EMPIRICAL STUDY OF DEMAND SIDE SECTORS AFFECTING DISASTER RELATED INSURANCE PRODUCTS DEVELOPEMENT IN ALBANIA

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Abstract: Due to the enormous impact the insurance industry has on a nation's economic growth, this research aims to investigate the economic factors that incite demand for insurance goods in Albania. This discussion is performed in the framework of disaster risk management policies and financial instruments used for this purpose. The authors looked at the economic drivers of the Albanian insurance industry from 2009 to 2020 using quarterly data and density insurance as a proxy for non-life insurance market demand. The empirical findings show that GDP per capita had the greatest influence, whilst unemployment was found to have little effect on non-life insurance density. The findings, which largely concur with empirical research, are useful to both academics and insurance industry professionals. The findings explore the reasons why disaster related insurance products is limited in Albania.

Key words: Insurance, disaster, risk, Albania, economic factors

1. INTRODUCTION

The insurance industry is one of the oldest in the financial sector, with over 400 years of experience. The contribution of insurance to lessen financial instability for consumers and business has been widely recognized. Apart from that, the emerging market benefits from insurance as it also contributes to alleviating poverty and to enabling inclusive increase [33]. No matter how challenging is to estimate its values, the findings confirm that through its ex-ante risk management, insurance contributes to a better distribution of resources, to the improvement of trade and to promoting risk management. On the other hand, insurance enables the whole society to get over serious shocks faster through the ex-post protection. The above-mentioned benefits from insurance pertain in both advanced and emerging markets.

In line with these observations, this paper will discuss the role of the insurance sector in lowering the exposure in case of disasters, focusing on the factors affecting the development of the sector, in particular on the demand side. The first part of the paper discusses the criteria that a risk must fulfill in order to be eligible for insurance. The second part of the paper explores the demand side barriers that the sector faces. The reminder of the paper summarized the results of an empirical study conducted in Albania, which aims at identifying the demand side factors affecting non-life insurance demand.

2. INSURANCE IN CASE OF DISASTERS

There are some requirements that should be fulfilled before a pure risk can be privately insured **Error! Reference source not found.**.

There must be a sufficiently large number of similar exposure units. Insurers use the law of large number to predict probable losses. Therefore, it is essential that a large number of independent and similar, not necessarily identical, units be exposed at the same peril. To be successful, an insurance plan must reduce the risk by making losses predictable within certain ranges of accuracy. According to the law of large number, as the number of exposure units increases, the more certain is that actual loss experience with equal probable loss experience. The insurance is the device through which the objective risk is significantly decreased.

The loss must be accidental and unintentional. The loss must be result of a contingency i.e. there must be some uncertainty surrounding the loss. Otherwise, there would be no risk. If there is no risk, insurance would be worthless, as its purpose is to reduce the risk. The loss should be beyond the

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control of the insured. To satisfy this requirement, insurers usually exclude in all policies any loss caused intentionally by the insured.

The loss should be definite and measurable. The loss must be definite in time, cause, place and amount. Most losses are easily determined with reasonable accuracy, such as death, property losses etc. However, some losses are difficult to be determined such as disability or sickness, and some others are difficult to be measured such as the loss from "pain and suffering".

The loss should not be catastrophic. A large number of units must be exposed at the same peril, but not all or the most part of the exposed units should suffer from the loss at the same time. Catastrophic loss exposure is defined as a potential loss that is unpredictable and capable of producing an extraordinarily large amount of damage relative to the assets held in the insurance pool **Error! Reference source not found.**. The insurance principle is based on the notion of sharing losses. If all the exposure units in a certain class incur a loss at the same time, the pooling will not work, and the insurance will be no longer an effective technique.

The chance of loss must be calculable. The insurer must be able to calculate the probability of loss. Some probabilities of loss can be determined by logic alone (by deductive reasoning), for example the probability of rolling a six with a single die is 1/6. Other losses must be empirically determined (by indicative reasoning), for example the probability that a person age 30 will die before the age 50. If no statistics on the chance of loss are available, the degree of accuracy of the insurer's calculation would be low, despite the large number of insureds.

