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Effects of corporate diversification on firm performance: evidence from the Serbian insurance industry

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ABSTRACT

The aim of this paper is to provide empirical evidence on the relation between line-of-business diversification and performance for the insurance companies that operated in the republic of Serbia in the period 2004–2014. The research results show that the relation between risk-adjusted returns measured both by return on assets and return on equity and line-of-business diversification and performance measured by entropy is significant and positive, which means that diversified insurers outperform undiversified insurers. These results could be useful in decision making for insurance companies as they suggest the need for diversification (specialisation), growth in size, capitalization and affiliation (grouping).

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1. Introduction

The development of insurance as a key form of risk financing in Serbia is influenced by the general economic development. Before the Second World War the insurance industry was underdeveloped and dominated by foreign insurers. After the Second World War it developed in a socialist economic environment where 'private insurance was neither much needed nor purchased' (Dorfman, 2008, p. 76). During the transition period, which started in the 1990s, privatisation incentivised the development of risk management and the growth of demand for insurance. 'The pace of growth and subsequent possibility for profit generation, the need for servicing their multinational customers and geographical risk spreading have attracted foreign insurers to Serbian life and non-life insurance markets' (Njegomir & Stojic, 2010b).

According to 2014 data, the non-life insurance premium amounted to U.S.$87 per capita while the life insurance premium per capita amounted to merely U.S.$24 (Sigma 4, 2015). As the share of life insurance in total insurance premiums is only around 20% in Serbia, we have decided to analyse the total insurance premium as an adequate representative of insurance companies' activities, though we control for an insurer's participation in both industries.

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Theory suggests that diversification is associated with both costs and benefits. If there is sharing in the production process, which is associated with concentration, costs for joint production will be lower than the sum of the costs for producing each product separately (Teece, 1980). The diversification benefit can stem from efficient internal government mechanisms (Williamson, 1985). Product diversification is analysed in a context of performance of insurers that focus on either the life–health or property–liability industry, and insurers that diversify across both industries (e.g., Cummins, Weiss, Xie, & Zi, 2010; Foong & Idris, 2012; Hardwick & Adams, 2012; Meador, Ryan, & Schellhorn, 2000). There is still little evidence for the performance effect of diversification or focus within the life or non-life insurance industry. Line-of-business diversification and the performance relation of property and liability or non-life insurers is analysed in several studies (see, e.g., Berry-Stolzle, Liebenberg, Ruhland, & Sommer, 2012; Elango, Ma, & Pope, 2008; Liebenberg & Sommer, 2008; Pavic & Pervan, 2010). To our knowledge, there is no previous research and empirical evidence on the performance effect of diversification in the Serbian non-life insurance industry.

In response to market deregulation many insurance companies wanted to take advantage of diversification across, not only life or non-life, but also within the non-life insurance industry. This is why we are interested in doing empirical research on the effects of business line diversification within the non-life insurance industry; these effects are still unclear. Therefore, the aim of this paper is to provide empirical evidence of the impact of line-of-business diversification of non-life insurance companies on their performance. Following theory and previous empirical research we test two hypotheses: *the conglomeration hypothesis*, which emphasises the benefits associated with diversification with a positive impact on performance, and *the strategic focus hypothesis*, which emphasises the costs of diversification with a negative impact on performance.

The findings of this study will be of particular importance for the management of insurance companies as they define business strategies and diversification plans in the hope of better positioning themselves in the market. The study results will provide governments with information necessary to determine policies regarding incentive and disincentive measures for product diversification, life and non-life diversification, grouping, capitalization, firm size and competitive policies that will facilitate the performance of insurance companies. Insurance performance is not only in the interest of insurance companies themselves but also in the interest of governments, as increased performance can facilitate the achievement of greater social welfare.

The reminder of this article is organised as follows. The second section reviews the literature. The third section presents a theoretical framework that encompass the hypotheses and the explanation of variables used in the research. The fourth section presents the data and the empirical methodology employed in the analysis. The empirical results are presented in the fifth section, which is followed by the conclusions.

