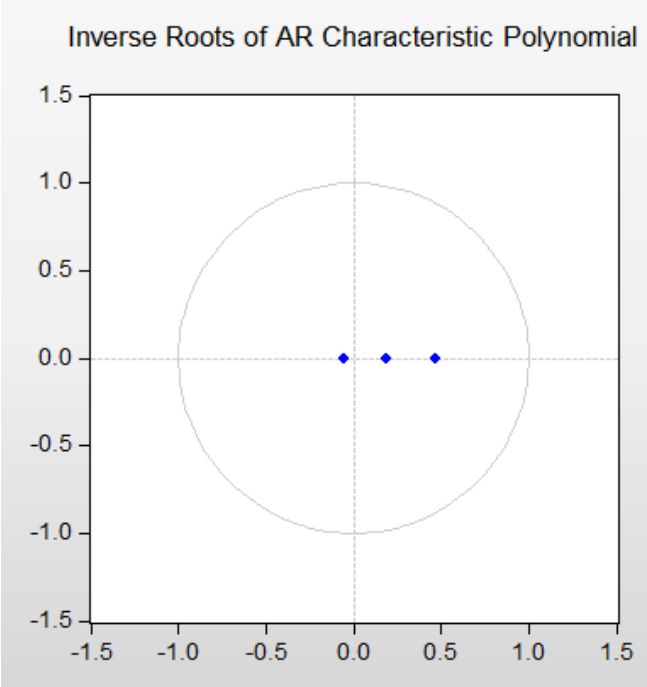
The model is checked for general least square criterion. The results are given in Table 5. Accordingly, the model does not have normality, heteroscedasticity or autocorrelation problem.

Table 5. Tests for Least Square Criterion (VAR Model)

Type of Test	**Test**	**Probability**
Normality	Cholesky	0.1769
Heteroscedasticity	White	0.9677
Autocorrelation	LM	0.132

The inverse roots of AR polynomial are also analyzed. The findings are shown in Figure 3. Accordingly, modulus of all roots is less than one. The model stability is achieved.

Figure 3. Inverse Roots of AR Polynomial



Cointegration analysis is also made for the data. Cointegration results are available in Table 6. Accordingly, both Trace test and Max-eigenvalue test indicate 3 cointegrating vectors which show long-run relationships.

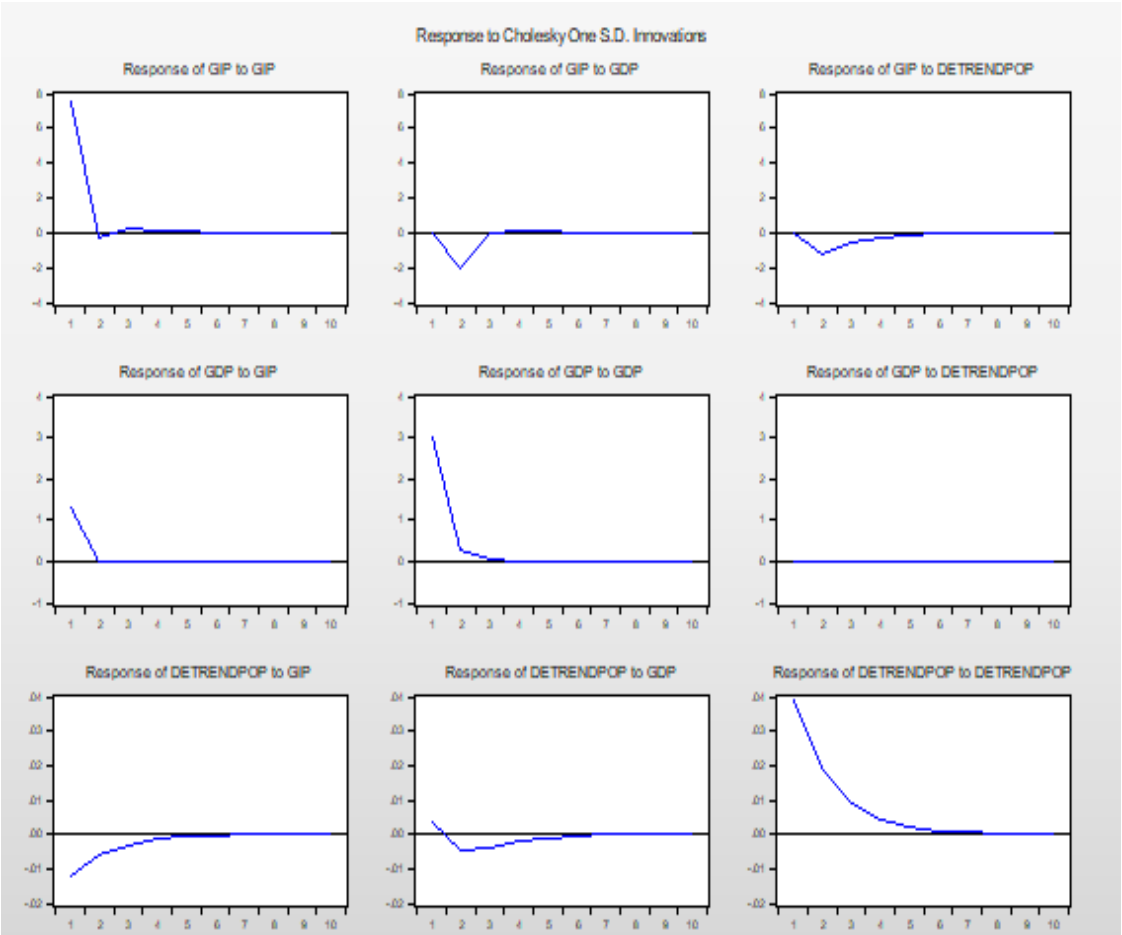
Table 6. Cointegration Results

Test	Number of Cointegrating Vectors	Probability

Trace	3	0.0006
Max-Eigenvalue	3	0.0006

Impulse response functions are also studied for the data. The results are given in Figure 4. Accordingly, when a shock in GDP or Population occurs, GIP reacts negatively for 2 lags, and after that has a positive response.

