# MEASURING FINANCIAL SOUNDNESS OF INSURANCE COMPANIES BY USING CARAMELS MODEL – CASE OF CROATIA

<sup>1</sup> Ph.D. Candidate, Polytechnic of Karlovac, Republic of Croatia, nikolina.smajla@vuka.hr

#### Abstract

Insurance companies are institutions that mobilize risk from individuals and companies through insurance contract making exposure to risk to the whole economy lower. Their financial soundness is a key to their success and stability of this part of financial sector and therefore regulators have developed different kinds of models to evaluate their work.

The main purpose of this research is to explain one of the recent models used for analyzing financial soundness of insurance companies, CARAMELS model, and to understand the level of soundness of Croatian insurance companies. Methodology used to control and regulate insurance sector in Croatia is different from presented model, so this work gives a different view of the sector's soundness.

Some conclusions regarding given categories of financial soundness of the sector will be made based on data from global database of insurance companies (ISIS database). At the end of the paper recommendations for further research are made.

# JEL Classification: G22

Keywords: insurance companies, financial indicators, CARAMELS model

# 1. Introduction

Insurance sector as a part of financial sector has grown in past decades in developed as well as in developing countries. The main business of insurance companies is risk mobilization of individuals and companies based on the system of pooling and diversification. It also strengthens the linkages with other sectors of the economy promoting growth and stability, and creating a sizeable impact on the national income of the country (Simpson and Damoah; 2008, 2). Individuals or companies can reduce their risk by forming a pooling arrangement which is not costless to operate – the cost of organizing and operating pooling arrangements is the main reason why insurance companies exist and why most pooling arrangements take place indirectly through insurance contracts (Harrington and Niehaus; 2004, 63). Insurance activity is characterized by the reversal of the production cycle because premiums are collected when the contract is signed and claims and costs arise only if specific event occurs (Simpson and Damoah; 2008, 3).

Therefore management of insurance company and the evaluation of their work is very complex. As insurance sector is currently facing many challenges such as increased competition, consolidation, solvency risks and a changing regulatory environment, maintaining the sound financial health of insurance industry is most challenging job for regulatory agencies while its contribution to the economy and society is noteworthy (Ghimire; 2013, 1).

#### 2. Evaluation of insurance companies' financial soundness

By doing their core business, insurance companies are exposed to different types of risk, starting from underwriting risks that are accepted from insurers, through investment risks to the non-technical risks such as management risk, business risk and legal risk. The main task of evaluating financial soundness of insurance sector is therefore to explore risks to which insurers are exposed and to find a way to manage them.

Because of high growth rate of the sector, supervisors and regulators have developed different models to evaluate and control business activities of insurance companies and to achieve contribution of insurance sector to economic growth. In many jurisdictions, the regulators evaluate insurers from their financial reports usually used in accountancy: balance sheet, profit and loss account and additional notes, and different (annual, quarterly, monthly) statements concerning solvency margin, premium income, losses, reservs etc. Some of the indicators used for evaluating financial health of insurers are Financial soundness indicators developed by World Bank and International Monetary Fund.

# 2.1. Financial soundness indicators

Financial soundness indicators (FSI) are indicators of financial stability of the financial institution (World Bank, IMF, 2005). They can be measured for individual institution as well as for the whole market in which the institution operates. Main goal of calculation of FSI's is to support macroprudential analysis, to assess and ensure surveillance of the strengths and vulnerabilities of financial system, to enhance financial stability and to limit the likelihood of a failure of the financial system.

International Monetary Fund has provided the guidance on the concepts and definitions, and sources and techniques for the compilation and dissemination of the FSI's (*Compilation Guide on Financial Soundness Indicators, IMF 2004*). It contains a discussion of the distinction between a "core set" for which data are generally available and are found to be highly relevant for analytical purposes in almost all countries and "encouraged set" for which data are not as easily available and whose relevance could vary across countries (World Bank, IMF, 2005).

FSI's are a comprehensive set of indicators used in economics statistics that reflect a mixture of influences. Some of the concepts are drawn from prudential and commercial measurement framework, which have been developed to monitor individual entities. Other concepts are drawn from macroeconomic measurement frameworks, which have been developed to monitor aggregate activity in the economy.

#### 2.2. Financial soundness indicators for insurance companies – CARAMELS model

FSI's used for banking sector are known as CAMELS framework (Capital adequacy, Asset quality, Management soundness, Earnings and profitability, Liquidity and Sensitivity to market risk) are routinely used and have shown good results in financial soundness measurement.