2. Literature review

Research with a focus on the relative performance of diversified versus specialised firms has been done theoretically and empirically in the fields of corporate finance, industrial organisation, and strategic management for more than 30 years (Santalo & Becerra, 2008, p. 3). Some researchers have focused on diversification and performance relationships across

industries, including insurance and other industries (e.g., Grant, Jammine, & Thomas, 1988; Santalo & Becerra, 2008; Selcuk, 2015; Servaes, 1996; Volkov & Smith, 2015), while most of the empirical research studies have focused on specific industries, such as the finance industry (for a review of studies see Martin and Sayrak (2003)). Research studies that provide empirical evidence of diversification and conglomeration in the insurance industry are by Hoyt and Trieschmann (1991), Meador et al. (2000), Berger, Cummins, Weiss, and Zi (2000), Cummins and Nini (2002), Li and Greenwood (2004), Elango et al. (2008), Liebenberg and Sommer (2008), McShane and Cox (2009), Cummins et al. (2010), Pavic and Pervan (2010), and Berry-Stolzle et al. (2012). As our study is primarily focused on the determination of diversification and strategic focus, and their relationship with insurance companies' performance, we will provide a more detailed review of these studies.

Some of the first researchers in the insurance industry who studied strategic focus and conglomeration hypotheses were Hoyt and Trieschmann (1991). Their study focuses on a risk–return comparison for life–health, property–liability, and diversified insurers for the period 1973–1987. They analyse risk–return relationships using mean-variance and CAPM (Capital Asset Pricing Model) approaches. The results of the study give evidence that specialised insurers performed better over the sample period.

Berger et al. (2000) provide evidence on the validity of the conglomeration hypothesis versus strategic focus hypothesis for financial institutions using data on U.S. insurance companies. They use profit scope economies, which measure the relative efficiency of joint versus specialised production, to distinguish between the conglomeration and strategic focus hypotheses. Their results suggest that the conglomeration hypothesis dominates for some types of financial services providers and the strategic focus hypothesis dominates for other types.

Meador et al. (2000) focus on the relationship between a firm's output choice and measures of X-efficiency. Using data for the life insurance industry for the period 1990–1995 they find that diversification across multiple insurance and investment product lines resulted in greater X-efficiency than a more focused production strategy.

Cummins and Nini (2002) investigate the use of capital by insurers to provide evidence on whether the capital increase represents a legitimate response to changing market conditions or a true inefficiency that leads to performance penalties for insurers. Their empirical analysis includes a regression of performance on capitalization and several controls, including line-of-business diversification. They find an inverse relation between diversification and Return on equity.

Li and Greenwood (2004) examine the effect of diversification upon intra-industry performance in the Canadian general insurance industry. Their test of a theoretical model indicates that mutual forbearance provides advantage under specified conditions, that market structuration also provides advantages, but that diversification per se does not.

Liebenberg and Sommer (2008) examine performance as a function of line-of-business diversification and other correlates for a sample of property–liability insurers for the period 1995–2004. Their results indicate that undiversified insurers consistently outperform diversified insurers. They find a diversification penalty of at least 1% of return on assets or 2% of return on equity. They find some additional interesting results. They find that capitalisation and size are positively related to performance, that insurance groups underperform compared to unaffiliated insurers, and that stock insurers outperform mutual insurers.

Elango et al. (2008) examine the relationship between product diversification and firms' performance in the U.S. property–liability insurance industry for the period 1994–2002. They find that the extent of product diversification shares a complex and nonlinear relationship with firms' performance and that performance benefits associated with product diversification are contingent upon an insurer's degree of geographic diversification.

McShane and Cox (2009) examine what makes these long-term care insurers different and whether managers are following a diversification or strategic focus strategy. They find that strategic focus is a consistently important factor and that managers' participation and volume decisions are made independently.

Cummins et al. (2010) examine economies of scope in the U.S. insurance industry over the period 1993–2006. They analyse whether it is advantageous for insurers to offer both life–health and property–liability insurance or to specialise in one major industry segment. They find that property–liability insurers realise cost scope economies, but they are more than offset by revenue scope diseconomies. On the other hand, they find that life–health insurers realise both cost and revenue scope diseconomies and conclude that strategic focus is superior to conglomeration in the insurance industry.

