THE RELATIONSHIP BETWEEN INSURANCE AND ECONOMIC GROWTH IN GERMANY, NETHERLANDS AND SPAIN

Student Bianca COSTACHE
The Bucharest University of Economics Studies
E-mail: bianca.costache95@yahoo.com

Abstract: *This study is focused on a highly relevant subject in the economic literature, more precisely how the insurance sector impacts the overall economic growth. The objective of the study is to identify, analyze and evaluate the effects of the insurance sector on economic growth for three countries: Germany, Netherlands and Spain, with data collected for the period 1984 - 2016. The results of the study proved to be important as they indicate the variation in the effects of insurance instruments due to the pecularity of each economy and the way in which each economy responds to a positive impact from the insurance sector.*
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JEL Classification: *C32, G220, O41.*

1. Introduction

Insurance field has an significant economic potential in the meaning of macroeconomic development and this requires capitalization by the regulatory authorities. In this respect, the objective of this study is to identify and assess the effects of the insurance sector on economic growth. This approach will be achieved through an econometric model, which aims to assess the intensity and direction of influence of this economic branch.

In view of this analysis, the following countries are considered: Germany, Netherlands and Spain. State selection has as a starting point an article in the form of a Note issued by EIOPA (2018), which presents the ranking of countries in terms of gross non-life-to-GDP written premiums in the European Union for the second quarter of 2017, thus providing a homogeneous study group.

In order to conduct the analysis, we used different econometric tests and methods to quantify the impact of the insurance industry on the entire economy. The results of the study are important, as they allow the formulation of proposals for guidance of insurance instruments in the direction of stimulating economic growth.

2. Literature review

This study analyzes the relationship between the activity of the insurance field and the economic growth. Given that no consensus has so far been reached on this issue, it is important to continue analyzing this correlation.

In fact, so far this relationship has been analyzed in many specialized studies in the economy, but this causal relationship is not clearly defined. On the one hand, researchers show that the development of the insurance sector is driving economic growth, and on the other hand, they indicate that the macroeconomic change of a state determines the expansion of the insurance market. So, despite the wide range of studies in the literature that tried to clarify the issues regarding the relationship between these two factors, this issue remains an opportunity that needs clarification.

The empirical study of Arena (2008) indicates the economic relationship between insurance and economic growth. The results of the study indicate a positive and significant effect of both types of insurance on the economic growth rate. The impact of life insurance on growth is only high for developed countries. For non-life insurance, the impact is

significant in both types of analyzed countries, but the effect has been shown to be higher for developed countries.

Subsequently, Han (2010) studied the connection between the insurance density as a defining factor in the development of this sector and the real GDP per capita as an indicator of economic growth. The conclusion comes to the hypotheses mentioned above, namely the strong influence between the insurance and the increase of the general economic growth. The study also indicates that non-life insurance has a strong correlation with GDP as opposed to life insurance. Both types of insurance have been shown to have a higher influence on developing countries.

İlhan Ege (2011) addressed the insurance role in the economic growth process and the results of the study indicate that the development of the insurance sector leads further to the macroeconomic progress of the countries included in the study.

Further, the demand of the insurance population is subject to analysis in several respects. Literature studies illustrating this relationship are focused on income in its various forms as the main factor influencing the consumption of insurance.

In this regard, author Campbell (1980) has shown that insurance is positively correlated with income. This influence is explained from the perspective of two components. First, revenue growth determines the increase in the accessibility of insurance by the population. And secondly, demand for insurance increases when national income increases.

3. Data and methodology

The study approches a way of analyzing the causality between different types of insurance (gross written premiums for life, non-life and total insurance, noted gwp_life, gwp_non_life and gwp_total) and economic growth (noted gdp) at national level, through the VAR model, respectively the VECM model, as well as the impulse-response function.

The four data series were taken over for 32 years (1984 - 2016) from the official OECD database (life / non-life and total insurance) and Eurostat (GDP growth rate) for three states: Germany, Netherlands and Spain. To model the four variables and to get the relationship of influence between each insurance instrument and economic growth, we will use the Eviews 7 program. The use of cointegration as a case study methodology is motivated by the need to represent long-term causal relationships between insurance instruments and economic growth.

