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PROFITABILITY DETERMINANTS IN THE SERBIAN INSURANCE SECTOR: A PANEL DATA APPROACH

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ABSTRACT

The aim of this paper was to analyze profitability determinants in the insurance sector of the Republic of Serbia. The study relies on empirical research that involves the evaluation of panel regression models including all insurance companies that operated in the Republic of Serbia in the period 2005 – 2021. The data are collected from the financial statements published by the National Bank of Serbia, covering unbalanced panel that includes a total number of 32 life insurance, non-life insurance and reinsurance companies. The results of the panel regression models indicate that insurance-specific variables have a significant and robust role in determining financial performance, whilst macroeconomic variables seem to affect profitability to a lesser extent. Besides insurance-specific variables, market concentration also appears as the significant determinant of insurance sector performance, being positively associated with profitability indicators.

***Keywords**: insurance sector, concentration, determinants of profitability*

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INTRODUCTION

Insurance is one of the key drivers promoting economic development [1]. The greatest part of the financial sector in the Republic of Serbia consists of the banking sector but the insurance sector has been growing from year to year. Despite variations in the number of insurance companies during the observed period – from 16 in 2005 to 28 in 2013 and then 20 at the end of 2021, total insurance premiums had an average growth of 9% per year. In the last year of the observed period out of 20 insurance companies, there were four reinsurance companies, four life insurance companies, six non-life insurance companies and six life and non-life insurance companies.

According to the National Bank's official report in 2021, the estimated global real growth of non-life insurance premiums was 3,3%, whereby in developed countries it estimates a growth of 2,8%, and in developing countries a growth of 5,8%. The estimated global real growth of life insurance premiums in the same year was 3,5% - in developed countries 4,1% and 1,4% in developing countries.

The level of development of the insurance sector in the Republic of Serbia is still significantly below the average of the member states of the European Union. The share of total insurance premiums in the gross domestic product of RS was 2,0% in 2020 while in the EU it is 6,9%. The premium per capita in RS was 155 US dollars and 2.335 US dollars for EU while for developing countries of EU and central Asia premium per capita was 159 US dollars. Considering that, the level of development of the insurance sector in Serbia is satisfying with great improvement potential.

LITERATURE REVIEW

Kozak used a panel of 25 non-life insurance companies to study the factors that affect the profitability of non-life insurance companies in Poland between 2002 and 2009. [2]. Using three profitability ratios and one efficiency ratio as dependent variables he concluded that the value of gross premiums collected by the company positively influences the profitability and efficiency of the company. Besides, the reduction of the level of a company's operating costs, the increase in foreign ownership and gross domestic product growth positively contribute to the companies` profitability. On the contrary, too extensive a range of offered classes of insurance, the share of motor insurance in the company's insurance portfolio, and the value of the company's investments are negatively associated with the profitability of the core insurance business.

Using return on assets as a measure of profitability as the dependent variable, Pjanić et al. (2018) analyzed the effects of internal factors on the operations of non-life insurance businesses in Serbia, including asset size (company), asset growth, premium growth, total revenues, liquidity ratio, debt ratio, financial leverage, underwriting risk and operating costs. [3]. They applied the multilinear regression modelling to sample of 95 observations in the period 2010-2015. The results indicate a positive correlation between ROA and premium growth, operating costs and profit growth while a negative correlation between ROA and debt ratio is observed. Other variables used in the regression model do not have a statistically significant impact.

The multiple regression model is used to investigate the determinants of profitability in insurance companies of Pakistan including 35 life and non-life insurance companies which cover the period 2005-2009 [4]. Secondary data were obtained from the financial statements to identify the relationship between the profitability of insurance companies using return on assets and age of the company, leverage ratio, loss ratio, company size, and volume of capital. The findings indicate that size and capital volume are positively related to profitability, while age, debt, and loss ratio are negatively associated with profitability.

Using the OLS and GLS estimators, Vojinović, Milutinović, and Leković estimated a fixed effects model on a panel data set of 19 insurance companies in Serbia from 2008 to 2016. They used three profitability ratios as dependent variables such as return on asset (ROA), return on equity (ROE) and return on total premium (ROTP) as the response variables. The findings demonstrate the significant influence of risk exposure, size and business specialization (life over non-life insurance, insurance over reinsurance) on profitability. Accordingly, managers should concentrate on risk exposure control and advanced liquidity management in order to boost profitability. [5].