Pavic and Pervan (2010) examine the performance effect of diversification in the Croatian non-life insurance industry for the period 2004–2007. Their results indicate that both measures of diversification have a negative and statistically significant influence on profitability.

Berry-Stolzle et al. (2012) examine variations in line-of-business diversification status and extent among property–liability insurers for the period 1996–2006. Their results show that the extent of diversification is not driven by risk pooling considerations; insurers operating in more volatile business lines do not diversify more. Using a measure of unrelated line-of-business diversification they find support for the diversification prediction of the managerial discretion hypothesis, that mutual insurers should be less diversified than stock insurers. While mutual insurers tend to exhibit higher levels of total diversification, they engage in significantly less unrelated diversification than do stock insurers.

Although the results of most studies of the strategic focus hypothesis versus the conglomeration focus hypotheses in the insurance industry shows results that are in favour of the strategic focus hypothesis, there is still a lack of consistency at the international level. This, together with the lack of similar studies for the Serbian non-life insurance industry, served us as a motivator for an analysis of the topic.

3. Theoretical framework

In this article we investigate whether the product diversification or product specialisation strategies are better for insurance companies' financial performance.

Intra-industry diversification promises three sets of benefits which, separately and in combination, provide firms with a competitive advantage: synergies arising from economies of scope, premiums from mutual forbearance enabled by multi-market competition, and efficiencies derived from market structuration (Li & Greenwood, 2004). The diversification in property–liability insurance may exploit cost-scope economies by sharing administrative expenses, marketing costs, and fixed costs, and may exploit scope economies in providing various commercial lines of business as business owners may prefer the convenience of purchasing all commercial insurance from one insurer (Chen, Lai, & Wang, 2007). Cost-scope economies arise from the sharing of fixed production costs across several businesses within the firm (Teece, 1980). The

diversification also provide risk reduction economies of scope, larger internal capital markets, and greater market power (see, e.g., Besanko, Dranove, Shanley, & Schaefer, 2007; Cummins & Danzon, 1997; Cummins, Phillips, & Smith, 2001; Cummins & Trainar, 2009; Montgomery, 1994; Stein, 1997). Scope economies can stem from the situation where firms may possess specific resources that can be utilised in diversified product markets (Penrose, 1995).

The product specialisation strategy suggests that specialised insurers may perform better than diversified ones. Product-specialised insurers can benefit from managers who can develop expertise for a few lines of insurance rather than many lines of insurance, and can achieve cost savings through fewer costs of hiring and training of actuaries, underwriters, and claim adjusters (Chen et al., 2007). As demonstrated in many empirical studies, diversified insurers are outperformed by diversified insurers (see, e.g., Cummins & Nini, 2002; Hoyt & Trieschmann, 1991; Liebenberg & Sommer, 2008; Pavic & Pervan, 2010). Diversification may increase agency costs (Aron, 1988; Harris, Kriebel, & Raviv, 1982; Rotemberg & Saloner, 1994) and lead to inefficient allocation of capital among divisions of a diversified firm (Rajan, Servaes, & Zingales, 2000; Stulz, 1990).

Following previous studies, and Liebenberg and Sommer (2008) in particular, we test the conglomeration hypothesis and the strategic focus hypothesis:

H_{01} (Conglomeration): diversification is positively related to performance.
H_{02} (Strategic focus): diversification is negatively related to performance.

The relationship between diversification and performance can be described as follows (Liebenberg & Sommer, 2008):

Performance = f(diversification; firm and industry characteristics)

Therefore, the performance of insurance companies does not only depend on diversification but also on other firm and industry characteristics. In this context we present the variables used in the quantitative research, where the dependant variable is the performance, while explanatory variables encompass diversification as well as other firm- and industry-specific characteristics.

