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PROFITABILITY DETERMINANTS OF NON-LIFE INSURANCE COMPANIES IN SERBIA

Determinante profitabilnosti neživotnih osiguravajućih kompanija u Srbiji

Abstract

Taking into account the specifics of the Serbian insurance market, the insurance sector in Serbia is still underdeveloped and, if we take the degree of development into account, it is well below the average for European Union member states. The insurance market in Serbia is developing and has great potential opportunities. Profitability is one of the most important goals of financial management. The aim of this research is to examine the impact of internal factors of non-life insurance business operations such as: asset size (company), asset growth, premium growth, liquidity ratio, debt ratio, underwriting risk, operating costs, financial leverage, and total revenues of the profitability of non-life insurance companies in Serbia. The results of the research were obtained using the multi-linear regression model, where the representativeness of the model was tested by calculating the coefficient of correlation, the determination coefficient and the corrected determination coefficient. Also, a variance analysis (ANOVA) was carried out, in order to test the significance of the observed variables in the model and examine the impact of these independent variables on ROA profitability as a dependent variable. The fundamental results are placed on giving an empirical basis for reaching the conclusion that the greatest impact on the profitability of non-life insurance companies is exerted by the increase in premiums, the debt ratio, operating costs and the share of profit in total revenues.

Keywords: *non-life insurance companies, determinants of profitability, insurance, regression.*

Sažetak

Uzimajući u obzir specifičnosti srpskog tržišta osiguranja, sektor osiguranja u Srbiji je i dalje nerazvijen i po stepenu razvijenosti nalazi se znatno ispod proseka zemalja članica Evropske unije. Tržište osiguranja u Srbiji je u razvoju i ima ogromne potencijalne mogućnosti. Profitabilnost je jedan od najvažnijih ciljeva finansijskog upravljanja. Cilj ovog istraživanja je ispitivanje uticaja unutrašnjih faktora poslovanja neživotnih osiguravajućih kompanija kao što su: veličina aktive (kompanije), rast aktive, rast premije, racio likvidnosti, racio zaduženosti, poslovni rizik (underwriting risk), operativni troškovi, finansijski leveridž, učešće dobiti u ukupnim prihodima na profitabilnost neživotnih osiguravajućih kompanija u Srbiji. Rezultati istraživanja su dobijeni primenom modela višestruke linearne regresije gde će se reprezentativnost modela ispitati proračunom koeficijenta korelacije, koeficijenta determinacije i korigovanog koeficijenta determinacije. Takođe, biće sprovedena i analiza varijanse (ANOVA), kako bi se testirala značajnost posmatranih varijabli u modelu i sagledao uticaj navedenih nezavisnih varijabli na profitabilnost ROA kao zavisne varijable. Temeljni rezultati sastoje se u davanju empirijske podloge za donošenje zaključka da najveći uticaj na profitabilnost neživotnih osiguravajućih kompanija imaju rast premije, racio zaduženosti, operativni troškovi i učešće dobiti u ukupnim prihodima.

Ključne reči: *neživotne osiguravajuće kompanije, determinante profitabilnosti, osiguranje, regresija.*

Introduction

The insurance sector plays an important role in the industry of financial services, as it contributes to economic growth, enables efficient allocation of resources, affects the reduction of transaction costs, contributes to the creation of liquidity, and increases the economies of scale in investments. The insurance sector is a relatively stable segment of the financial system, where the interaction between insurance companies and other financial market participants, such as banks, pension funds and other financial intermediaries, is growing considerably over time [13, pp. 405-431].

The global economic crisis did not jeopardize the survival of insurance companies in the global financial market, because these institutional investors have invested available funds in a conservative, i.e., secure way. The deep recession, as the main characteristic of the macroeconomic environment of Serbia in which insurance companies operate, is the result of both the domestic socio-economic crisis, as well as the global financial crisis. The insurance industry in Serbia faces great challenges in gaining as many insurance clients as possible, retaining existing insurance clients, providing innovative insurance services, and making their distribution more efficient. In addition to the challenges presented by insurance companies, it is also certainly a challenge to improve performance in order to achieve greater profitability of insurance companies.

The business areas of insurance companies in Serbia, whose importance is expressed in terms of further creating of conditions for development of insurance are: corporate governance, adequate internal control system, improvement of investment and asset valuation techniques, transparency and activities for the development of insurance culture. These areas should be subject to continuous improvement by insurance companies in the coming period. In particular, the importance of strict compliance with the regulations in the field of compulsory (non-life) insurance by insurance companies is emphasized, especially with regard to the promptness of paying claims costs, the costs of conducting the insurance and the application of the bonus-malus system.

