THE ROLE OF INSTITUTIONAL FACTORS OVER THE NATIONAL INSURANCE DEMAND: THEORETICAL APPROACH AND ECONOMETRIC ESTIMATIONS

Simona-Laura DRAGOŞ
Cristian-Mihai DRAGOŞ

Simona-Laura DRAGOŞ
Lecturer, Faculty of Economic Sciences and Business Administration, Babeş-Bolyai University, Cluj-Napoca, Romania; Laboratory of Economics Orléans (LEO), Orléans University, France
Tel. : 0040-264-418.654.
E-mail: simona.dragos@econ.ubbcluj.ro

Cristian-Mihai DRAGOŞ
Associate Professor, Faculty of Economic Sciences and Business Administration, Babeş-Bolyai University, Cluj-Napoca, Romania; Laboratory of Economics Orléans (LEO), Orléans University, France
Tel. : 0040-264-418.654.
E-mail: cristian.dragos@econ.ubbcluj.ro

Abstract

The insurance sector becomes a more and more important component for the national economic and financial development. Nevertheless, the consumption and the density, both for life and non-life insurances, reveal a great variation across countries. Academic literature treats frequently the importance of the economic and demographic factors. This study evaluates the determining institutional factors of the insurance demand using OLS Multiple Regressions models on a sample of 31 European countries. The econometric estimates, according to the theory, show that a country's level of corruption is decisive for the development of the non-life insurances. For the life insurances, business freedom, fiscal freedom and government spending are the most relevant explanatory variables. The article emphasizes the mechanism through which the significant institutional factors influence the insurance density from a country.

Keywords: institutional factors, insurance demand.

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1. Introduction

The importance of insurance for the economic and financial development of a country led us to explore the main economic, demographic and institutional factors that influence the development of the insurance sector, including both life and non-life sector. The paper contributes to the body of the existing research by the extensive econometrical analysis of the influence of the institutional factor over the demand for life and non-life insurances. In spite of the growing interest on the topic, the influence of the institutional factors has not been analyzed empirically as widely as would have been expected because of the lack of reliable indicators. Recently, the availability of significant data regarding the measurement of the institutional factors enabled the analysis of these critical elements. In order to measure the insurance demand we use the insurance density, which is defined as premiums per capita. This ratio shows how much each inhabitant of a country spends on insurance on average, expressed in constant dollars.

The economic literature often treats the role of economic and demographic variables on the insurance sector. Starting from those studies, our article considers the results of previous researches as axioms. The main objective of this study is to formulate and validate original hypothesis over the role of institutional variables at macroeconomic level. Through theoretical and empirical investigation we explain the different role of institutional factors over the non-life insurances comparatively to the life insurances.

The structure of this paper is organized as follows: Section 2 reviews previous studies on the economic and demographic factors influencing the insurance demand, Section 3 discuss the correlation between insurance demand and the institutional factors for the two lines of business, Section 4 describes the research hypotheses, methodology and data used in this paper, Section 5 reports the empirical findings of the study and Section 6 provides the conclusions.

2. Economic and demographic factors influencing insurance demand

Previous studies have exhaustively evaluated the determining economic and demographic factors of the insurance demand. In this paragraph we mention some of those studies and their results. Beck and Webb (2003) found a positive correlation between the life insurance demand and the following demographic factors: schooling, urbanization, life expectancy, while religion was founded to have a negative effect. Regarding the economic factors they have demonstrated that the banking sector development and the income influence positively the life insurance density, while inflation rate has an opposite effect.

Income is an essential variable in the models of insurance demand. Higher income is expected to increase the demand for life insurance because of a greater affordability of life insurance products, especially for the higher risk products - Dragos and Dragos (2009). Another reason is the need to safeguard the potential income of the children against the premature death of the employed individual – Feyen, Lester and Rocha

(2011). The studies of Browne and Kim (1993), Outreville (1996) and Doughui *et al.* (2007) conclude that income (measured by per capita income) has a positive and significant effect on life insurance premiums. Beenstock, Dickinson and Khajuria (1986) conclude that income has a positive impact on life insurance demand and Beenstock, Dickinson and Khajuria (1988) similarly find a positive relationship between income and expenses for property-liability insurance.