According to the above classification, the natural disaster risk is:

- a pure risk as the society does not benefit when a natural disaster loss occurs, i.e. insurable risk;
- a static risk as it occurs due to random events and it is not a source of gain for the society, i.e. insurable risk;
- a fundamental risk as it affects a large group of population, i.e. not entirely privately insurable.

When a natural disaster takes place, often it is very difficult to measure the amount of loss, or at least the actual loss can be measured only after a certain time period. As the "catastrophe" is the synonym of disaster, the loss resulted from the natural disasters is catastrophic. The natural disasters occur in irregular basis therefore their probability cannot be accurately estimated. As result the natural disaster risk does not fully satisfy the requirements of an insurable risk **Error! Reference source not found.**. Although these requirements represent the ideal, in practice, insurance is written under less-than-ideal conditions. However private insurance ventures that depart too far from the ideal are likely to fail **Error! Reference source not found.**.

The insurance companies would ideally wish to avoid the catastrophic losses because they are unpredictable, the loss distribution is hardly to be evaluated, and the rate making process is very difficult. Currently, insurance companies provide coverage for catastrophic losses, natural catastrophes and man-made disasters. Financiers have developed arrangements that provide protection to insurance companies faced with catastrophic losses. That means that insurance companies have found a way to use the resources of the financial market to meet the problem of catastrophic losses. There are at least three basic methods that allow them to accept exposures that otherwise would have been refused: reinsurance, distribution of insurance coverage over a large geographical area, and use of financial market products for transferring the risk **Error! Reference source not found.**.

According to the Swiss Re Sigma (2023) publication**Error! Reference source not found.**, economic losses from natural catastrophes and man-made disasters across the world were estimated USD 275 billion in 2022. Natural catastrophe-related economic losses were estimated USD 125 billion in 2022 coming mostly from extreme weather events. Insurance coverage is not universal. There was an all-peril catastrophic protection gap of USD 150 billion in 2022. Therefore, the insurance industry covered about USD 125 billion - less than half - of the economic losses in 2022. Figure 1 shows the difference between insured and economic losses over time, termed the insurance protection gap. The rate of growth of economic losses has outpaced the rate of growth of insuring losses over the 25 past

years. In terms of 10 rolling averages, insured losses grew by 4,6% between 1991 and 2016, and economic losses by 5,6% [4].

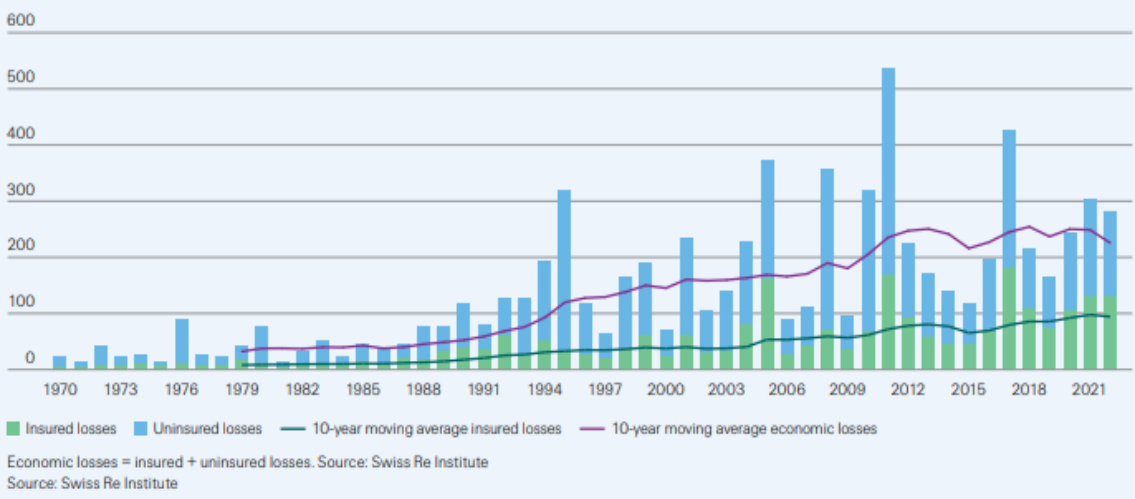

Figure 1. Insured losses versus uninsured losses, "Sigma"