Financial performance is crucial for the survival and further growth and development of insurance companies. In addition, the financial performance of insurance companies has direct implications for a wide range of audiences, from insurers to stockholders, from employees to brokers, from regulatory authorities to potential investors [18, pp. 55-160]. Key indicators of a company's performance are profitability, size and continuity of the company's operations. Factors that affect the profitability of insurance companies can be classified as internal factors, insurance industry factors and macroeconomic factors.

Profit is a very important prerequisite for increasing the competitiveness of a company operating on the global market. In addition, profit attracts investors and improves the level of solvency, and in this way, increases the consumers' confidence. Financial analysis of companies is an important tool used by officials in the decision-making process on taking over the risks and investment activities of the insurance company. The financial performance of insurance companies is also relevant in the macroeconomic context, because the insurance industry is one of the parts of the financial system, which contributes to fostering economic growth and stability [3, pp. 299-308].

Most financial literature dealing with the profitability of insurance companies analyzes profitability from the aspect of the impact of internal factors. The variation between the profits of insurance companies over the years in a country depends on both domestic and specific internal factors that play a key role in determining profitability. For this reason, it is very important to define what are the internal factors and the nature of their impact, so that insurance companies can take all the necessary measures to increase profitability. Also, identifying factors that contribute to the profitability of insurance companies is very important for investors, researchers, financial analysts and supervisors. In order to obtain a more precise analysis of the profitability of insurance companies, it is important to take into account the total profit or loss arising from business over several years.

Upon realizing the significance of the financial institutions in the country's economy, and especially the importance of insurance companies in financing and securing economic activity, the survey will answer the

following questions: What factors influence the profitability of insurance companies; What is the correlation between profitability factors; Which factors do not affect profitability of insurance companies and why?

Literature review

In international literature, numerous studies have dealt with the profitability of not only insurance companies, but also other financial institutions, primarily banks. Studies on the profitability of insurance companies are usually divided into two categories. The first study focuses on the profitability of life insurance companies, while another study focuses on the profitability of non-life insurance companies. In both studies, internal factors were most commonly used to examine their impact on the profitability of insurance companies. The different results of the studies conducted in a large number of countries are contradictory, which is explained by the consequences of macroeconomic changes – which represent external factors that are specific for each country.

The authors analyzed the profitability determinants of Croatian composite insurance companies in the period from 2004 to 2009. For the analysis of profitability, specific internal factors were used for insurance companies in the Croatian market as well as external factors, which characterized the given economic environment. By applying the panel data technique, the authors proved that company size, underwriting risk, inflation and return on equity have a significant impact on the profitability of insurance companies in the Croatian insurance market. The final results show that the Croatian insurance market has a low level of development, but it is very dynamic [9, pp. 136-142].

Using CARMEL indicators and multiple regression in the 2006-2013 period, the authors analyzed the performance of non-life insurance companies in the insurance market in Serbia. The panel data model indicates a significant negative influence of the financial leverage, retention rate on the profitability of non-life insurers and combined ratio measured by ROA, while the influence of the written premium growth rate, return on investment and company size is significant and positive [17, pp. 367-381].

In the United Kingdom, the profitability determinants of insurance companies were analyzed in the period from 1986 to 1999, using three key indicators: investment yield, percentage change in shareholders' funds and return on shareholders' funds. Based on a panel data set, the author tested twelve changeable variables empirically and demonstrated that the performance of insurers has a positive correlation with interest rate, return on equity, solvency margins and liquidity, as well as a negative correlation with inflation and reinsurance dependence [32, pp. 1079-1110].

In the period from 2002 to 2009 [16, pp. 02-787], three profitability determinants were analyzed (technical profitability, profitability of investment activity and sales profitability) for twenty-five insurance companies dealing with non-life insurance. The author proved that the volume of gross premiums is especially significant and positively affects the profitability of insurance companies. Reducing operating costs has a positive impact on the increase in technical profitability of insurance companies. Also, the participation of motor vehicle insurance in the portfolio of insurance companies has a negative impact on their profitability.

Examined results of 198 insurers in nine EU countries for the years 2004 through 2012 [22, pp. 159-177] determined that ROA is affected by variables related to operation of companies. It is negatively influenced by asset size, combined ratio and variable referred to as internationalization (when shareholders are foreign companies or groups) and diversification (mixed companies operating both in non-life and in life insurance), while a positive impact was found for variables defined as reserves' dimension and asset turnover. Similar variables significantly influenced the size of ROE.