Inflation should have a negative impact on the demand for life insurance, as it diminishes the value of insurance policies and makes them less attractive – Feyen, Lester and Rocha (2011). Previous studies find a negative and significant relationship between inflation and the life insurance premiums - Browne and Kim (1993), Outreville (1996), Doughui *et al.* (2007).

A higher life expectancy in a society can be interpreted in lower mortality coverage charges, reduced need for mortality coverage, but in higher savings through life insurance products and increased demand for annuities. This is a reason why the opinions regarding the influence of life expectancy on the life insurance demand are diverse. Browne and Kim (1993) found that life expectancy is not a significant influence factor for the life insurance demand but earlier studies have found life expectancy to be positively correlated with life insurance penetration (Beenstock, Dickinson and Khajuria 1986; Outreville 1996). Feyen, Lester and Rocha (2011) found that for a certain level of GNI per capita a growing population indicates more customers for the life insurance companies and greater risk pools which allow them to reduce the insurance prices because of the insurers diminishing costs of risks transfer.

3. Public institutions intervention in the insurance industry

North (1990) has defined the institutions as human created limitations that organize human behavior. One of the main roles of institutions is to diminish uncertainty felt by firms and individuals (Peng, 2000). In consequence, it is probable to influence the actions of people towards insurance consumption choices (e.g. property rights, freedom from corruption, quality of governance, etc.) (Elango and Jones, 2011).

Kessler (2008) considers that the State has the responsibility to guarantee the ability of insurance companies to honor their commitments to the policyholders when losses occur in the future. This supposes the control of the quality of insurance contracts and also the control of the insurance companies' solvency. Haiss and Sumegi (2008) think that life and non-life business has to be regulated separated, meeting formal requirements and setting cross sectorial activities.

Because insurance implies the legal transfer of risk, Esho *et al*. (2004) has shown that the integrity of the contract is dependent upon legal rules and enforcement, the efficiency of conflict resolution through the judiciary, and the stability and integrity of the legislative process.

Feyen, Lester and Rocha (2011) found that life sector develops more rapidly if there is a supportive and legal framework. The variable expressing the Government efficiency in the regulatory process (business freedom) was positive and significant. Beck and Webb (2003) show that if fraud is often present in claims reporting, insurance

becomes excessively expensive for a great part of the population. They use the rule of law index (composed by property rights and freedom from corruption) and find a positive and significant effect meaning that an adequate protection of property rights and an effective enforcement of contracts facilitate the investment function of life insurances. The mechanisms through which property rights and freedom from corruption act in the society are complex and they are emphasized in the academic research not only econometric but also as an economic behavior, through implications over the public-private partnership and connections with bureaucracy in the public services (Ionescu, Lăzăroiu and Iosif, 2012; Mare, 2010).

Knack and Keefer (1995; 2002) have shown that in terms of insurance, the enforcement of property rights generates an economic motivation to purchase and insure property. This phenomenon appears because Governmental and legal enforcement of property rights help to protect individuals from loss or damage to the asset. Esho *et al.* (2004) shows that the legal environment and the protection of property rights support the development of the property-liability insurance market by reducing the costs of the risk transfer transaction.

Regarding Governmental intervention most researchers - see Kim (1988), Meng (1994) and Beck and Webb (2003) - consider that social security schemes provide protection against mortality risk and therefore should affect life insurance demand negatively They postulate that social security displaces private insurance. These social security schemes are part of Governmental expenditures providing income replacement against death and old age and reducing the net disposable income of the population. The public sector is starting to experience increasing financial difficulties because of the population ageing. For lowering the public expenditures Kessler (2008) proposed the solution of placing the social security on the market, in the private sector, for eliminating the least efficient solutions. Kessler (2008) also considers that some problems like adequate coverage of the population, optimal monitoring of insured individuals' behavior, selection of risks and access to information, can be resolved through a combination between the role of insurers and the role of the state.

Brunette *et al*. (2008), Raschky and Weck-Hanneman (2007), Kim and Schlesinger (2005) and Kelly and Kleffner (2003) find that the presence of public compensation programs, which is meant to reduce the financial losses, also removes individual incentives to insure, determining a decrease on the non-life insurance demand. The model developed by Brunette *et al.* (2012) predicts that a fixed public support program will decrease insurance demand and that a subsidy scheme will increase insurance demand. For example the Government might propose a subsidy for the agricultural insurances by using a vulnerability index for natural hazards – Balica (2012).