3. BARRIERS CAUSED BY DEMAND CONCERNING INSURANCE

There are various barriers caused by demand that have caused less efficiency in the insurance markets in developing nations compared to developed ones. The benefit of insurance and the cost of providing insurance are related to that extent that when the former gets higher so does the latter. In the emerging market framework eight relevant barriers, summarized by Swiss Re Institute (2017), have been identified. Also, Savitt (2017) evaluates the literature about hazard insurance availability and purchase and the challenges of insurability in case of disasters [5]. A total of 70 articles were included in his study, elaborating more on the demand and supply side barriers that the insurance market face when dealing with disaster events.

Income has been found to be the most important factor affecting the level of the insurance market development in almost all the previous research work. It is generally accepted that the higher a country's income is, the more affordable the insurance products will be and the higher the demand for both types of insurance will be, life and non-life ones, as the human capital grows at the same time. Furthermore, the authors Lee and Chiu [6] state that the income elasticities of life and non-life insurance premiums are respectively less and larger than 1, implying that life insurance is a necessary good, and non-life insurance is a luxury good.

There is a negative correlation between the price of goods and demand for them. Demand falls as prices rise. Yet in emerging markets demand for insurance remains very low even when subsidies are provided [7].Few academics take inflation into account when predicting non-life insurance consumption. It is widely acknowledged that inflation reduces the demand for insurance. Due to rising prices for products and services, inflation has an impact on non-life insurance by raising the number of claims. While Poposki and Kjosevski [8] concluded that inflation is not highly significant, Yuan and Yu [9] discovered that variations in non-life insurance premiums are adversely correlated with the inflation rate.

Liquidity constraints remain a concern which refrain consumers from purchasing insurance. Lack of finance is one of the most serious barriers for consumers as individuals (ex. farmers), for small and even medium enterprises in emerging markets [10].

Novović et al., [11] in the Western Balkan countries, confirm that a higher unemployment rate of a country has a negative impact on the demand for insurance, which is justified by the decline in the economic activities and standard of living.

Other barriers related to non-economic factors include trust factors, awareness, behaviour biases, cultural factors, psychological characteristics, Risk preferences and perception, and demographic characteristics.

4. EMPIRICAL STUDY

4.1. Data and methodology

In contrast with developed countries, the non-life insurance sector in Albania is still underdeveloped, and significantly below the average of the European Union (EU) member states. On average, in 2019 an EU citizen spent USD 1,300 for the life insurance sector and USD 1,074 for the products of the non-life insurance sector [12]. In 2019, an Albanian citizen spent on average USD 56 (the authors‘ calculation) on insurance products, and only seven percent [13] out of this amount was spent on life insurance products.

We have analyzed the economic factors that impact non-life insurance demand in Albania using a Vector Error Correction Model. Following established procedures, we have conducted the test of relationship between non-life insurance with selected economic factors in three stages. Initially we tested the order of integration in the selected variables. We have used the Augmented Dickey Fuller (ADF) to test for unit roots [14]. Secondly, to examine the long-run relationships among the variables we have used cointegration. Lastly, after establishing the existence and order of cointegration, we have estimated a VECM and examined the cointegrating vector and the speed of adjustments of the parameters.

The dependent variable included in the study is the non-life insurance density (NID) which is defined as per capita premium expenditure and it describes how much each inhabitant of a country spends on average on non-life insurance, expressed in U.S dollars. In our regression models NID are used in the logarithmic form.

The economic factors that we have used as control variables in this study are GDP, inflation, real interest rate and unemployment. The dependent variables, the explanatory variables and the data sources used in our study and the expected signs of the regression coefficients for the independent variables are summarized in Table 1.