Dependent variable

As measures of financial performance we use return on assets (*ROA*) and return on equity (*ROE*). The use of *ROA* and/or *ROE* as proxies for measurements of an insurer's financial performance are most common in the literature (e.g., Amit & Livant, 1988; Hill, Hitt, & Hoskisson, 1992; Lai & Limpaphayom, 2003; Mayer & Whittington, 2003; Pottier & Sommer, 1999; Wang, Jeng, & Peng, 2007). In line with Liebenberg and Sommer (2008) we perform an empirical analysis on both performance measures. In order to incorporate the effects of risk on returns, we observe risk-adjusted returns (*RAROA*, *RAROE*) by dividing the *ROA* (*ROE*) by the standard deviation of observed returns on assets (equity), respectively, over the previous five years.

Explanatory variables

Following the literature (see, e.g., Elango et al., 2008; Liebenberg & Sommer, 2008; Pavic & Pervan, 2010), for explanatory variables we use: product diversification within non-life

insurance, firm size, capitalization, industry concentration, type of insurance, affiliation, and ownership.

The most important variable for our analysis is product diversification. Following e.g., Liebenberg and Sommer (2008) we measure product diversification (*ENTROPY*) by distinguishing between undiversified firms operating in only one business line and diversified firms that operate in multiple business lines. Additionally, following Elango et al. (2008) and Pavic and Pervan (2010) we use the entropy measure (E). The entropy measure considers not only the number of products offered by a company but also the weighted distribution of a company's share in each product line. The entropy measure is calculated as

$$E = \sum_{i=1}^{I_L} P_i \ln \frac{1}{P_i}$$

where P_i is the percentage of an insurer's premiums written on product line i and I_L is number of insurance lines. If an insurance company operates in only one insurance line (i.e., exclusively focused company), the coefficient of entropy will take the value zero ($E = 0$). The maximum value that the entropy measure can take in a situation where a company has the same shares in all lines, is calculated as the natural logarithm of the number of insurance lines in the industry, $ln(I_L)$.

Firm size is found in previous studies (e.g., Cummins & Nini, 2002; Elango et al., 2008; Liebenberg & Sommer, 2008) to have a positive impact on the performance of insurance companies. Following the literature, we measure firm size as the natural logarithm of total assets. We expect that firm size is positively related to insurers' performance. We measure the firm size (*SIZE*) by the natural logarithm of a firm's total assets.

Well-capitalised insurers are considered to be safer by solvency regulators and rating agencies. Those insured are willing to pay a higher premium to insurers who are less likely to become insolvent (Sommer, 1996). Firm capitalisation is measured as the capital-to-asset ratio of the company (*CAPITALISATION*). We expect that firm capitalisation is positively related to insurers' performance.

The structure–conduct–performance paradigm implies that market performance is determined by market conduct, which in turn directly and indirectly depends on market structure. 'According to S-C-P hypothesis, higher profitability in any market is associated with anticompetitive behaviour induced by higher market concentration' (Njegomir & Stojic, 2010a). The support for the S–C–P hypothesis is abundant (e.g., Bajtelsmit & Bouzouita, 1998; Chidambaran, Pugel, & Saunders, 1997; Njegomir & Stojic, 2011; Pope & Ma, 2008). To capture the impact of the competitiveness of firms' markets on performance, we first calculate a Herfindahl-Hirschman concentration index for each line of business ($j = 1$ to I_L) across all firms ($i = 1$ to n) in each year t

$$HHI_{jt} = \sum_{i=1}^{n} \left(\frac{DPW_{ijt}}{DPW_{jt}} \right)^2$$

The larger the value of HHI_{jt}, the more concentrated is that line of business and 'the greater is the potential for super-normal profits' (Liebenberg & Sommer, 2008). We then calculate each firm's ($i = 1$ to n) participation in each line of business ($j = 1$ to I_L) for each year t

$$w_{ijt} = \frac{DPW_{ijt}}{DPW_{it}}$$

Using w_{ijt} as weights we then calculate the weighted sum of a firm's exposure to industry concentration across all of the lines in which it operates

$$WCONC_{it} = \sum_{j=1}^{23} w_{ijt} \, HHI_{jt}$$

Firms with small values for *WCONC* are exposed to competitive business lines. We expect *WCONC* to be positively related to performance.