Figure 4. Impulse Response Functions



Variance decomposition analysis is also made. The results are given in Table 7. According to the results, GIP strongly influence itself in forecasting future. Other variables show their effects in the long run.

Table 7. Variance Decomposition Results

Variance Decomposition of GIP:

Period	S.E.	GIP	GDP	DETREND...
1	7.582741	100.0000	0.000000	0.000000
2	7.951587	91.10337	6.539026	2.357608
3	7.978348	90.55006	6.502548	2.947387
4	7.985340	90.40755	6.499773	3.092676
5	7.987103	90.37194	6.502205	3.125851

Variance Decomposition of GDP:

Period	S.E.	GIP	GDP	DETREND...
1	3.307828	15.92868	84.07132	0.000000
2	3.320231	15.81009	84.18802	0.001887
3	3.320848	15.80482	84.19208	0.003102
4	3.320868	15.80464	84.19170	0.003667
5	3.320871	15.80462	84.19155	0.003829

Variance Decomposition of DETRENDPOP:

Period	S.E.	GIP	GDP	DETREND...
1	0.040860	9.078106	0.608490	90.31340
2	0.045904	9.088581	1.552909	89.35851
3	0.047088	9.120101	2.079748	88.80015
4	0.047360	9.127501	2.230524	88.64198
5	0.047422	9.129190	2.267427	88.60338

Cholesky Ordering: GIP GDP DETRENDPOP

Vector error correction model (VECM) is also studied. The model with substituted coefficients is given below. It is seen that in case of an exogenous shock, GIP returns back to equilibrium fast with the rate 0.79.

D(GIP) = - 0.791056084142*(GIP(-1) + 1.37489973761*GDP(-1) + 75.1988661898*DETRENDPOP(-1) - 8.92755289772) - 0.295662251432

D(GDP) = - 0.223836095506*(GIP(-1) + 1.37489973761*GDP(-1) + 75.1988661898*DETRENDPOP(-1) - 8.92755289772) - 0.097709214742

D(DETRENDPOP) = - 0.000554919779783*(GIP(-1) + 1.37489973761*GDP(-1) + 75.1988661898*DETRENDPOP(-1) - 8.92755289772) - 0.00139248144288

VECM model is also checked for least square criterion. The results are given in Table 8. Accordingly, there is no normality, heteroscedasticity and autocorrelation problem in the regression.

Table 8. Tests for Least Square Criterion (VECM Model)

Type of Test	**Test**	**Probability**
Normality	Cholesky	0.4306
Heteroscedasticity	White	0.9767
Autocorrelation	LM	0.5714

Conclusion

The high competition for price is not a sustainable strategy for Turkish insurance companies. Companies should try to differentiate on the basis of products and services. The use of internet as a marketing channel is also a new opportunity. (Kartal, 2008)

There is a lot of improvement that can be achieved through incentives. Kisa (2001) highlights the importance of tax incentives. The incentives both on corporate and income tax could help the industry to grow. Turkey has the goal to achieve a bigger economy. For a sustainable growth, government should focus on incentives in the insurance market.

As Polat and Reva (2018) point out, another important problem of insurance industry in Turkey is insurance abuses. In Turkey, insurance fraud is common, yet it is mostly regarded as a soft abuse. More strict legal action is required on this issue. In addition, trainings would help reduce these cases.

The results of the study indicate short-run and long-run relationship between insurance, economic growth and population. The industry is sensitive to negative shocks in growth and inflation. Insurance needs two lags to start going positively after a shock. This result shows parallelism with the general results obtained in previous studies for Turkey. The tight monetary and tight fiscal policy implemented in the Transition to a Strong Economy program, which has been implemented especially in Turkey since 2001, caused the foreign currency to fluctuate.

A solution was found to the problem of overvalued Turkish lira, the public finance balance was strengthened, and a rapid regulation was made in the banking sector. While all

these are being done, institutions should have a flexible and transparent infrastructure. and as a result of the persistent and disciplined implementation of the accepted programs, inflation figures began to decline rapidly. In the same period, the Turkish economy caught a rapid growth trend and economic growth figures began to exceed expectations. Inflation and growth figures after the program of transition to a strong economy, It supports the view that there is a negative relationship between inflation and economic growth in Turkey. Moreover, the effect of economic growth and population is more visible in longer periods while forecasting future. These findings confirm the need to make structural changes such as the ones indicated in this section. Managerial strategies, tax incentives and insurance fraud should be on agenda for a stable growth in insurance market. Future studies on this field may include focus on transnational analysis and subsections of insurance.

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