We have focused on the period from the first quarter of 2009 to the fourth quarter of 2020. Considering the nature of the methods used in time series analysis and the nature of the insurance market in Albania, we included quarterly data, as annual data would mean having very few observations available for an efficient estimation. On the other hand, although the insurance market has long since been established, it is not until the past decade that it began to properly develop.

Table 1. Definitions of variables

Variable name and definition of variables	Source of data	The expected signs of the regression coefficients for the independent variables
Ln (LID)-Natural logarithm of Life Insurance Density	National Insurance Supervisory Authorities and Swiss Re	
Ln (NID)-Natural logarithm of Non-Life Insurance Density -	National Insurance Supervisory Authorities and Swiss Re	
Ln (GDPpc)-Natural logarithm of GDP per capita (current US$)	Albanian Institute of Statistics	Positive
INFL- Inflation rate (%)	Albanian Institute of Statistics	Negative
INT- Real interest rate (%)	Albanian Institute of Statistics	Negative
UNEMP- Unemployment, total (% of total labour force) (national estimate)	Albanian Institute of Statistics	Negative

Table 2 shows the descriptive statistics of the variables considered in the model. As we observe from the data shown in the Table 2, among the dependent variables, non-life insurance density has a higher fluctuation than life insurance density, respectively with a standard deviation of 0.3653 and 0.2071. Among the independent variables, unemployment has the highest value of standard deviation.

***Table 2**. Descriptive statistics of variables*

Variable Name	Mean	Std. Dev	Min	Max
Ln (NID)	6.8403	0.3653	6.2507	7.3572
Ln (GDPpc)	6.9121	0.1246	6.6551	7.1165
INFL	2.0972	0.8025	0.6667	4.3667
INT	4.0172	1.3156	2.2856	6.6982
UNEMP	14.0383	1.9835	11.2	18.2

4.2. Empirical results

Estimating VECM for the model, long run equation is as follows:

$\ln(NID)_{t-1}$ = 7.318078 + 0.4494 $\ln(GDDpc)_{t-1}$ - 0.0122 Unempt-1 - 0.2383 Intt-1 - 0.0195 Inflt-1 (2)

In the model, only two variables are significant at 5% level, specifically GDP per capita and real interest rate. Here a 1% increase in GPD per capita will lead to a 0.44% increase in non-life insurance density. Also, a 1 percentage point increase in the real interest rate, will lead to a 0.23% decrease in life insurance density. Table 3 represents the short-run estimates of the VECM. Even in this case the system has a high speed of adjustment towards the long-run equilibrium. Results show that the previous year deviation of economic growth from the long run equilibrium is corrected in the current period at a speed of 83.8% and statistically significant a 1% level.

We have run post estimation tests checking for the model stability. Particularly we tested for autocorrelation, normality and heteroscedasticity. The LM test for serial correlation could not reject the null hypothesis of no serial correlation for half of the lags and at 5% level of significance in both models, suggesting that they have some autocorrelation problems. The Jarque-Bera test for normality shows that at 5% level of significance we cannot reject the null hypothesis, so suggesting that the residuals are normally distributed for both models. The heteroscedasticity test that at 5% level of significance we fail to reject the null hypothesis of constant variance, so both models do not suffer heteroskedasticity. From the tests, we have concluded that the findings of the models are relatively robust.

Table 3**. VECM estimates: non-life insurance density model**Error! Bookmark not defined.

