Dynamic Panel Analysis of B&H Insurance Companies' Profitability

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Abstract: A company's profitability has always attracted the attention of academics, policy makers and practitioners interested in revealing the main factors that determine business success. Although profitability has been widely investigated in manufacturing industries, far less attention has been paid to it in the financial sector. This is specially truth for the insurance companies. Accordingly, the aim of this paper was to investigate the factors that influenced insurance companies' profitability in the Bosnia and Herzegovina (B&H) during the period from 2005 to 2010. Furthermore, having in mind that researches of this kind were much less prevalent in developing than developed countries, additional intention was to provide further insight into the impact of different variables on insurers' performance in a developing country. Results of the conducted dynamic panel analysis revealed negative and significant influence of claims ratio on profitability; and significant positive influence of age, market share and past performance on current profitability. Additionally, foreign owned firms performed better than domestically owned, while the level of the insurers' diversification had no significant role in determining the profitability.

Key-Words: profitability, insurance, Bosnia and Herzegovina, developing country

1 Introduction

The development of the B&H insurance market followed those of other developing economies. This means that some of the crucial changes in the insurance industry occurred during the last two decade: state monopolies were privatized, entry barriers were reduced, foreign capital was entered the market, market structure was changed, the level and intensity of the competition was also changed, etc. All this changes influence on the company's profitability and therefore it is in the interest of every insurer to identify the factors that determine business success. The same is also important from broader economy point of view. Namely, successful insurance companies, both as risk management providers and intermediaries in process of funds transfer from surplus units to deficit economic units, could make important economic contributions. Accordingly, the aim of this paper is to determine direction and strength of different factors influencing companies' profitability. The analysis is even more important since, according to our best knowledge, the research of this kind has not been performed for B&H.

The paper begins with a presentation of the main characteristics of insurance industry in B&H. In Section 3 we undertake a literature review followed by the variables and methodology employed in the analysis. The empirical results are presented in the Section 5 followed by the conclusion.

2 Key development indicators in B&H insurance industry

After the breakup of former Yugoslavia (1992) and the end of the civil war (1995), the new constitution of B&H divided country into two entities: 1. Federation B&H and Republic Srpska (RS), and 2. Brčko District (a city which exists as an independent zone) [10]. Such a fragmentation of the insurance industry into parts that have different insurance regulations and complex institutional framework had (among other things) negatively influenced on the country's economic development. Not only that the legal and other regulatory regimes were not harmonized within Bosnia and Herzegovina, but they were not fully synchronized neither with the regulations of the European Union. As a consequence of this, too many insurance companies (26 of them, as presented in table 1) and other institutions with a small portfolio existed on the relatively small B&H market. However, it is to believe that the mergers and acquisitions together with the entrance of foreign capital will reduce the number of companies and induce new products and

services that will be of higher quality and greater variety.

From the total of 26 companies that operated on the B&H insurance industry in 2010, one of them was reinsurance company, two of them conducted exclusively life insurance business, 14 of them non-life insurance, while there were 9 companies doing both life and non-life insurance business. Regarding the ownership structure, it could be stated that the industry was still dominated by domestically owned companies (16 of them) while the remaining 10 companies were foreign-owned. Although foreign companies entered the market mainly by purchasing small private companies, some of them as well started with "Greenfield" investments.

Despite the fact that *gross written premiums* (GWP) was continuously growing during the period under the analysis (in 2010 amounted to 241 millions of EUR and thus represented an increase of more than 40% when compared to 2005 in which it was 170 millions of EUR), a significant decline of its *growth rate* occured in 2009 (table 1). However, one thing must be point out here. While leading analysts and economists are analyzing the reasons for failure in the financial sector and whereas almost everywhere in the world countries are facing with different negative trends in their economy, insurance industry in B&H recorded a further growth of premiums in 2010. Only a few countries in the world succeed to obtain and/or sustain positive trends of growth. This would mean that financial and economic crisis had not left any serious or significant adverse effects on the insurance sector in B&H. The reasons for this can be found mainly in underdevelopment of capital market in B&H and low volume of trading, on one side, and domination of the mandatory type of insurance (motor third party liability accounts a share of almost 50%) in the overall structure of insurance premiums, on the other side.