Nakata and Sawada (2007) explored the determinants of the non-life sector and found that from the variables per capita income, population, Gini coefficient, financial development and contract enforceability only the last one is significant. Browne, Chung and Frees (2000) found that income, wealth, the percent of a country's insurance market controlled by foreign firms, and the form of the legal system in the country

are important in explaining the purchase of property-liability insurance. Using data from a representative sample of 37 countries across the globe Park, Borde and Choi (2000) found that aggregate income and Government regulation have statistically significant effects on the level of insurance pervasiveness (measured as insurance penetration and insurance density).

4. Research hypotheses, methodology and data

4.1. Research hypotheses

Based on previous studies and on the personal empirical observations we consider two axioms (A) regarding the economic and demographic factors and two hypotheses (H) regarding the institutional factors. We expect the insurance demand to grow exponentially in relationship to the majority of the explanatory variables because insurance is a luxury good – Nakata and Sawada (2007), which means that the income elasticity of insurance is larger than unity – also see Beenstock, Dickinson and Khajuria (1988), Outreville (1990) and Enz (2000).

A1. *The economic factors influence more the life insurance density.*

The life insurance density is influenced by the income level as well as by inflation while for the non-life density only the income is likely to be significant. Wasow (1986) argues that the relationship between per capita income and the pervasiveness of life insurance is stronger than the relationship between non-life insurance and per capita income. Inflation has negative effect over the demand for life insurance policies because it makes them less attractive and erodes their value.

A2. *The demographic factors influence more the density of life insurances then the density of non-life insurances.*

Population growth has a positive effect on the life insurance demand because it involves more clients for the life insurance companies. Life expectancy is strongly correlated with the economic factors so an evolution of this indicator means a growth in the quality of life. In the non-life sector a higher life expectancy can be interpreted by a growing demand on motor and property insurances while in the life sector it can lead to a growing demand on annuities.

H1. *The institutional factors influence more the non-life insurance density then the life insurance density.*

The quality of the legal and regulatory environment is expected to have significant influence on market development by increasing the credibility of the insurance contract - Feyen, Lester and Rocha (2011). The Government has the duty to guarantee the successful conclusion of insurance contracts, especially of those contracts made mandatory by law (mostly property-liability insurances).

H2. *The different components of the institutional factors act significantly different in the two groups of insurances.*

Central and local institutions have the role to assure an efficient and ethical functioning of the society and to create a fair incentives system in the private environment.

An important attribute is to settle an agreement between the economic and social interests completed by generating a corporate social responsibility (Dinu, 2011). The complex attributions of the institutions in the society make their efficiency to be different from a domain to another. In this study we are explicitly interested in the action of certain institutional factors over the demand of life and non-life insurance.

4.2. Methodology

For testing the enounced hypothesis we use the econometric linear models like:

$$y_i = b_0 + b_1 x_{1i} + b_2 x_{2i} + ... + b_k x_{k} + \varepsilon_i \qquad i = 1,..., N$$

i indexes the countries from the sample
y_i the endogenous variable for country i
x_{ki} the exogenous variable k for the country i

In order to estimate the coefficients b_0, b_1, ... , b_k we use OLS regressions for a cross-section of countries.

4.3. Data and variables

The data consists in the values made public by the World Bank (2012) through its Statistics Bureau, in the section Indicators, topics Economic Policy and External Debt, Health and Private Sector. For the institutional factors we have used the Index of Economic Freedom (IEF) published by Heritage Foundations and the Wall Street. This index represents a good proxy that reflects the degree of regulation within the insurance industry because it contains information about foreign investment restrictions, government intervention in the private sector, and regulations on banking and insurance. The data for the density of life and non-life insurances were collected from Insurance Europe in the sections Statistical Series - Ratio Indicators. Figures were collected for the period 2006 – 2010 for 31 European countries (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom).

The variables used in the model are presented below:

a) Endogenous variables

NONLIFED

Insurance non-life density is calculated as the ratio of gross written premiums for the non-life line of business to total population.

LIFED

Insurance life density is calculated as the ratio of gross written premiums for the life insurance to total population.

b) Exogenous variables

b1) Economic variables

GNI_cap

GNI per capita, PPP (current international $). PPP GNI is gross national income (GNI) converted to international dollars using purchasing power parity (PPP) rates.