In insurance companies performance, quantitative soundness indicators are presented in CARAMELS framework (Capital adequacy, Asset quality, Reinsurance, Adequacy of claims and actuarial, Management soundness, Earnings and profitability, Liquidity and Sensitivity to market risk), which adds the reinsurance and actuarial part to the CAMELS framework. It is important to note that some indicators used for banks are different in construction when used for insurance companies and require different interpretation.

Das, Davies and Podpiera (2003) have proposed a set of indicators for the insurance sector (grouped separately for life and non-life insurance) that should be compiled and used for surveillance of financial soundness of insurance companies and the insurance sector as a whole. Previous works have been concentrating on the banking system, and quoted work is the first scientific approach to indicators of financial stability of insurance market. The set of indicators are presented in table 1. Although the overall financial soundness of the financial institution depends on many factors such as quality of management or organizational structure, these indicators are verified to achieve an acceptable degree of reliability (Das, Davies and Podpiera; 2003, 21). Many of them are common for life and non-life insurance companies, but it is important to realize that for deeper analysis, different lines of business needs to be analyzed separately.

Category	Indicator	Non-life	Life
Capital adequacy	Net premium/capital	х	
	Capital/total assets	х	
	Capital/technical reserves		х
Asset quality	(Real estate+unquoted equities+debtors)/total assets	х	Х
	Receivables/(Gross premium+reinsurance recoveries)	х	х
	Equities/total assets	х	х
	Nonperforming loans to total gross loans		х
Reinsurance and actuarial issues	Risk retention ratio (net premium/gross premium)	х	х
	Net technical reserves/average of net claims paid in last 3 years (survival	х	
	ratio)		х
	Net technical reserves/average of net premium received in last 3 years		
Management soundness	Gross premium/number of employees	х	х
	Asset per employee (total assets/number of employees)	х	х
Earnings and profitability	Loss ratio (net claims/net premium)	х	
	Expense ratio (expense/net premium)	х	х
	Combined ratio = loss ratio + expense ratio	х	
	Revisions to technical reserves/technical reserves		х
	Investment income/net premium	х	
	Investment income/investment assets		х
	Return on equity (ROE)	х	х
Liquidity	Liquid assets/current liabilities	Х	Х
Sensitivity to	Net open foreign exchange position/capital	Х	Х
market risk	Duration of assets and liabilities		Х

Table 1: Insurance Financial Soundness Indicators: Core Set

Source: Das, U., Davies, N., Podpiera, R. (2003): Insurance and Issues in Financial Soundness, IMF Working Paper No. 3/138, p. 28

Comparing to other frameworks used for financial evaluation of insurers (Simpson and Damoah; 2008, 12), CARAMELS model has developed two significantly important parts of analysis: the issue of management soundness and actuarial issue. According to Das, Davies and Podpiera (2003), sound management is vital in the assessment of the financial strength of an entity, it is crucial for financial stability of insurers, though it is very difficult, to find any direct quantitative measure of management soundness. The core set of Insurance Financial Soundness Indicators use the "survival ratio" (net technical reserves to average of net claims paid in last 3 years) for non-life insurance, which shows the quality of company's estimate of the value of the reported and outstanding claim.

#### 3. Insurance sector of the Republic of Croatia

In the Republic of Croatia insurance sector is regulated by Croatian Financial Services Supervisory Agency (CFSSA). It has grown rapidly from 2003 till 2008 when it started perceiving the influence of economic crisis in the country. Gross written premium has grown from 2003 till 2008 at the rate of more than 10% and then started declining at the rate of 2,8% (in year 2009 in comparison to 2008), 1,7% in 2010 in comparison to 2009, 1% in 2011 in comparison to 2010 and 1,1% in 2012 in comparison to 2011.

The Croatian insurance sector in 2011 consisted of 27 insurance companies and 1 reinsurance company. Six of them conducted life assurance business only, ten insurance companies carried on non-life insurance only and ten companies carried on both life and non-life business (composite companies). One company, Wüstenrot životno osiguranje d.d. obtained operating licence from the Agency but did not start performing insurance activities in the same year (Croatian Financial Services Supervisory Agency, 2011). Situation in 2012 was similar, there were 27 licenced insurance companies and one reinsurance company in the insurance market. Seven of them pursued only life activities, ten companies carried on non-life insurance only and ten companies were composite companies.

#### 4. Using CARAMELS model in Croatian insurance companies

Financial evaluation of insurers in the Republic of Croatia hereafter will be made using CARAMELS methodology. Although some of the indicators are very similarly used by Croatian Financial Services Supervisory Agency, the whole methodology is not used in Croatia. Data for the analysis is taken from the ISIS database which contains comprehensive information on insurance companies across the globe; private and public insurance companies. It is owned by Bureau van Dijk and contains detailed financial statements of the companies as well as some information like ownership, geographical coverage, types of business and stock data for listed companies. Information for analysis is taken from the ISIS database because of future possible cross-country comparability using the same set of information.