The author evaluated the performance of five life insurance companies in the time period from 2002 to 2003 in terms of various plans and policies on the basis of annual growth rate. The study concluded that life insurance companies in the public sector were lagging behind due to competition faced by private insurers, whereas private life insurance companies performed well in terms of financial aspects [25, pp. 233-258].

At the moment, the insurance industry in India is in a state of change of regulations by the Insurance Regulatory Development Authority (IRDA), aiming to regulate and develop the insurance industry. Analyzing a large number of determinants, it has been concluded that the insurance industry has been extensively expanded since 2000 in terms of number of offices, number of agents, new business policies, insurance products, premium payments, etc. [5, pp. 146-150].

There are many factors that can be related to the financial performance of insurance business operations. This includes the growth of the company, which is expected to be in a negative correlation – the higher the growth rate, the lower the financial impact. The expected relationship between size and financial insurance business is positive due to economies of scale. The relationship between the retention ratios of financial operations is not definitive and requires empirical determination. This is because two insurers can have very different ratios and yet record similar financial performance, depending on the classes of insurance that they transact. The more allocation of available resources to productive investments, the higher the expected financial performance. Similarly, the higher the return emanating from the investments, the better the financial performance. Claims erode earnings, and hence the lower the loss ratio, the higher the financial performance. Also the higher the relative costs, and hence the cost ratio, the worse the financial performance [6, pp. 207-224].

The financial performance of insurance companies business will depend on how, to what extent and where available funds are invested, and how much the return rate on invested funds is [7, pp. 469-499]. Losses or total claims costs in relation to the premium indicate the results of the insurance or essentially the quality of the undertaken activities. Cost ratio, as a ratio of total costs (without claims) and premiums, basically points to operational efficiency in the management of insurance companies. Higher cost coefficient means that the financial impact is lower [20, pp. 1510-1524].

The author analyzed the impact of the factors on the profitability of insurance companies in the period from 2005 to 2010 in the insurance market of Bosnia and Herzegovina, which experienced enormous changes at that time. The analysis was carried out using a dynamic panel model where the obtained results indicate the significant and negative impact of loss on the profitability of insurance companies and the significant and positive impact of the number of years in business, market share, and earlier performance in relation to the existing situation. The results show that diversification did not have a positive impact on the profitability of insurance companies, and that foreign-owned companies were more successful business-wise [29, pp. 158-163].

The results obtained by applying specific panel techniques in the insurance market in Romania in the period from 2008 to 2012 show that the key determinants influencing the financial performance of insurance companies in Romania are the financial leverage in insurance, company size, growth in gross written premiums, underwriting risk, risk retention ratio and solvency margin. The insurance financial leverage reflects the potential impact of technical reserves on capital deficits in the event of unexpected losses and has a negative impact on the financial performance of insurance companies. The size of insurance companies positively influences financial performance as larger companies have more funds, which enables them to diversify risks better and manage the costs of the company more effectively. Gross premium growth has a negative impact on the financial performance of the company because, in some cases, excessive growth of underwritings generates higher risk and creates the need to increase technical resources. The underwriting risk has a negative impact on the financial operations of insurance companies since an over-estimation of underwriting risk can destabilize the company through an increase in costs. The retained risk ratio has a positive impact on the financial performance of companies, as reinsurance involves a certain cost. The solvency margin has a positive impact on the financial performance of insurance companies, because their financial stability is important for potential clients [3, pp. 299-308].

For the period from 2007 to 2012 the authors used multiple linear regression models to analyze which factors affect the profitability of insurance companies in India. The results show that the values of variables such as current

liquidity, size of the company and equity are statistically significant, at the level of 10%, which means that there is a significant relationship of profitability with current liquidity, company size and equity. There is a significantly positive relationship between the profitability of insurance companies and current liquidity. Also, there is a positive relationship between the profitability and the size of the insurance companies, but there is a significantly negative relationship between profitability and capital. The results indicate that solvency ratio and insurance leverage are not statistically significant and do not affect the profitability of insurance companies [31, pp. 44-52].

The results of the study conducted in Kenya in the period from 2010 to 2012 [24, pp. 210-215] show that the higher the ratio of earning assets to total assets, the better the financial performance of general insurance companies in Kenya. Also, a higher return on investment contributes to the better financial performance of insurance companies. The higher the loss and expense ratios, the worse the financial performance. The growth rate, size and retention ratio would not help determine the financial performance of general insurance companies in Kenya.