Our study is primarily focused on the investigation of product diversification within the non-life insurance industry and insurers' performance. However, many insurance companies write life insurance in addition to non-life insurance. Therefore, following Liebenberg and Sommer (2008), we control for an insurer's participation in both industries by including a variable equal to the percentage of total premiums (non-life plus life) attributable to operations in the life insurance industry (*PCTL*). As this variable may indicate greater diversification, we expect it to have the same relationship with performance as product diversification within the non-life insurance industry.

Group affiliation is an increasingly common characteristic of today's financial services marketplace (Elango et al., 2008). There are both unaffiliated and affiliated insurers in the Serbian insurance market. Following previous studies (e.g., Cummins and Sommer, 1996, Elango et al., 2008; Liebenberg & Sommer, 2008; Sommer, 1996) we expect a negative relation between group affiliation and insurers' performance. We measure group affiliation by using a dummy variable (*GROUP*), equal to 1 if the unit of observation is a group.

In our sample we have insurers with different ownership structure, public or private, and majority-owned by domestic or foreign ownership. In order to control for ownership structure, we use two dummy variables, *PUBLIC*, to indicate whether insurers are publicly traded, and *FOREIGN*, to indicate whether an insurer is in foreign majority ownership. We hypothesise that publicly owned insurers should outperform privately held insurers, due to more effective corporate control (Liebenberg & Sommer, 2008), and that insurers in foreign majority ownership should outperform insurers in domestic majority ownership due to greater financial strength, know-how, and managerial expertise (Dorfman, 2008; Puri, 2007).

4. Data and methodology

Our research covers data for 23 insurance companies operating in Serbia for the period 2004–2014[1]. The authors disregarded companies that have been present in the market for less than five consecutive years due to the short time-series data and the inability to properly calculate the risk measure for their returns. Descriptive statistics for each variable depicting the firms' profitability is presented in Table 1.

Data were collected from various sources. Insurance premiums for each line of insurance and each company, companies' total assets, policy holder surplus, and net incomes were collected from the Serbian National Bank, which acts as a supervisor for the entire insurance market. Data for group affiliation, ownership structure, and whether companies are publicly traded, were collected from each of the companies' websites.

Given the cross-sectional and time-series data, to specify the model we observe the *ROA* (*ROE*) as a dependent variable, while the independent variable is entropy, i.e., product diversity. The model also includes the following explanatory variables: standard error of

Table 1. Descriptive statistics.

	Mean	Median	Maximum	Minimum	SD
ROA	−0.014	0.003	0.497	−0.458	0.107
ROE	−0.058	0.012	0.781	−5.687	0.509
SDROA	0.056	0.034	0.226	0.001	0.054
SDROE	0.150	0.094	2.559	0.007	0.284
ENTROPY	1.052	0.919	2.247	0.000	0.713
SIZE	14.552	14.451	17.212	12.381	1.316
CAPITAL	0.492	0.360	5.360	0.044	0.458
WCONC	0.560	0.059	4.942	0.000	1.008
PCTL	0.336	0.048	1.000	0.000	0.439
GROUP	0.679	1.000	1.000	0.000	0.468
PUBLIC	0.394	0.000	1.000	0.000	0.490
FOREIGN	0.715	1.000	1.000	0.000	0.453

Source: Authors' calculations.

Table 2a. ANOVA and Welch test. Dependent variable ROA.

Method	df	Value	Probability
Anova F-test	(22, 172)	7.331	0.000
Welch F-test	(22, 53.22)	7.040	0.000

Source: Authors' calculations.

Table 2b. ANOVA and Welch test. Dependent variable ROE.

Method	df	Value	Probability
Anova F-test	(22, 172)	1.728	0.028
Welch F-test	(22, 53.75)	8.491	0.000

Source: Authors' calculations.

the *ROA* (*ROE*), company size, capitalisation, share of life premiums, specific line market concentration, and three dummy variables: *GROUP*, *PUBLIC*, and *FOREIGN*.