The last available information from the Database are data for the year 2011, which are analyzed hereafter. In the ISIS database, there are total of 24 companies in Croatia with data for 2011: one of them is reinsurance company, 10 composite companies, 8 non-life and 5 life insurance companies. The analysis will be made for 23 companies which is 85% of total number of insurance companies in Croatia in 2011 and 95,95% of gross written premium of all insurance companies (Croatian Financial Services Supervisory Agency, 2011).

Composite companies for which the data is available are: Croatia Osiguranje, Allianz Zagreb, Kvarner Vienna Insurance Group, Grawe Hrvatska, Basler Osiguranje Zagreb, Triglav Osiguranje, Helios Vienna Insurance Group, Generali Osiguranje and Uniqa Osiguranje. Non-life companies are: Euroherz Osiguranje, Jadransko Osiguranje, Sunce Osiguranje, HOK Osiguranje, BNP Paribas Cardiff Osiguranje, Velebit Osiguranje, Hrvatsko kreditno osiguranje and ERGO Osiguranje. Life companies taken into analysis are: Agram Životno Osiguranje, Erste Osiguranje VIG, ERGO Životno osiguranje, Societe Generale Osiguranje and KD Životno Osiguranje.

FSI's have been calculated according to Das, Davies and Podpiera's methodology taking into account differences between life and non-life companies and are presented in table 2. If a indicator has to be calculated only for, for example, nonlife companies, composite companies have been also taken into account because they are carrying on both life and non life businesses. Some of the indicators (for example from category of Sensitivity to market risk) could not be calculated due to the absence of information.

Category	Indicator	Non-life	Life	Composite	Total
Capital adequacy	Net premium/capital	5,70	-	4,30	-
	Capital/total assets	0,06	-	0,06	-
	Capital/technical reserves	-	0,12	0,07	-
Asset quality	(Real estate+unquoted equities+debtors)/	0,20	n.a.	0,22	0,20
	total assets				
	Receivables/(Gross premium+reinsurance	0,22	0,00	0,21	0,20
	Equities/total assets	0,00	0,00	0,01	0,01
	Nonperforming loans to total gross loans	-	n.a.	n.a.	-
Reinsurance and actuarial issues	Risk retention ratio	0,96	1,00	0,84	0,88
	Net technical reserves/average of net claims	2,94	-	5,33	-
	paid in last 3 years (survival ratio)				
	Net technical reserves/average of net	-	3,97	3,11	-
	premium received in last 3 years				
Management	Gross premium/number of employees	664,77	170,39	930,34	906,39
soundness	Asset per employee	1.482,72	487,47	3.166,88	3.039,31
Earnings and profitability	Loss ratio	0,39	-	0,59	-
	Expense ratio	0,75	0,98	1,11	1,01
	Combined ratio	1,15	-	1,70	-
	Revisions to technical reserves/technical reserves	-	n.a.	n.a.	-
	Investment income/net premium	0.04	_	0.19	_
	Investment income/investment assets	-	0,04	0,06	_
	Return on equity (ROE)	0,79	0,28	0,05	0,22
Liquidity	Liquid assets/current liabilities	133,16	, 117,76	60,82	98,36
Sensitivity to	Net open foreign exchange position/capital	n.a.	n.a.	n.a.	n.a.
market risk	Duration of assets and liabilities	-	n.a.	n.a.	_

# **Table 2:** Insurance Financial Soundness Indicators for Croatia, 2011.

Source: ISIS database

Listed hereafter, indicators are explained for each category separately.

1. Capital promotes the stability and efficiency of financial system and indicates whether the insurance company has enough capital to absorb losses arising from claims. Higher capital adequacy ratio means capital is sufficient to the smooth run of the business (Ghimire; 2013, 3).

First indicator in category of capital adequacy (net premium/capital) is calculating only for non-life companies and amounts 5,70 (4,30 for composite companies). The highest indicator is measured for Euroherz osiguranje (31,38), therefore this company has used its capital to collect the biggest amount of premium. Second indicator is showing the ratio of capital to total assets. For non-life and composite companies it amounts 0,06 and the highest indicator is calculated for Hrvatsko kreditno osiguranje (0,96). Third indicator (ratio of capital to technical reserves) is calculated for life and composite companies: for life companies it is 0,12 and for composite companies 0,07. KD Životno osiguranje has the biggest indicator of all life insurance companies (5,48), and Kvarner Vienna Insurance Group of all composite indicators (0,19).