In Pakistan, in the period from 2005 to 2009, the authors determinants of the profitability of insurance companies on a sample of 34 insurance companies, using a multiple linear regression [21, pp. 315-321]. The variables tested in this paper are the age, size and volume of capital, leverage and loss ratio. The result shows that there is no link between profitability and age of insurance companies. There is a significantly positive relationship between the profitability and the size of insurance companies. The result of the survey also shows that the volume of capital significantly and positively affects the profitability of insurance companies in Pakistan.

Also, in the period from 2005 to 2013, the authors analyzed the financial performance of 24 insurance companies that deal with non-life insurance, using panel regression [30, pp. 354-361]. The results show that age and loss ratio proved to be significant in determining the financial performance, while the growth of premium, size of firm, debt and expense ratio proved insignificant.

In Poland, in the period from 2006 to 2013, the authors analyzed the determinants of the profitability

of insurance companies and proved that the variables measured in terms of natural log of gross written premiums, natural log of total assets or natural log of total investments have a positive relationship with profitability ratio of technical activity, ROA, ROE, but at the same time negative relationship with the natural log of total assets, sales profitability ratio, profitability of subscribed capital and negative impact on the profitability of gross written premiums [27, pp. 53-66].

The analysis of the financial performance of non-life insurance companies in Turkey in the period from 2010 to 2014 [14, pp. 277-288] takes into account capital adequacy, liquidity ratio, operating ratios and profitability ratios. The non-life insurance companies that were the subject of the analysis were ranked according to the results of the gray relational analysis (GRA) method. The results of the analysis showed that profitability ratios have the greatest impact on the financial performance of non-life insurance companies. Also, the results show that the loss ratio and technical profitability ratio have come to the forefront among profitability ratios. Based on the obtained results, non-life insurance companies can ensure sustainable profitable growth and competitiveness in the market by applying adequate risk-taking strategies, rational pricing policies, efficient control and optimization of operating costs. Insurance companies are expected to improve their financial results in terms of ensuring capital adequacy for exposure to all risks in business, setting up an investment policy that will ensure optimum liquidity and profitability of insurance companies, reducing loss of funds by more efficient risk taking and determining the price of the assumed risk and company growth strategy based on a sustainable level of profitability.

The main results of the study which analyzed key factors that affect the profitability of non-life insurance companies in the period from 2006 to 2013, by using data from publicly available corporate reports of various companies, show that the profitability of non-life insurance is statistically significant and in a positive correlation with the size of the company's growth rate and premium, while profitability is statistically significant and in a negative correlation with the company's age, loss ratio and current ratio. The results of the study have several implications for

Turkish non-life insurance. They show that larger non-life insurance companies have higher profitability compared to smaller insurance companies. Low underwriting risk companies have higher profitability than companies with higher underwriting risk. The obtained results for current ratio indicate that insurance companies for non-life insurance with lower liquidity have higher profitability than companies with higher liquidity [15, pp. 510-529].

The authors analyzed a sample of 2,176 property insurance companies that operated in 91 countries in the period from 2005 to 2009. They observed specific factors which affect the profitability of insurance companies. The results show that higher GDP growth, lower inflation rates, lower inequalities, and developed stock exchange operations positively affect the performance of non-life insurance companies [10, pp. 155-170].

In Ethiopia, in the period from 2005 to 2009 [23, pp. 245-255], the authors analyzed the impact of specific factors on profitability of insurance companies such as: company size, leverage, tangibility of assets, loss ratio, growth in writing premium, liquidity, and age of the company. According to the results of the survey, a significantly positive influence on the profitability of insurance companies includes the factors such as: the size of the company, tangibility of assets and leverage, while the loss ratio has a significantly negative impact on the profitability of insurance companies. The results also show that the age of the company, growth in premium writing and liquidity did not significantly affect the profitability of insurance companies.

Also, in Ethiopia [12, pp. 45-53], the authors analyzed the performance of insurance companies in the period from 2004 to 2013 using the panel regression model. The results prove that firm leverage, size, tangibility and business risk have a positive impact on the financial performance of insurance companies. The result proves that the increase in leverage negatively affects the performance of Ethiopian insurance industry.

Using data from all insurance companies listed in the Amman Stock Exchange in the period from 2002 to 2007 [1, pp. 266-289], the authors investigated factors that affect the financial performance of the Jordanian insurance companies. The results of regression analysis prove that leverage, size of the company, and management competence index have a significant and positive effect on the financial performance of Jordanian insurance companies. The results also show that there is no significant link between the age of the company and ROA.