4. Results

In order to analyze the cointegration of data series, we need to study the stationarity of the variables as well as the integration order. Using the Augmented Dickey Fuller test meets both conditions. Further, we will use the ADF test to determine the data series integration order used in the model, and the results of running this test indicate that all four time series are 1st order integrated. The next step is to check the cointegration of each of pairs surveyed, namely: growth rate of GDP and the growth rate of life / general and total life insurance.

Running the VAR model involves selecting the appropriate number of lags for each model, and this was done by considering the Likelihood Ratio, Final Prediction Error, Akaike information criterion, Schwarz information criterion and Hannan-Quinn information criterion.

The next step is to analyze the results of the Johansen Test to illustrate the long-term relationship between each pair of variables analyzed, and for this it is necessary that the data series be non-static but also integrated by the same order, as evidenced by the results of the ADF test.

Johansen's test results indicate that there is a long-term relationship between growth of insurance and economic growth for all analyzed countries: Germany, Netherlands and Spain. After lag selection, the patterns are run by using VAR for data series pairs where we have not observed cointegration relationships, respectively rewriting them as VECM for cointegration.

Table no. 1. VAR / VECM equations

	gdp_gwp_life	gdp_gwp_non_life	gdp_gwp_total
Germany	D(GDP) = C(1)*(GDP(-1) - 0.0193233596636* LIFE(-1) - 2.68500642339) + C(2)*D(GDP(-1)) + C(3)*D(GDP(-2)) + C(4)*D(GDP(-3)) + C(5)*D(LIFE(-1)) + C(6)*D(LIFE(-2)) + C(7)*D(LIFE(-3)) + C(8)	D(GDP) = C(1)*(GDP(-1) - 0.0731488676997*NON_LIFE(-1) - 2.27074586356) + C(2)*D(GDP(-1)) + C(3)*D(GDP(-2)) + C(4)*D(GDP(-3)) + C(5)*D(NON_LIFE(-1)) + C(6)*D(NON_LIFE(-2)) + C(7)*D(NON_LIFE(-3)) + C(8)	D(TOTAL) = C(1)*(TOTAL(-1) - 29.2795102433*GDP(-1) + 75.393703619) + C(2)*D(TOTAL(-1)) + C(3)*D(TOTAL(-2)) + C(4)*D(TOTAL(-3)) + C(5)*D(GDP(-1)) + C(6)*D(GDP(-2)) + C(7)*D(GDP(-3)) + C(8)
Netherlands	D(GDP) = C(1)*(GDP(-1) - 0.360206568268*LIFE(-1) - 1.82318093284) + C(2)*D(GDP(-1)) + C(3)*D(LIFE(-1)) + C(4)	D(GDP) = C(1)*(GDP(-1) - 0.907028877136*NON_LIFE(-1) + 1.0702390582) + C(2)*D(GDP(-1)) + C(3)*D(NON_LIFE(-1)) + C(4)	D(TOTAL) = C(1)*(TOTAL(-1) - 1.8761939178*GDP(-1) + 1.82305146968) + C(2)*D(TOTAL(-1)) + C(3)*D(GDP(-1)) + C(4)
Spain	GDP_SPAIN = C(1)*GDP(-1) + C(2)*GDP(-2) + C(3)*GDP(-3) + C(4)*GDP(-4) + C(5)*LIFE(-1) + C(6)*LIFE(-2) + C(7)*LIFE(-3) + C(8)*LIFE(-4) + C(9)	D(GDP) = C(1)*(GDP(-1) - 0.884116206354*NON_LIFE(-1) + 1.18965317417) + C(2)*D(GDP(-1)) + C(3)*D(GDP(-2)) + C(4)*D(GDP(-3)) + C(5)*D(GDP(-4)) + C(6)*D(NON_LIFE(-1)) + C(7)*D(NON_LIF(-2)) + C(8)*D(NON_LIFE(-3)) + C(9)*D(NON_LIFe(-4)) + C(10)	D(GDP) = C(1)*(GDP(-1) - 0.557100513337*TOTAL(-1) - 0.919519549106) + C(2)*D(GDP(-1)) + C(3)*D(GDP(-2)) + C(4)*D(GDP(-3)) + C(5)*D(GDP(-4)) + C(6)*D(TOTAL(-1)) + C(7)*D(TOTAL(-2)) + C(8)*D(TOTAL(-3)) + C(9)*D(TOTAL(-4)) + C(10)