- 2. Indicators in category of asset quality do not show some mayor differences in life and non-life companies. Ratio of the sum of real estate value, unquoted equities and debtors in relation to total assets is 0,20 for non-life companies as well as for all companies in Croatia. Ratio of receivables in relation to sum of gross premium written and reinsurance recoveries is 0,20 for all companies in Croatia, 0,22 for non-life and 0,21 for composite companies.
- 3. Interesting indicators for insurance companies are those in the category of reinsurance and actuarial issues. Risk retention ratio (net premium/gross premium) is a measure of how much of the risk is being carried by an insurer rather than being passed to reinsurers. Non life companies have ceded 4% of risk to reinsurers (risk retention ratio equals 0,96), composite companies 16% (risk retention ratio equals 0,86) and life insurance companies have ceded almost nothing (their risk retention ratio is 1,00). In the whole insurance sector of Croatia 12% of collected premiums have been passed to reinsurers.
- 4. As it was noted before, management soundness issue is significantly important part of analysis in CARAMELS model. First indicator, Gross written premium in comparison to number of employees shows how much premium is collected per one employee in the company. It is a good indicator of management soundness because it is important to have appropriate number of employees who are able to collect big amount of premiums, in other words management efficiency and soundness is outcome of operational efficiency of the company (Ghimire; 2013, 3). For non life companies the

indicator is 664 thousands kuna, for life companies is lower (170,39 t kn) and for composite is the biggest (930,34 t kn). The best indicator is of Croatia Osiguranje, composite company and the biggest company in the whole sector (measured by the amount of collected premiums).

Asset per employee is another indicator of management soundness issue connected to the amount of asset per one employee. The biggest ratio is once again at the composite companies (3.166,88 t kn), but this time Croatia Osiguranje is not leading, but Merkur Osiguranje (8.843,09 t kn).

- 5. By category of earnings and profitability there is a set of seven indicators that show how profitable insurance companies are. Composite companies show the best results in every indicator because they have the biggest amounts of premium collected as well as the best results in investment business. But, return on equity is the greatest for non-life companies (0,79) and the lowest for composite companies (0,05).
- 6. Indicator of liquidity (liquid assets/current liabilities) is not showing good results, especially for composite companies (60,82). Life and non-life companies have better liquidity (life: 117,76, non-life: 133,16) which means that they don't have problems with the amount of liquid asset for paying their current liabilities. Composite companies have some problems with the issue, mainly due to the situation of illiquidity of the whole economy.

# 5. Conclusion

Based on the secondary information from the ISIS database, some conclusions of financial sector' soundness in Croatia can be made. Regarding capital adequacy ratios, Euroherz osiguranje has achieved the best results, which can show how stable their business is. Composite companies have shown that they use reinsurance service more than other companies because their risk retention ratio is the lowest. Composite companies also have the healthiest management, above all the biggest insurance company, Croatia osiguranje. Composite companies have also the greatest profitability indicators, but the lowest return on equity. Above all, the worst indicators are indicators of liquidity that can represent serious problems for insurance companies.

Insurance regulatory authority of Croatia, Croatian Financial Services Supervisory Agency should pay proper attention to capital adequacy and liquidity indicators of insurance companies, as well as their management soundness because these categories pay major role in total financial soundness of the sector. Insurers also must be aware of their financial health to ensure stable and sound business.

Some of the major limitations of the study are concentration to one country and data for one year. Therefore, recommendations for further research is to make analysis for more years in Croatia, to make deeper analysis separately for life and non-life companies and to make cross-country comparability using the same set of information.

# **References:**

- 1. Das, U., Davies, N., Podpiera, R. (2003): Insurance and Issues in Financial Soundness, IMF Working Paper No. 3/138
- 2. Ghimire, R. (2013): Financial Efficiency of Non Life Insurance Industries in Nepal, The Lumbini Journal of Business and Economics, Vol-III, No.-2, ISSN 2091-1467
- 3. Harrington, S. E., Niehaus, G. R. (2004): Risk Management and Insurance, Mc-Graw Hill, New York
- 4. http://www.hanfa.hr/en/nav/258/insurance-market.html Pristup: (12-03-2014)
- 5. http://www.hanfa.hr/getfile/39347/HANFA\_Annual%20Report%202011\_ WEB%20Publication.pdf Pristup: (08-03-2014)
- 6. http://www.hanfa.hr/getfile/40363/GI\_2012\_eng.pdf Pristup: (08-03-2014)
- 7. IMF (2004): Compilation Guide on Financial Soundness Indicators
- 8. Simpson, S. N. Y, Damoah, O. B. O. (2008): An Evaluation of Financial Health of Non-Life Insurance Companies from Developing Countries: The Case of Ghana, 21st Australasian Finance and Banking Conference, December 16-18, 2008, Sydney
- 9. World Bank; International Monetary Fund (2005): Financial Sector Assessment: A Handbook, Washington, DC