There is a great number of relevant studies related to the determinants of the overall financial performance of insurance companies in the developed countries, while relatively few studies focus on the determinants of the financial operations of insurance companies in developing countries [2, pp. 133-143].

It is believed that there is a significantly negative relationship between the financial operations of insurance companies with leverage and equity capital. Size and liquidity have a significantly positive influence on the financial operations of insurance companies, whereas underwriting risks do not have a significant impact on the financial operations of insurance companies [8, (2012)].

The study [26, pp. 7-12] proved that the size of the company significantly and positively affected the financial performance of insurance companies, while the tangibility of assets and liquidity had a positive impact on financial operations but were not significant statistically.

A large number of surveys conducted in a number of European countries on the impact of certain factors on the profitability of insurance companies indicate that the greatest impact on the profitability of insurance companies is exerted by size, diversification, leverage and reinsurance activity [11, pp. 444-466].

Size has many potential benefits for insurers, including diversification. Basically, larger firms have a lower risk of insolvency, because the cost of receivables tend to be less variable, they have higher market power and therefore can charge higher prices and have higher revenue efficiency. Accordingly, the size should be positively related to financial performance. This indicates a positive relationship between the size and performance of insurance companies [4, pp. 15-53].

A survey conducted in Ghana [19, pp. 19-37] analyzed the impact of a number of factors on the profitability of non-life insurance companies in the period from 2009 to 2013. The results of the survey show that the firm growth, gross written premium and size significantly influence the

profitability of insurance companies statistically-wise. The results also show that liquidity and leverage have a positive impact, while the claim has a negative impact on the profitability of insurance companies.

A study conducted in Bangladesh [33, pp. 138-147] in the period from 2004 to 2014 using the panel regression analyzed the impact of selected variables on the profitability of insurance companies. By analyzing the impact of independent variables – underwriting risk, expense ratio, solvency margin, premium growth, asset growth and company size, using an Ordinary Least Squares (OLS) regression model, it was shown that there was an inverse relationship between underwriting risk, size, and profitability. The results also show that all independent variables, except for premium growth, have a significant impact on the profitability of insurance companies. The underwriting risk and size have a negative relationship with ROA. More specifically speaking, underwriting risk has a moderately significant impact, while size has a weak impact. Solvency margin and growth have a positive relationship with ROA.

The authors [28, pp. 231-238] analyzed the impact of independent variables on the profitability of non-life insurance in the Republic of Croatia in the period from 2003 to 2009. The results of the study prove that ownership, expense ratio and inflation have a negative and significant influence on profitability. Also, average profitability has a positive and significant impact on the profitability of Croatian non-life insurance companies.

Methodology and model specification

The research applied the model of multiple linear regression without panel analysis for non-life insurance companies in the 2010-2015 period with the number of observations at 95, due to the fact that the number of insurance companies changed in the observed period. In some years, the operations of individual insurance companies have also been scattered by liquidation, the purchase of individual insurance companies by other insurance companies, and the simultaneous entry of other foreign insurance companies, which limited access to data for the application of panel analysis.

In this study, a multi-linear regression model was used to evaluate the nature and strength of the bond between a dependent variable, and independent variables that are denoted by K. The regression analysis examines the relationship between the profitability of non-life insurance companies as a dependent variable and K independent variables. Regression is basically a statistical technique that predicts the value of a dependent variable based on one or more independent variables. A multi-linear regression model has been developed to measure the profitability of non-life insurance companies:

$$ROA = \alpha + \beta 1 X 1 + \beta 2 X 2 + \beta 3 X 3 + \beta 4 X 4 + \beta 5 X 5 + \beta 6 X 6 + \beta 7 X 7 + \beta 8 X 8 + \beta 9 X 9 + X 10 + \varepsilon$$

Representativeness of the model is examined by calculating the coefficient of correlation (r), the coefficient of determination and the corrected determination coefficient $\bar{R}^2$. If the stated coefficient is greater than 50%, the model

Table 1: Dependent and independent variables

Notation	Variable	Measurement method
X1	Return on assets (ROA)	Profit after tax/total assets
X2	Asset growth (A)	Log of total assets
X3	Company growth	Assets growth
X4	Premium growth	(Premium t – premium t-1)/ premium t-1
X5	Liquidity ratio	Current assets/Current liabilities
X6	Debt ratio	Total equity/Total assets
X7	Operating costs	Salary costs/Written premium
X8	Underwriting risk	Gross (net) premiums/Equity
X9	Financial leverage	Total debt/Equity
X10	Profit growth	Net result/ Total revenue
A	Constant	-
E	Error	-

Source: Authors' calculation.

is representative. Also, a variance analysis (ANOVA) is conducted, where the significance of the observed variables in the model is tested. The significance of the model is present if Sig. <0.05. The correlation coefficient can have values in the range of -1 to +1.