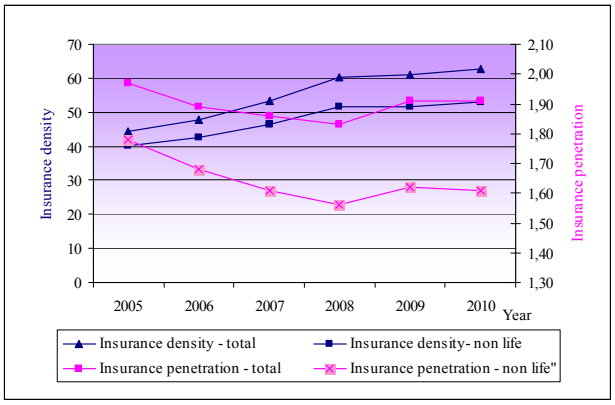
Table 1 Key indicators of insurance industry in BiH

Year	2005	2006	2007	2008	2009	2010
No. of companies	26	25	26	27	27	26
GWP (in mil. EUR)	170	184	205	231	234	241
Growth of GWP (%)	12.4	7.9	11.5	12.7	1.2	2.9
Motor liability (%)	56.5	54.9	52.1	49.2	49.3	48.8
% of life share in GWP	9.6	11.1	13.6	14.6	15.1	15.8

Source: Statistics of Insurance Market in B&H

Regardless of growing tendency of GWP, the insurance industry in B&H is still undeveloped. This can be corroborated not only by the low share of life insurance premiums in total GWR (which was a little bit below 16% in 2010), but also by the low value of two main insurance industry development indicators: *1) insurance density rate* i.e. gross written premium per capita and *2) insurance penetration rate* i.e. gross written premium as a percentage of GDP. Changes of these indicators during the 2005-2010 period are presented by Figure 1.

Fig.1 Insurance density and penetration in B&H



Source: Statistics of Insurance Market in B&H

From Figure 1 it is clear that *insurance penetration rate* gradually declined until 2008 after which it began to grow. During the entire period under observation its value was around 1.9 for total and 1.6 for non life segment. On the other side, *insurance density rate* was continuously growing and in 2010 it achieved the value of 63 EUR for total and 53 EUR for non-life insurance. However, the values of these indicators are still far below the average of European countries. For example, in EU 27 density rate was 2241 EUR for total and 859 EUR for non-life insurance, while the value of penetration rate for total and non-life insurance was 8.43 and 3.17 respectively [7,17]. Values of key development indicators for some other countries can be found in table 2.

Table 2 Key indicators of insurance industry in some other countries in 2010

Country	GWP total (in mil. EUR)	GWP non life (in mil. EUR)	Density rate (in EUR)	Penetration rate
Germany	181 026	94 318	2 192	7.1
Denmark	22 230	7 883	3 838	9.1
Poland	13 408	6 632	351	3.7
Czech Republic	5 974	3 185	568	4.0

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Slovenia	2 095	1 439	1 021	5.9
Croatia	1 270	932	286	2.8

Source: Sigma, Swiss Re

Given the level of insurance development in other European countries, it is clear that B&H is trailed far behind EU countries. Such a low level of development of insurance industry in B&H is closely connected with the problems that burden this country at macro and micro levels. Some of the main problems are: existing state constitution (as explained earlier), political system that has great influence on the insurance industry, slow process of privatization and economic reforms, poor macroeconomic indicators, low standard of living and purchasing power, insufficient financial strength of insurance companies and small variety of products, disloyal competition, inadequate prevention and sanctioning of deception in insurance, etc.

However, during the last few years both economy and insurance industry have made significant progress. This progress has also reflected on the insurers' profitability.

Fig.2 Average profitability of insurers in B&H

As it can be seen from Figure 2, in 2008 insurance companies achieved the lowest level of profitability meaning that economic crises left its mark on the insurers' performance. However, upward trend of profitability after 2008 indicates that the insurance companies managed to withstand the crisis and continue to operate successfully.

3 Literature review

Although determinants of profitability have been extensively studied in manufacturing sector (see for example: Ito et al. (2010), Seelanatha (2011); Papadogonas (2007), [8,15,12]) and, to a certain extent, in the context of banking institutions (Athanasoglous et al. (2008); Ramlall (2009) [1,14]) no such exhaustive empirical work can be found for the insurance industry in general and especially in Central and Eastern European (CEE) countries. In order to get insight into the previous research, some of the relevant studies together with their main results will be presented in the following paragraphs.