For Germany, the first C(1) negative coefficient (-1.0769) with a significant probability (0.0156), indicates the existence of a causal relationship between the insurance sector and economic growth.. The coefficients obtained for the models ran for Netherlands determine that we can state the presence of causality from insurance to macroeconomic growth in the long run. With respect to models ran for Spain, we have obtained the causality of insurance on long-term economic growth.
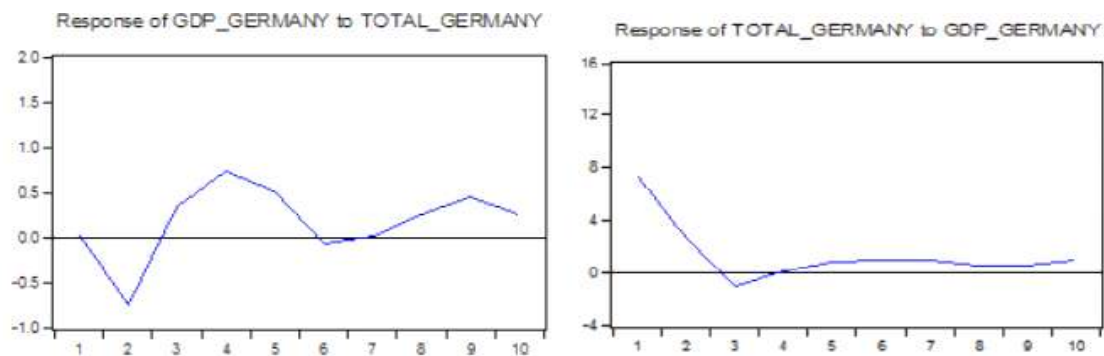

Figure no. 1. **Impulse – response function for Germany**

For Germany, the graphs indicate major differences between each other; in the first case, the positive impact of insurance on the growth rate of GDP determines a decrease in macroeconomic progress in the first two periods and further the trend fluctuates and also an impulse given by total insurance leads to a slightly decrease of economic growth, followed by a constant trend.
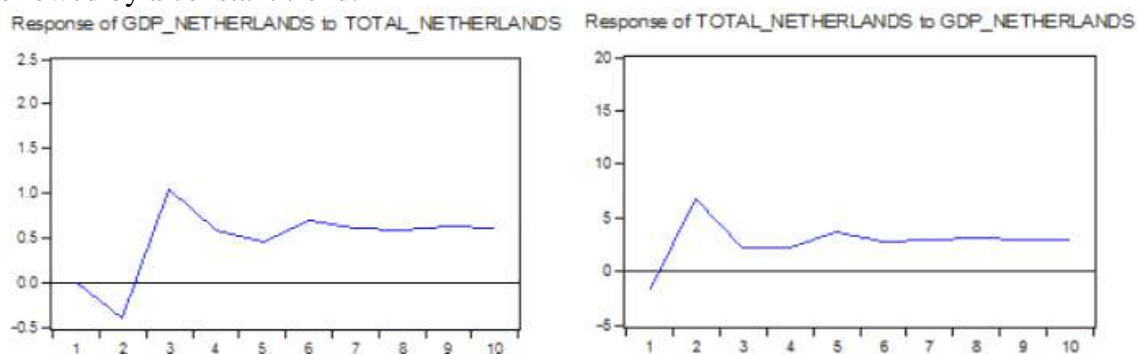