INFL_def

Inflation, GDP deflator (annual %). Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole.

In the empirical studies cited in the previous paragraph are introduced other economic variables like *Services - value added (% of GDP)*, *Merchandise trade (% of GDP)* or *GDP growth (annual %).* These are strongly correlated with the explanatory economic variables introduced in our study and their addition determines an insignificant increase for R^2.

b2) Demographic variables

POP_growth

Population growth (annual %). Population growth (annual %) is the exponential rate of growth of midyear population from year t-1 to t, expressed as a percentage.

In some studies is used the explanatory variable *Life expectancy at birth*. Yet, it is strongly correlated with *GNI_cap*, so its introduction does not significantly improve the econometric model.

b3) Institutional variables

In a free economy, persons are free to work, produce, consume, and invest as they want, with that freedom protected and unrestricted by the state. We have taken into consideration seven institutional variables, assigning a grade scale from 0 to 100, where 100 represent the maximum freedom.

PROPERTY

Property rights. The property rights component is an assessment of the ability of individuals to accumulate private property, secured by clear laws that are fully enforced by the state. The property rights score for each country is a number between 0 and 100, the more certain the legal protection of property, the higher the score of a country is.

BUSINESS

Business freedom. Business freedom is a quantitative measure of the ability to start, operate, and close a business that represents the overall burden of regulation as well as the efficiency of Government in the regulatory process. The business freedom score for each country is a number between 0 and 100, with 100 equaling the freest business environment.

FISCAL

Fiscal freedom. Fiscal freedom is a measure of the tax burden imposed by Government. It includes both the direct tax burden in terms of the *top tax rates on individual*

and *corporate incomes* and the *overall amount of tax revenue* as a percentage of GDP. In scoring fiscal freedom, the underlined numerical variables are weighted equally as one-third of the component.

GOUV

Government Spending. This component considers the level of Government expenditures as a percentage of GDP. The methodology treats zero Government spending as the benchmark. The scale for scoring Government spending is non-linear, only really large Government spending - for example over 58 percent of GDP - receives the score of zero.

CORRUPTION

Freedom from corruption. Freedom from corruption is based on a scale of 0 to 100 in which a score of 100 indicates very little corruption and a score of 0 indicates a very corrupt Government. The higher the level of corruption the lower the score of the country is.

FINANCIAL

Financial freedom. Financial freedom is a measure of banking efficiency as well as a measure of independence from Government control and interference in the financial sector. An overall score on a scale of *0 - Repressive. Supervision and regulation prohibit private financial institutions* - to *100 - Negligible government interference* - is given to an economy's financial freedom.

OVERALL

Overall score. Represents a compound indicator which includes the fore-cited institutional factors plus *Labour Freedom*, *Monetary Freedom*, *Trade Freedom* and *Investment Freedom*.

5. Results and discussions

So to test the H1 hypothesis, we try to explain the values of the life and non-life insurance density only on the basis of institutional variables (Table 1 and Figure 1). For avoiding the multicolinearity problems, we use as explanatory variable only the OVERALL indicator. According to the economic theory, the insurance density has a greater than unity elasticity in connection to the influential factors. In consequence, we use in regressions the square root of insurance density, respective the variables *sqrtNONLIFED* si *sqrtLIFED.*

The estimation results totally confirm the *H1* hypothesis. For each of the years 2006, 2007, 2008, 2009 and 2010, the institutional variables explain better the non-life insurance density than the life insurance density (R^2 greater each year). Moreover we remark an interesting phenomenon in the years 2008 (beginning of the economic crisis for some European countries) and 2009 (confirmation of the crisis all around Europe). The values of R^2 are smaller than in others years. This means that in the period of crisis the importance of economic factors perceived at microeconomic level raised

(population earnings) in detriment of the factors perceived at macroeconomic level (institutional quality variables).