Another conducted research for the insurance sector in Serbia examines the functioning of companies operating in non-life insurance business. This research uses CARMEL indicators and regression modelling to analyze financial statements of non-life and composite insurers covering the period 2006-2013 [6].

Coefficients estimated by the fixed effects estimator indicate negative impact of the combined ratio, leverage and retention rate negatively on the profitability of nonlife insurance companies in Serbia, while positive impact is indicated for the variables premium rate of growth, investment ratio, and company size.

Burca and Batrinca examined the factors influencing the financial performance of the insurance market in Romania during the 2008–2013 period using a balanced panel database. Out of the total 41 insurance companies that operated in the Romanian insurance market in 2012, 21 companies were selected if these companies had a cumulative share of approximately 70% in 2012. The specified model uses return on assets as a dependent variable and set of regressors that includes equity, total market share, diversification, underwriting risk, reinsurance dependence, retained risk ratio, solvency margin, investment ratio, GDP per capita growth, insurance leverage, company size and years operating at the market. The results indicate that the financial performance of insurance companies is determined by internal factors but also by the macroeconomic environment [7].

Alhassan, Addisson and Asamoah analyzed the impact of efficiency and market structure on profitability using panel data on 36 life and non-life insurance companies in Ghana from 2007 to 2011. The authors tested Structure-Conduct-Performance hypothesis (SCP) and the efficient structure hypothesis (ES) and the dependent variable was return on assets [8]. As for the measures of the market structure, HHI and CR4 were used and the DEA technique was employed in estimating efficiency. Besides efficiency as independent variable size, leverage and risk were used as firm-specific and inflation and GDP growth were used as macroeconomic variables. The research results provide evidence in support of the ES hypothesis and the SCP hypothesis was rejected.

Öner Kaya investigated the effects of firm-specific factors on the profitability of 24 non-life insurance companies in Turkey in the period 2006-2013 using panel annual data sets [9]. In the panel data regression model as dependent variables, the technical profitability ratio and the sales profitability ratio were used. The results show small non-life insurance companies have lower profitability than large non-life insurance companies. Also, the results underscore that special attention should be paid to exposure to underwriting risk and low liquidity insurance companies will achieve higher profitability than highly liquid insurance companies.

Most of the paper that analyzed determinants of profitability used ROA [10] [4] [11] [12] [13] [14] [15] [16] [17] [18] [19] [20] [3] [21] and ROE [12] [17] [22] [23] [18] [19] [20] [21] as dependent variable and measure of profitability.

METHODOLOGY

Following the aim of the research, the modeling approach is based on the estimation of the panel regression models. The unbalanced panel includes all insurance companies that operated in the Republic of Serbia in the period 2005 – 2021. The data are collected from the financial statements published by the National Bank of Serbia, covering unbalanced panel that includes a total number of 32 life insurance, non-life insurance and reinsurance companies. The general model is specified as follows:

$$(1.1)\ \pi_{it} = c + \sum_{k=1}^{K} \beta_k X_{it}^k + \sum_{l=1}^{L} \beta_l X_t^l + \sum_{m=1}^{M} \beta_m X_t^m + \varepsilon_{it},$$

$$\varepsilon_{it} = v_i + u_{it},$$

where π is the profitability of insurance company i at time t, (i=1,…,N; t=1,…,T), c is a constant term, X_{it} and X_t are explanatory variables, whereas k are insurance specific variables, l are concentration sector variables, m are macroeconomic variables and ε_{it} is the disturbance with v_i the unobserved insurance-specific effect and u_{it} idiosyncratic error. Table 1 shows all variables included in the regression model.