The *ROA* (*ROE*) show no trend, hence both the F-test and the Welch test are acceptable for measuring individual and time effects. Both tests suggest we accept the alternative hypothesis that claims the existence of individual effects, as shown in Table 2(a) and (b).

We use the same test for testing time effects, that is, heterogeneity of the observed variable in time. The general equation to be estimated using pooled least squares is

$$y_{it} = \alpha_i + \gamma_t \, \mathbf{x_{it}} \beta + u_{it}$$

where y_{it} is a scalar dependent variable, i.e., the company's *ROA* (*ROE*), $\boldsymbol{xit}$ is a $K \times 1$ vector of independent variables, u_{it} is a scalar disturbance term, i indexes the company in a cross-section, and t indexes time, measured in years.

We further analyse whether the observed individual and time effects in the model should be specified as fixed or stochastic. We first estimate the model with stochastic effects, in order to apply the Hausman test for correlated random effects in Table 3.

There is strong evidence in support of hypothesis H_1 that the individual random effect model is not appropriate, therefore we adopt a model with country-specific and time-fixed effects.

All variables were tested for unit root using the Breitung (1999) test since both the LL test and the IPS test (Im, Pesaran & Shin, 2003) require $n \to \infty$ and $T \to \infty$ in the way that

Table 3. Hausman test.

Correlated random effects – Hausman test			
Test cross-section random effects			
Test summary	Chi square statistic	Chi square. d.f.	Prob.
Cross-section random	44.952	14	0

Source: Authors' calculations.

$N/T \to 0$. The variable *SIZE* is found to have a unit root in levels, but not in first differences, hence it is introduced in the model in the first differences, and is observed as the change in total assets for each company.

5. Empirical results

The model used in this study has been introduced above. In this section we present original results and interpretations concerning the model observed. The results consist of both dependent variables, *RAROE* and *RAROA*, and the estimated coefficients are presented in Table 4.

The preliminary results are in favour of the conglomeration hypothesis. Namely, the companies' returns measured both by *RAROE* and *RAROA* are positively correlated with the entropy, hence diversification is positively related to performance change in gross written premium per capita. This result is consistent with previous studies focused on developed insurance markets (e.g., Meador et al., 2000).

The size of the insurer significantly affects both returns on assets and returns on equity. Growth in total assets has a positive impact on returns at a 1% level. This result is in line with most of the insurance literature (e.g., Liebenberg and Sommer (2008).

Table 4. Parameter estimates.

Dependent variable: *ROE/SDROE*					Dependent variable: *ROA/SDROA*			
Method: panel least squares								
Total panel (unbalanced) observations: 170								
Variable	Coefficient	SE	*t*-Statistic	Prob.	Coefficient	SE	*t*-Statistic	Prob.
C	−1.317	7.512	−0.175	0.861	2.074	6.648	0.312	0.756
*ENTROPY***	4.913	0.546	9.000	0.000	2.857	0.483	5.913	0.000
PCTL	−1.205	2.232	−0.540	0.59	−15.109	19.754	−0.765	0.446
*D(SIZE)**	0.640	0.331	1.934	0.061	0.307	0.123	2.500	0.012
*WCONC***	0.575	0.289	1.987	0.049	0.525	0.256	2.052	0.042
*Y14***	−1.577	0.747	−2.110	0.037	−0.368	0.662	−0.557	0.579
*Y13***/**	−2.678	0.743	−3.607	4E-04	−1.563	0.657	−2.379	0.019
*Y12***/*	−1.977	0.712	−2.777	0.006	−1.022	0.630	−1.623	0.107
*Y11****	−2.875	0.723	−3.976	1×10^{-4}	−1.794	0.640	−2.802	0.006
*Y10***/*	−1.954	0.712	−2.745	0.007	−1.166	0.630	−1.851	0.066
*Y09***/*	−1.824	0.719	−2.538	0.012	−1.246	0.636	−1.960	0.052
*Y08***/*	−1.836	0.723	−2.539	0.012	−1.155	0.640	−1.804	0.073