The correlation coefficient shows the strength of the relationship between the two observed variables. When the value of the coefficient is zero, then there is no correlation between the variables. The coefficient value of 1.0 shows that the correlation is complete and positive, while the coefficient -1.0 indicates that the correlation is complete and negative. The absolute value of the coefficient of correlation shows the strength of the relationship between the variables. When ρ is closer to zero, the connection is weaker, and the closer the unit is to 1, the connection is stronger.

In the risk analysis, Pearson's linear correlation coefficient is used as a measure of the relationship between the two variables. This study analyzes which variable has a positive impact on ROA, and which variable has the greatest negative impact on ROA and why. It is denoted by r and is obtained using the following equation:

$$r = \frac{\sum_{i=1}^{N} X_i Y_i - N \times \overline{X} \times \overline{Y}}{\sqrt{\left(\sum_{i=1}^{N} X_i^2 - N\overline{X}^2\right)\left(\sum_{i=1}^{N} y_1^2 - N\overline{Y}^2\right)}}$$

By using the determination coefficient and the adapted determination coefficient, this study deals with the model description and the deviation of independent variables. The Durbin-Watson statistic is used to provide an autocorrelation overview of the observed variables.

Empirical data and analysis

This study analyzes the determinants of profitability of non-life insurance companies in the Serbian insurance market. So far, only few studies have been carried out on determinants of the profitability of non-life insurance companies in the Serbian insurance market. Therefore, this analysis aims to contribute to a more detailed analysis of the Serbian insurance market and at the same time provide useful information for all insurance companies in the Serbian insurance market, as well as for investors, experts from the aforementioned area and state supervisory authorities. The analysis is based on available data from official financial statements of insurance companies, as well as reports by competent state authorities.

Table 2 shows descriptive statistics for all variables taking into account 95 observations. Based on the data obtained in the Table, it can be noted that the income on total assets fluctuates between -81.15 and 19.40%, with an average value of -1.96%. Due to the fact that some insurance companies had negative financial results in the observed period, the ROA deviates from an average value of around 11.10%.

Results obtained by regression analysis indicate that the correlation coefficient is R = 0.919. The determination coefficient is R Square = 84%, and the adjusted coefficient

Table 2: Descriptive statistics of insurance companies for the 2010-2015 period

	Size of company	Company growth	Premium growth	Liquidity ratio	Debt ratio	Operating costs	Underwriting risk	Financial leverage	Profit growth
N	95	95	95	95	95	95	95	95	95
Mean	6.5966	21.3%	13.5%	26.0%	35.8%	24.6%	222.5%	35.6948	-6.9%
Median	6.5328	9.4%	8.9%	12.5%	26.1%	6.5%	200.0%	19.2800	0.9%
Mode	5.8355	-27.9%	-63.8%	0.3%	4.4%	4.3%	0.2%	1.19	0.3%
Std. Deviation	0.5353	101.3%	35.6%	35.0%	24.6%	115.1%	218.9%	55.7879	45.6%
Minimum	5.8355	-27.9%	-63.8%	0.3%	4.4%	0.3%	0.2%	1.19	-266.3%
Maximum	7.6406	969.8%	178.6%	245.4%	97.4%	1125.2%	1716.7%	350.59	89.7%

Source: Authors' calculation.

Table 3: Model summary

Model	R	R Square	Adjusted R square	Std. error of the estimate	Durbin-Watson
1	.919	.844	.827	4.66031	1.998

Source: Authors' calculation.

of determination is 0.83. The result of the Durbin-Watson's multicollinearity test of 1.998 (it should be close to 2) confirms the validity of the model.

The result of the multiple linear regression model: p = .000 is less than p = 0.05, which means that there is a significant influence of independent variables on the start of ROA, i.e., the presented model is statistically significant.

It is evident from Table 5 that almost half of the explanatory variables slightly positively correlate with one another, while the other half slightly negatively correlate with each other. Given that the subject of the analysis is the influence of independent variables on the dependent variable and the profitability of non-life insurance companies, it can be noted that the strongest positive correlation between ROA and profit growth (0.844), for a significant level of 0.01, indicates the fact that profit grew faster than the income of insurance companies. On the other hand, the strongest negative correlation is noted between the ROA and the financial leverage, as there was an increase in the indebtedness of the insurance companies and the shifting of the capital structure in favor of borrowed capital.