Table 1. Dependent and explanatory variables

Variable	Ratio	Notation	Expected effect
Profitability	Return on total assets Return on total equity	roa roe	Dependent variables
Size	Ln (total assets)	size	Positive
Risk	Technical reserves/total premium	risk	Positive
Leverage	Liabilities to equity	leverage	Negative
Concentration	Herfindahl-Hirschman index based on total assets	hhi_a	?
	Herfindahl-Hirschman index based on total premium	hhi_prem	?
Macroeconomic	GDP growth	gdp_growth	Positive
	Inflation	infl	Negative
	Average rate	av_wage	Positive

Source: Authors

Due to the literature review, ROA and ROE were used in the linear regression model as dependent variables. In the group of insurance-specific variables *size*, *risk* and *leverage* are included. As the concentration measure, the Herfindahl-Hirschman index was applied based on total assets and total premiums. In some sectors, high concentration leads to greater market power and hence to higher profitability. On the other hand, some sectors with a lower concentration lead to a higher level of competition and thus greater profitability. In the group of macroeconomic variables *gdp growth*, *inflation* and *average wage* are included.

RESEARCH RESULTS

Table 2 shows the results of four panel regression models and the total number of observations is 375. Based on the results of the Hausman tests, the regressions were evaluated using the fixed effects estimator. The R squared means that 15-23% of the total variability of the return on equity/assets variable is explained by the independent variables included in the model.

Table 2. Panel estimation results

	roa1	roa2	roe3	roe4
hhi_a	0.0001***		0.0004***	
	(0.0000)		(0.0001)	
hhi_prem		0.0001***		0.0005***
		(0.0000)		(0.0001)
size	0.1007***	0.1243***	0.4802***	0.5767***
	(0.0276)	(0.0314)	(0.1368)	(0.1504)
gdp_growth	-0.0016**	-0.0018*	-0.0038	-0.0055**
	(0.0008)	(0.0009)	(0.0039)	(0.0024)
infl	0.0028*	0.0022	0.0077**	0.0053*
	(0.0016)	(0.0014)	(0.0031)	(0.0028)
av_wage	0.0000	0.0001	0.0005*	0.0008**
	(0.0001)	(0.0001)	(0.0003)	(0.0003)
risk	0.0001***	0.0001***	0.0004***	0.0004***
	(0.0000)	(0.0000)	(0.0001)	(0.0001)
leverage	-0.0467***	-0.0468***	-0.2221***	-0.2219***
	(0.0102)	(0.0106)	(0.0424)	(0.0439)
_cons	-0.7957***	-0.9865***	-3.6788***	-4.4973***
	(0.2025)	(0.2538)	(0.9210)	-10.880
No. of Obs.	375.00	375.00	375.00	375.00
R-Squared within	0.15	0.15	0.22	0.23

Source: Authors

As long as the Herfindahl-Hirschman index based on total assets and total premium is positive and statistically significant at the level of 1% it can be concluded that insurance companies had a higher profitability when the insurance market was more concentrated. This can be the consequence of the high market power – in the observed period concentration ratio of the four leading insurance companies was 60-77%. The variable *size* is also significant and positive at the level of 1%, so the greater value of assets influenced profitability. The *gdp_growth* has a significant and negative impact on profitability in three out of four regression models as long as inflation, but the impact is positive. The average wage is significant in two out of three models at the level of 5% and 10% and the impact is positive. Variables risk and leverage are both significant at the level of 1% in all regression models. The higher values of technical reserves to total premium have a strong positive impact on profitability and the higher leverage has a strong negative impact on profitability.

CONCLUSION

This paper focused on the evaluation of the determinants of the profitability function in the insurance sector in the period 2005-2021 covering a total number of 32 life insurance, non-life insurance and reinsurance companies that operated in the observed period. Considering insurance-specific variables, it can be concluded that insurance companies with higher assets value, higher technical reserves to total premium and lower leverage had higher profitability. Macroeconomic variables did not have such a strong impact on profitability in the insurance sector of the Republic of Serbia.

According to values of the Herfindahl-Hirschman index values (based on total assets and total premiums) that were in the range 1111-2138, it can be concluded that the insurance sector of the Republic of Serbia was medium to high concentrated. In the times of high concentrated insurance sector, insurance companies were more profitable, and this can be explained by high market power of the leading companies. As mentioned, the concentration ratio of the four leading insurance companies was 60-77% in the observed period and in this case, the market structure can be described as an oligopoly. It can be concluded that there is a statistically significant and systematic influence of the level of market concentration on the profitability of the insurance sector in the observed period.

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