R-squared	0.730	0.648	Mean dependent var	0.565	0.445
Adjusted R-squared	0.657	0.553	SD dependent var	3.280	2.541
SE of regression	1.920	1.699	Akaike info criterion	4.332	4.088
Sum squared resid	490.130	383.918	Schwarz criterion	5.015	4.770
Log likelihood	−331.224	−310.463	Hannan–Quinn criter.	4.609	4.365
F-statistic	10.010	6.808	Durbin–Watson stat	1.332	1.253

Note: ***, **, * denote statistical significance at 1%, 5%, and 10% levels, respectively.
Source: Authors' calculations.

The weighted sum of a firm's exposure to industry concentration across all of the lines in which it operates has a positive and significant effect at a 5% level on companies' performance. (Liebenberg & Sommer, 2008).

The time effects are captured through individual year dummies, and all of the significant variables are negatively correlated to returns. The table of company-specific effects is available upon request.

Regarding other explanatory variables, we find that the share of life insurance premiums within the total premiums does not affect the returns. The possible explanation lies in the fact that we are observing all insurance companies, hence life insurance is just one of the lines offered and as such does not have a significant influence on the total return. Also, dummy variables, which are used to test whether affiliates, publicly traded companies, and domestic companies generate different returns when compared to companies that are not groups, are not publicly traded, or are in foreign ownership, are found to be insignificant at all levels.

It is also interesting to see how the results correspond to individual companies, namely whether the size measured by the total premium collected affects the entropy and the profitability. We ran correlation tests for all companies as well as for the top five for each year observed.

The correlation coefficient between the size and the diversification ranges between 0.5 and 0.7 for all years and all companies. However, when we split the sample into two categories and observe only the top five insurers (which cover up to 75% of total premiums)[2] the correlation turns negative (at around –0.2 for all years). The seemingly odd results may be explained by either a small number of observation, or due to the internal management of specific companies.

6. Conclusions

The main objective of this article is to examine whether product diversification promotes the economic performance of insurance companies in Serbia. Additionally, we examined how firm size, industry concentration, capitalization, diversification across business lines, ownership structure, group membership, and public trading affects insurance companies' performance. Our sample covers the period 2004–2014. The model observed focuses on the effects of diversification measured by a company's entropy on risk-adjusted returns.

Our results are consistent with previous studies focused on developed countries. The insignificant impact of dummy variables signal urgent action towards the implementation of government measures in order to further develop the insurance industry as well as other industries dealing with financial services. The findings are important for Serbian policy makers as its economy is in desperate need of financial resources that would propel economic growth, which has been burdened by the limited available capital stocks and foreign debt.

The findings of this study will be of particular importance for the management of insurance companies, as they formulate business strategies and diversification plans in the hope of better positioning themselves in the marketplace. The study results provide governments with the information necessary to determine policies regarding incentive and disincentive measures for product diversification, life and non-life diversification, grouping, capitalization, firm size, and competitive policies that will facilitate the performance of insurance companies. Insurance performance is not only in the interest of insurance companies

themselves but also in the interest of governments, as increased performance can facilitate the achievement of greater social welfare.

A possible limitation of the research results could be the insignificance of most of the control variables appearing in models. Additionally, research related to the costs associated with both geographic and product diversification would aid management in devising cost-effective strategies that will facilitate higher firm performance. Further research should involve the testing of alternative hypothesis, namely geographic diversification, in pursue of higher significance levels for the explanatory variables. In addition, further research should include a greater number of countries to help the gaining of more consistent cross-country estimators.

Notes

1. The following companies are included in the research: AMS, AS, AXA nonlife, AXA life, Basler nonlife, Basler life, DDOR, Delta, Dunav, Energoprojekt, Globos, Grawe, Metlife, Merkur, Milenijum, Sava nonlife, Sava life, Societe Generale, Takovo, Triglav, Uniqa nonlife, Uniqa life, and Wiener
2. The top five companies are unchanged: Dunav, Delta, DDOR, Wiener, and Uniqa nonlife.

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