Table 1: OLS regressions of the *OVERALL* indicator on the *sqrtNONLIFED* and *sqrtLIFED* variables (t-values between parentheses)

	NONLIFED 2006	*NONLIFED 2007*	*NONLIFED 2008*	*NONLIFED 2009*	*NONLIFED 2010*
OVERALL	1.037***(4.74)	0.920***(4.29)	0.939***(4.11)	1.002***(4.07)	1.303***(4.42)
Constant	-47.45***(-3.16)	-39.11***(-2.65)	-40.96***(-2.58)	-45.87** (-2.67)	-66.50***(-3.23)
	R^2 = 0.437	R^2 = 0.389	R^2 = 0.369	R^2 =0.363	R^2 = 0.403
	LIFED 2006	*LIFED 2007*	*LIFED 2008*	*LIFED 2009*	*LIFED 2010*
OVERALL	1.409***(4.05)	1.424***(3.99)	1.376***(3.89)	1.367***(3.70)	1.830***(4.05)
Constant	-71.03***(-2.97)	-71.13***(-2.89)	-69.17***(-2.81)	-69.04** (-2.68)	-99.61***(-3.16)
	R^2 = 0.361	R^2 = 0.354	R^2 = 0.343	R^2 =0.320	R^2 = 0.362

***, **, * significant at 1%, 5% and 10% level

Source: Own calculations using STATA 9.1 software

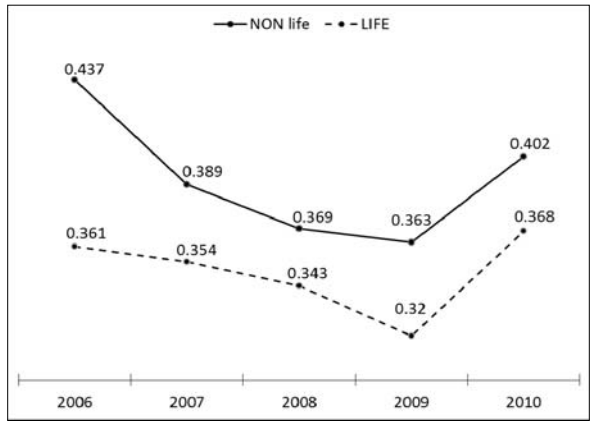

Figure 1: Comparative evolution of the R^2 values from regressions

According to the economic theory and empirical observations, the influence of the institutional factors seems to be different for the two lines of insurance businesses. Consequently, these factors justify a separate analysis as it postulates the *H2* hypothesis. For testing the *H2* hypothesis we carry out the regressions for every institutional variable in part (Table 2 and Table 3). Their simultaneous use causes multicolinearity problems. Regressions were carried out only for the year 2010. Without presenting all the estimations we mention that in the other years the results were similar.

In accordance with the results of the regressions, CORRUPTION is the only variable for which we can prove that it is positively significant (for a p-value < 0.05). Corruption erodes economic freedom by introducing insecurity and uncertainty into economic relationships. Freedom from corruption indicator settles the countries from a low level of corruption (0) until a very corrupt Government (100). The higher the

level of corruption, the lower the level of overall economic freedom and the lower a score of a country is. If a country has a low level of corruption so if there is freedom from corruption in that country the density of non-life insurances will grow.

Table 2: OLS regressions of the institutional factors on the *sqrtNONLIFED* variable
(t-values between parentheses)

	NONLIFED	*NONLIFED*	*NONLIFED*	*NONLIFED*	*NONLIFED*	*NONLIFED*
GNI_cap	0.001***(4.06)	0.001***(5.28)	0.001***(5.05)	0.001***(5.93)	0.001***(2.98)	0.001***(5.73)
INFL_def	-0.497 (-0.89)	-0.573 (-1.02)	-0.524 (-0.95)	-0.541 (-0.96)	-0.505 (-0.98)	-0.405 (-0.69)
POP_growth	-2.784 (-0.92)	-2.467 (-0.78)	-2.872 (-0.95)	-2.669 (-0.82)	-1.492 (-0.52)	-3.189 (-1.05)
PROPERTY	0.117 (1.11)	-	-	-	-	-
BUSINESS	-	0.111 (0.78)	-	-	-	-
FISCAL	-	-	-0.120 (-1.05)	-	-	-
GOUV	-	-	-	-0.034 (-0.39)	-	-
CORRUPTION	-	-	-	-	0.254** (2.38)	-
FINANCIAL	-	-	-	-	-	0.106 (0.82)
Constant	-6.677 (-1.26)	-9.706 (-0.98)	8.069 (0.74)	-0.498 (-0.08)	-9.240* (-2.04)	-8.368 (-1.04)
	R^2 = 0.733	R^2 = 0.726	R^2 = 0.731	R^2 = 0.722	R^2 = 0.770	R^2 = 0.727