Table 4: ANOVA

Model		Sum of squares	Df	Mean Square	F	Sig.
1	Regression	9769.015	9	1085.446	49.978	.000b
	Residual	1802.632	83	21.718		
	Total	11571.648	92			

Source: Authors' calculation.

Table 5: Pearson correlation

		ROA	Size of company	Company growth	premium growth	Liquidity ratio	Debt ratio	Operating costs	Underwriting risk	Financial leverage	Profit growth
ROA	Pearson correlation	1	.260	.049	-.005	-.114	-.108	-.029	-.133	-.182	.844**
	Sig. (2-tailed)		.011	.642	.959	.270	.295	.778	.199	.077	.000
	N	95	95	95	95	95	95	95	95	95	95
Size of company	Pearson correlation	.260	1	.105	-.133	-.378**	-.716**	-.219*	.296**	.154	.239
	Sig. (2-tailed)	.011		.319	.202	.000	.000	.033	.004	.135	.020
	N	95	95	93	93	95	95	95	95	95	95
Company growth	Pearson correlation	.049	.105	1	.108	.129	-.118	-.033	.078	.042	.021
	Sig. (2-tailed)	.642	.319		.303	.217	.259	.752	.459	.687	.839
	N	93	93	93	93	93	93	93	93	93	93
Premium growth	Pearson correlation	-.005	-.133	.108	1	-.086	.140	.227	-.051	-.051	-.242
	Sig. (2-tailed)	.959	.202	.303		.412	.180	.029	.628	.625	.019
	N	95	95	93	95	95	95	95	95	95	95
Liquidity ratio	Pearson correlation	-.114	-.378**	.129	-.086	1	.505**	.094	-.345**	-.234*	-.097
	Sig. (2-tailed)	.270	.000	.217	.412		.000	.365	.001	.023	.349
	N	95	95	93	93	95	95	95	95	95	95
Debt ratio	Pearson correlation	-.108	-.716**	-.118	.140	.505**	1	.350**	-.646**	-.473**	-.175
	Sig. (2-tailed)	.295	.000	.259	.180	.000		.001	.000	.000	.089
	N	95	95	93	93	95	95	95	95	95	95
Operating costs	Pearson correlation	-.029	-.219	-.033	.227	.094	.350**	1	-.159	-.095	-.147
	Sig. (2-tailed)	.778	.033	.752	.029	.365	.001		.125	.358	.154
	N	95	95	93	93	95	95	95	95	95	95
Underwriting risk	Pearson correlation	-.133	.296**	.078	-.051	-.345**	-.646**	-.159	1	.824**	.039
	Sig. (2-tailed)	.199	.004	.459	.628	.001	.000	.125		.000	.709
	N	95	95	93	93	95	95	95	95	95	95
Financial leverage	Pearson correlation	-.182	.154	.042	-.051	-.234	-.473**	-.095	.824**	1	-.025
	Sig. (2-tailed)	.077	.135	.687	.625	.023	.000	.358	.000		.813
	N	95	95	95	95	95	95	95	95	95	95
Profit growth	Pearson correlation	.844**	.239	.021	-.242	-.097	-.175	-.147	.039	-.025	1
	Sig. (2-tailed)	.000	.020	.839	.019	.349	.089	.154	.709	.813	
	N	95	95	95	95	95	95	95	95	95	95

Source: Authors' calculation.

Table 6: Regression analysis of the coefficients of non-life insurance companies in the Republic of Serbia

Coefficients[a]								
Model		Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-13.647	10.440		-1.307	.195		
	Size of company	2.507	1.389	.118	1.805	.075	.437	2.291
	Company growth	.000	.005	-.003	-.075	.940	.894	1.118
	Premium growth	.060	.015	.192	4.121	.000	.861	1.161
	Liquidity ratio	-.018	.022	-.044	-.812	.419	.653	1.531
	Debt ratio	-.128	.046	-.269	-2.803	.006	.204	4.895
	Operating costs	.268	.059	.329	4.522	.000	.354	2.822
	Underwriting risk	-.009	.005	-.173	-1.918	.059	.229	4.360
	Financial leverage	-.015	.016	-.075	-.959	.340	.305	3.277
	Profit growth	.237	.012	.969	19.006	.000	.722	1.386

Source: Authors' calculation.