Chidambaran et al. (1997) analyzed the economic performance of the U.S. property-liability insurance industry and they found that the concentration ratio for the line and the share of direct writers in the line are both significant determinants of performance [4]. Shiu, Y. (2004) sought to identify the determinants of the performance of UK general insurance companies. The author used three performances measures (investment yield, percentage change in shareholders' funds and return on shareholders' funds) and revealed that liquidity, unexpected inflation, interest rate level and underwriting profits were statistically significant determinants of the insurers' performance [16]. Hrechaniuk et al. (2007) examined the influence of the various financial activities in different years in the three countries (Spain, Lithuania and Ukraine) and their findings suggested a strong relationship between insurer's past performance, the growth of the written insurance premiums and insurer's performance in "old", "new" EU members and non-member countries [6].

The results of the conducted analysis in Poland Kozak (2011) indicated that the GDP growth, increases of the market share of foreign owned companies and the reduction in the share of motor insurance in the portfolio positively influenced on profitability of non-life insurance companies [9]. Ahmed et al. (2011) investigated the impact of firm specific characteristics on the performance of listed life Pakistan insurance companies. The results of OLS regression analysis indicated that size, risk and leverage are important determinants of the insurer's performance presented by ROA [2]. Pervan and Pavić Kramarić (2010) investigated insurance specific variables, industry-specific and macroeconomic variables as the determinants of the Croatian non-life insurance companies' profitability. The results suggested negative and significant influence of ownership, expense ratio and inflation, and positive and significant impact of past profitability [13]. Ćurak et. al (2011) considered both firm-specific (internal) and economic (external) characteristics that influenced on Croatian composite insurance companies. The results of the panel data analysis indicated that size, underwriting risk, inflation and equity returns had significant

impact on the insurers' ROA as a profitability measure [5].

4 Methodology and variables

In order to introduce a dynamic component into the model we wanted to estimate, a lagged dependent variable is set as an explanatory factor (see model 1). This implies that there is correlation between the regressors and the error term, making standard panel data estimators inconsistent. In order to bridge the problem we use generalized methods of moments (GMM) panel estimator developed for dynamic panel models by Arellano and Bond (1991). We employ two-step estimator on the following model:

$$\pi_{it} = \alpha + \delta\pi_{i,t-1} + \beta X_{it} + \varepsilon_{it} \qquad \varepsilon_{it} = \nu_i + u_{it} \qquad (1)$$

where π_{it} is the profitability of insurers i at time t, with i=1, . . .,N, t=1, . .., T; α is a constant term, $\pi_{i,t-1}$ is the one-period lagged profitability, δ is the speed of adjustment to equilibrium, β is the vector of coefficients to be estimated, X_{it} is a set of the explanatory variables, ε_{it} is the disturbance, with ν_i the unobserved insurance-specific effect and u_{it} the idiosyncratic error.

All variables used in the analysis are chosen on the basis of relevant theory and literature. Beside of the theoretical considerations, the choice of explanatory variables is based upon the availability of data that are drawn from various issues of *Statistics of Insurance Market in Bosnia and Herzegovina* published by Insurance Agency of B&H [7]. The description of the chosen variables (i.e. ROE, percentage of life GWP in total GWP, diversification, age, ownership, market share and percentage of paid claims) and their expected influence on the insurers' profitability is given in the following sections.

As a measure of insurer's performance (dependent variable), we employ one of the most commonly used measures of profitability i.e. return on equity (ROE). This variable represents relationship between profit or loss of the accounting period after taxation and equity (subscribed capital, premium on shares issued, revaluation reserves, reserves and accumulated profit or loss).

Since our sample consisted of both, non-life and composite insurance company, in order to separate between them, a control variable *percentage of life GWP in total GWP* (i.e. L/T GWP) is introduced into the model (1). No theory predicts greater profitability of composite insurance company over non life insurance company (or vice versa) and therefore we do not anticipate a sign of this variable.

Several economic-based arguments support a linkage between profitability of the company and its *diversification*. As stated by Besanko et al (2011) benefits of company diversification are commonly associated with economies of scope, larger internal capital markets, risk reduction and greater market power [3]. Specific assets such as a distribution system, reputation and customer loyalty may also provide rationale to diversify since their transfer to another business can generate revenue economies of scope. On the basis of the presented arguments, a positive impact of this variable on the insurer's profitability is expected. However, if the costs arising from the diversification exceed the benefits, than a negative sign of this variable is anticipated. As a measure for insurer's diversification (HHD), a variation of the Herfindahl Index is used and HHD is calculated as a sum of the squares of an insurer's premiums written on each particular product line.