	(1)	(2)	(3)	(4)	(5)
Variables	$\Delta\ln(LID)_t$	$\Delta\ln(GDPpc)_t$	$\Delta Unemp_t$	ΔInt_t	$\Delta Infl_t$
ECT_{t-1}	-0.838412**	0.010015	-1.132886	-0.021214	-0.550749
	(0.19904)	(0.04463)	(0.83294)	(0.63770)	(0.89118)
$\Delta\ln(NID)_{t-1}$	-0.012621	0.033817	1.198732*	-0.368635	0.065492
	(0.15594)	(0.03496)	(0.65260)	(0.49963)	(0.69823)
$\Delta\ln(GDPpc)_{t-1}$	-0.273845	-0.202146	2.284710	-0.252863	-1.623264
	(0.71563)	(0.16045)	(2.99480)	(2.29282)	(3.20421)
$\Delta Unemp_{t-1}$	-0.086501*	-0.001850	0.242701	-0.005095	-0.236703
	(0.04041)	(0.00906)	(0.16912)	(0.12948)	(0.18095)
ΔInt_{t-1}	0.034606	0.011861	0.279740	-0.516510*	0.019798
	(0.05001)	(0.01121)	(0.20927)	(0.16021)	(0.22390)
$\Delta Infl_{t-1}$	0.071283*	-0.001853	0.013049	0.002421	0.065504
	(0.04065)	(0.00979)	(0.18269)	(0.13987)	(0.19546)
Constant	0.022661	0.011242*	-0.029835	-0.119350*	-0.001242
	(0.02063)	(0.00463)	(0.08633)	(0.06609)	(0.09236)
Observations	46	46	46	46	46
R-squared	0.368594	0.117567	0.149904	0.262733	0.046195

** p<0.01, * p<0.05; Standard errors are shown in parenthesis

5. DISCUSSIONS AND CONCLUSIONS

Disaster events are the source of highly complex risks and that is the reason why the concept of insuring the risks is very challenging. Based on the evaluation of the literature, a short overview on the barriers of insurability in cases of disasters was presented. The Albanian market is used as a framework for this discusion.

The financial system of Albania is a bank-based system, partially due to the inheritance from the past (up to 1991), when the only financial institution familiar to the public was the Savings Bank. Until 1999 the insurance activity was performed by the sole state insurance company. After the licensing of the first private insurance companies (1999), improvement of the insurance legal framework and participation of foreign capital, the insurance market in Albania has gradually progressed. Actually, it is still dominated by the non-life insurance sector, where the "Motor third party liability" accounts for the major part of the total gross written premiums. As the literature suggests, insurance market has a significant role in the macroeconomic activity through: (i) its role in providing security and indemnification; and (ii) its role as an institutional investor [15]. Due to the significance the insurance market has for economic development, this paper has examined some of the economic factors that according to literature would influence the development of the Albanian insurance market. The factors addressed in our paper are: economic growth, inflation rate, real interest rate and unemployment.

Without doubt, economic growth and increase of incomes have a positive impact on both life and non-life insurance market, showing that income is the most significant determinant in the insurance industry. The result is consistent with all the previous empirical work in developed and developing countries.

According to Hofflander [7] the anticipated future inflation may change the pattern of insurances purchase, with more term insurance being purchased and less permanent insurance. Regarding the non-life insurance market in Albania, inflation resulted as insignificant to gross written premiums supporting the findings of Poposki &Kjosevski, [8] for emerging economies.

Regarding the interest rate impact on non-life insurance, the results are in conformity with the previous empirical studies and the theory frame as well – showing a negative impact of interest rate on non-life insurance as expected.

Unemployment rate resulted statistically non-significant on non-life insurance consumption in Albania measured by density. Our findings do not corroborate the earlier studies which show that a higher unemployment rate for a country has a negative impact on the demand for insurance, which is justified by the decline in economic activities and standard of living. One possible explanation may be that the effect of employment on insurance demand is mainly reflected through the income variable. Furthermore, it can be assumed that employment has maintained an indirect relationship with insurance demand since the development in the insurance market in Albania is not correlated with the unemployment rates which were higher in the beginning of 2000 and then declined when new policies in the insurance market were introduced.

At the end, we have concluded that the results are mostly in accordance with the prior empirical researches. The paper suggests that the insurance companies should monitor and evaluate these factors in order to increase and improve insurance service for non life insurance products related to disaster risk management strategies. The results encourage the insurance companies to develop more sophisticated insurance products. This study considers the insurance density indexes as the proxy of non-life insurance consumption. Further studies may be extended to other proxies such as insurance growth index or insurance penetration. When more data become available, it would be useful to take a much bigger sample concerning periods or other determinants such as demographic, institutional and cultural factors which would lead to a greater understanding and knowledge of determinants of life and non-life insurance demand in Albania.

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