***, **, * *significant at 1%, 5% and 10% level*

Source: Own calculations using STATA 9.1 software

Table 3: OLS regressions of the institutional factors on the *sqrtLIFED* variable
(t-values between parentheses)

	LIFED	*LIFED*	*LIFED*	*LIFED*	*LIFED*	*LIFED*
GNI_cap	0.001***(3.47)	0.001***(4.25)	0.001***(4.19)	0.001***(5.04)	0.001***(3.07)	0.001***(5.00)
INFL_def	-2.142***(-2.93)	-2.336***(-3.55)	-2.169***(-3.09)	-2.195***(-3.25)	-2.182***(-2.98)	-1.955**(-2.56)
POP_growth	4.620 (1.16)	6.813* (1.84)	4.677 (1.22)	7.317* (1.88)	5.303 (1.30)	3.996 (1.00)
PROPERTY	0.169 (1.22)	-	-	-	-	-
BUSINESS	-	0.471***(2.81)	-	-	-	-
FISCAL	-	-	-0.276* (-1.90)	-	-	-
GOUV	-	-	-	-0.255** (-2.45)	-	-
CORRUPTION	-	-	-	-	0.179 (1.18)	-
FINANCIAL	-	-	-	-	-	0.194 (1.15)
Constant	-10.749 (-1.54)	-34.916***(-3.00)	19.613 (1.43)	10.823 (1.36)	-9.538 (-1.48)	-15.476 (-1.47)
	R^2 = 0.775	R^2 = 0.818	R^2 = 0.792	R^2 = 0.807	R^2 = 0.774	R^2 = 0.774

***, **, * *significant at 1%, 5% and 10% level*

Source: Own calculations using STATA 9.1 software

Keeping with the results of the regressions, the significant institutional variables for the life insurances are: BUSINEES ($p<0.01$), FISCAL ($p<0.1$) and GOUV ($p<0.05$).

Business freedom is a quantitative measure of the ability to start, operate, and close a business and represents the efficiency of Government in the regulatory process. This

factor is significant and positive which means that efficient regulations regarding requirements for national ownership, entry of new firms, limits on foreign investment, and profit remittances determine a growth of the life insurance density.

Fiscal freedom is a measure of the tax burden imposed by Government and is proved to be negatively significant for the life insurance density. The density of the life insurance sector is higher if the Government relaxes the taxes for this line of business (e.g. the fact that life insurance indemnities are discharged from taxes represents an incentive to buy such products). .

Government spending represents level of Government expenditures as a percentage of GDP and is also found to be significant and negatively related to the life insurance density. In other words the governmental expenditures for public social security programs or trade indemnity insurance reduce the life insurance density. The retirement savings directed through the Government will diminish the demand for life insurance products too.

To sum up the assumptions formulated through the *H5* hypothesis are proved out, the different components of the institutional factors act dissimilar varying with the insurance line.

6. Conclusions and policy implications

The results have a number of important consequences. The force of the insurance sector can diminish the burden on public obligations by decreasing the demand for social security schemes, pension funds or indemnity insurances (e.g. malpractice insurance). For the insurance sector to prosper it is required a favorable legal context: the efficiency of Government in the regulatory process, measured through business freedom, positively influences the life insurance density; the relaxation of the taxes for the life line of business stimulates the consumption and a low level of corruption in a country will determine a growth in the non-life insurance density.

The implication of the State in the regulatory process matters greatly, especially in cases of "uninsurability" (Gollier, 2004). This phenomenon can arise in cases of serious adverse selection problems and can be solved by imposing for example the legal obligation of having both private and public (subsidized) health insurance. Another serious problem that can arise is moral hazard which can be prevented through efficient controlling of the behavior of the insured's by legal penalties and supervision imposed by public authorities. The collaboration between public authorities and the insurance companies may improve the health of the population, the accidents prevention or the agricultural risks compensation.

In a period of crisis in which the high burden of taxation has affected the population, the insurance industry can be encouraged by the State through deductibles for some line of businesses. This fiscal policy might have positive effects on the overall economic growth underlining the importance of insurance companies as an institutional investor.

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