On the basis of the data obtained from Table 6, it can be concluded that the obtained VIF is lower than the reference value of 5, which means that there is no multicollinearity present. Taking into account the individual impact of independent variables on the profitability of non-life insurance companies, it can be concluded that the following variables: growth in premiums, debt ratio, operating costs and profit share in revenue (profit growth), had a significant impact on the profitability of insurance companies.

Results and discussion

Based on the results obtained by applying multiple linear regression, it can be concluded that the resulting correlation coefficient of 0.919 indicates that there is a complete correlation between the dependent variable, i.e., ROA and independent variables: size of company (A), company growth, premium growth, liquidity ratio, debt ratio, operating costs, underwriting risk, financial leverage and profit growth.

The coefficient of determination R = 84%, and the custom determination coefficient of 0.83, indicates that 83% of the deviations of independent variables are described in this model, which makes the model relatively representative. The obtained results indicate that the growth of premiums of non-life insurance companies influences ROA in a statistically significant way, since Sig. = .000, which is less than 0.05. Also, the growth of the premium positively influenced the growth of ROA. The debt ratio

affected ROA in a statistically significant way, as Sig. = .006, which is less than 0.05. However, the increase in debt ratio affected the decrease of the value of ROA of non-life insurance companies, which is the result of the rise in the indebtedness of insurance companies in the observed period. Operating costs also have a statistically significant impact on ROA insurance companies, as Sig. = .000, which is less than 0.05. The increase in this value positively influenced ROA, which is explained by a steady increase in the premium of insurance companies compared to the increase in the cost of earnings. The share of profit in revenues (profit growth) affected ROA of non-life insurance companies in a statistically significant way, since Sig. = .000, which is less than 0.05. The change in this value positively affected the movement of ROA, which is a consequence of faster growth of profit compared to the total revenues.

The size of the insurance companies positively influenced ROA, however this influence is not statistically significant because Sig = .075, which is greater than 0.05. The increase in the size of the insurance companies did not affect ROA of insurance companies, nor did the increase affect ROA in a statistically significant way, as Sig. = .940. The liquidity ratio of insurance companies did not affect ROA significantly, as Sig. = .419 – the increase in this value negatively affected the value of ROA. This impact indicates that there has been a faster rise in short-term liabilities compared to the working capital of insurance companies. Underwriting risk and financial leverage did not affect ROA in a significant way since Sig. = .059,

or Sig = .340. These two variables negatively influenced the value of ROA, which was caused by faster growth of borrowed capital in relation to the total premium and the total liabilities of non-life insurance companies in the observed period.

Conclusion

The results of the analysis regarding these hypotheses show that the profitability of non-life insurance companies in Serbia in the observed period varied from year to year. The analysis confirms the starting hypotheses that the statistically significant impact on the profitability of non-life insurance companies is achieved by the increase in premiums, the debt ratio, operating costs and revenue sharing. Other variables, such as company size, company growth, liquidity, underwriting risk or financial leverage, do not have a statistically significant impact on the profitability of non-life insurance companies. These results contribute to the scarce empirical research regarding the profitability of non-life insurance companies in Serbia, given the much higher share of non-life insurance in relation to life and other types of insurance in the overall insurance portfolio.

The previous literature and empirical research indicate that in most countries, the size of the company has a considerable influence on the profitability of insurance companies, especially in the case of more developed countries. Growth and size of companies have given them numerous benefits, including diversification, insolvency reduction, lower costs, higher revenue efficiency and higher market power. The results of this analysis show that the size of a company as well as its growth do not have a statistically significant impact on the profitability of insurance companies in the insurance market of Serbia, and that the structure of the capital of insurance companies is shifted in favor of borrowed capital, which has led to financial difficulties for a number of insurance companies.

However, this analysis has certain limitations that are reflected in the uncertainty of the operations of individual insurance companies, whose business performance had dynamic movements, resulting in the liquidation of individual insurance companies, purchase of individual insurance companies by other insurance companies,

and the simultaneous entry of other foreign insurance companies to the insurance market of Serbia. Given that the insurance market in Serbia is in development and relatively lagging behind the markets of other European countries, the implementation of Solvency II will be a major challenge for insurance companies.

The basis of the new regulation will be estimating the necessary amount of capital, where there will be a change in the necessary amount of capital for ensuring solvency in all types of insurance, changes in the ways of calculating the solvency margin, the application of internal models and the standard formula. All this will represent a special challenge for the insurance companies in the insurance market in Serbia, which will affect the changes in many variables of the profitability of insurance companies, where other variables will have to be taken into account, especially for those companies which had an insufficient or inadequate risk taking system in the past.

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