Figure no. 2. **Impulse – response function for Netherlands**

For the Netherlands' economy, the economic growth trend in response to the impact given to total insurance is initially declining (periods 1 to 2), and then increases until the third period ending with a steady trajectory until the last period. A similar trajectory is also observed in the case of the insurance response to the rising impact of GDP growth.
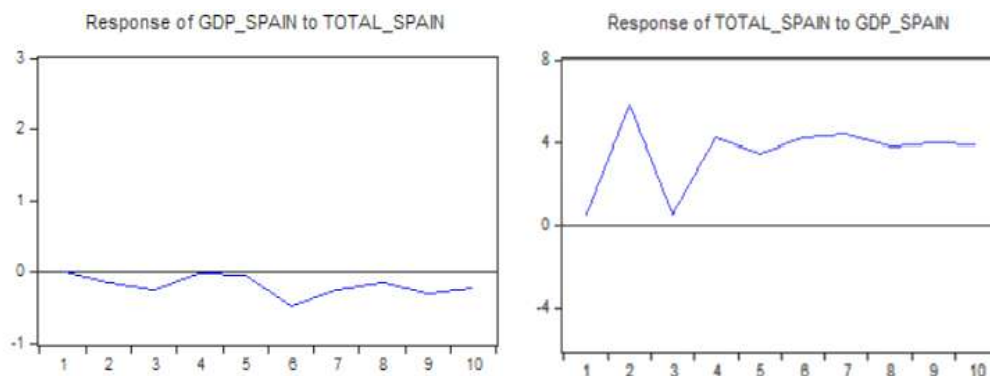
Figure no. 3. Impulse – response function for Spain

In the case of Spain, a positive influence of insurance is quantified in the economic growth turbulence by successive passes from rises to rhythm cuts. The same trend can be seen in the first periods (1 - 4) of the graphical representation of the positive impact of the growth rate of GDP on insurance field, but starting with the 4th period, the total insurance trend as a response to the positive influence of the economic growth is maintained at a level constantly of four units.

Table no. 2 Selection of statistically significant resultsof the Granger test

	Null hypothesis	Prob
Spain	DGDP does not Granger Cause DNON_LIFE	**0.0092**
Germany	DTOTAL does not Granger Cause DGDP	**0.0264**
	DNON_LIFE does not Granger Cause DGDP	**0.0322**

We note the lack of favorable outcomes for the Netherlands' economy, for which we have not identified causal relationships between the growth rate of GDP and that of insurance. So Granger's test results have proven to be similar to those obtained by Horng (2012), respectively that economic growth determines Granger's insurance causality.

It is important to emphasize the significant number of equations for which we have acquired causality, most of them starting from the economic growth to insurance growth, which supports the hypothesis that a developed economy leads to the development and progress of the insurance sector, namely the "demand - tracking". Thus, we can say that an increase of the national income leads to an increase of the demand for financial services, which further determines the necessity of expanding and developing the insurance sector.

5. Conclusions

The analysis of the entire set of results for all three states included in the study indicates the causal relationship between insurance and economic growth. Thus, in Spain, we have causal relationships from economic growth to insurance, and in Germany and the Netherlands the causality is manifested by insurance to GDP growth.

Thus, as the economist Liedtcke (2007) determined in his own study, insurance should not be considered by potential insured as an unnecessary expense, but as an effective form of protection and saving of resources.

The significant number of unidirectional and bidirectional causal relationships between economic growth and insurance indicates the possibility of using them in order to increase the growth rate of GDP but also the development opportunity that this sector presents in the macroeconomic context of a state. However, the causal relationship

between insurances and economic growth can be observed, influences that depend on a number of factors ranging from state to state, explained by Liedtcke (2007) in his research paper.

By comparing the results obtained with those already identified whitin the empirical literature, we obtained both the causal relations from insurance to economic growth, such as the study by Haiss and Sümegi (2008), but also the reverse causality relations from the growth rate of GDP to the insurance sector, coincides with the conclusions of Adams and colleagues (2009), as well as those demonstrated by Hussels, Ward and Zurbruegg (2005).

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