With respect to the impact of *company's age* on its profitability, the theory is equivocal. One stream of research argues that age could help companies become more efficient. Learning can occur as a by-product of day-to-day activities. Beside the benefits of learning, older companies have more experience, abilities and skills. Another stream of research, however, suggests that old age may also make knowledge, abilities, and skills obsolete. Older companies are prone to inertia and the bureaucratic ossification that goes along with age; they are unlikely to have the flexibility to make rapid adjustments to changing circumstances [11] and thus are likely to be outperformed by younger, more flexible companies. Therefore, influence of this variable on profitability is ambiguous (can be either positive or negative). Age of the company is measured by the number of years that company operate in the market.

Foreign insurance companies usually have superior technology and other resources, which make them more efficient and therefore more profitable than domestically owned companies. However, it is possible that domestic enterprises have well established distribution systems and are more familiar with the situation on the local markets and market opportunities, and to do business more profitable than foreign-owned firms. Bearing in mind the above, one can expect either positive or negative impact of ownership variables on the performance of the company. *Ownership* (OWN) variable is expressed as a percentage of domestic ownership.

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Market share (MS) shows the extent of a company's control over insurance industry and it indicates insurer's position in the industry. Lots of academics agree that the market share is often positively associated with the company's profitability. Reasons for that can be found in: economies of scale & scope and resulted cost advantage; large firms have more capital (internally generated or easily accessed from external sources) and be more innovative than their smaller competitors. Larger firms may also have greater bargaining power. In this study market share represents the ratio of an insurer's GWP to total GWP. Here we predict a positive influence of MS variable on the insurer's profitability.

Higher value of any costs (including claims paid) directly affect the amount of profit earned. Therefore, insurer will be in a better position and higher profits will be realized when its costs are lower. Since inverse relationship exists between claims paid and profitability measure, negative sign of this variable is expected. Variable *percentage of paid claims (%CP)* is calculated as a ratio of the number of the claims paid and number of reported claims multiplied by 100.

5 Empirical results

Our analysis included all non life and composite insurance companies that were active in B&H insurance industry during the 2005-2010 period. However, two companies (Hercegovina and Krajina Kopaonik) were eliminated from our analysis due to the continuous (negative) results expressed in terms of profitability. Descriptive statistics for each variable included in the analysis are presented in Table 3, while the results of the dynamic panel analysis are reported in Table 4.

Table 3 Descriptive statistics

Variable	Obs	Mean	Std.Dev	Min	Max
ROE	137	6.611	12.27	-61.5	36.02
L/T GWP	137	16.44	32.52	0	100
HHD	128	0.579	0.233	0.242	1
AGE	137	10.80	5.023	0	20
OWN	136	63.25	42.78	0	100
MS	137	4.195	3.115	0.016	14.61
%CP	113	78.49	14.56	0	94.46

Source: Authors` calculations

As it can be seen from Table 4, there is no presence of first-order or second-order autocorrelation (insignificant p-value of m_1 and m_2 test), while Sargan test shows no evidence of overidentifying restrictions.

Table 4 Determinants of profitability-parameter estimates

Explanatory variables	Coefficients	P
ROE_{t-1}	0.4825	0,005
L/T GWP	-0.8367	0,045
HHD	4.9539	0,419
AGE	3.5999	0,008
OWN	-1.6727	0,001
MS	8.4765	0,016
%CP	-0.1769	0,056
Constant	-2.9277	0,053
No. of obs	82	
Sargan test (p-value)	0,9460	
m_1 test (p-value)	0,1797	
m_2 test (p-value)	0,4212	

Source: Authors` calculations

The significant value of the lagged profitability variable (ROE_{t-1}) confirms the dynamic character of the model specification. Furthermore, we obtain a negative and statistically significant influence of variable *percentage of life GWP in total GWP* on company's profitability. A reason for that can be found in a fact that life insurance market in B&H has just begun with its development (e.g. in 2010 life *insurance density rate* achieved the value of only 10 EUR), and in this early stage of development companies have a significant acquisition costs (costs of selling life insurance products). Since the initial life premiums are used to settle the selling costs, one can expect the negative impact of life insurance premiums in total insurance premiums on profitability. A positive and significant influence of variable *Age* on profitability implies that during the time companies become more efficient. Beside the benefits of learning, older companies have more experience, abilities and skills. They also had enough time to build a good reputation and brand loyalty and can, therefore, enjoy superior performance. A negative sign of variable *ownership* suggests that foreign insurance companies may have better knowledge and greater experience that enable them to perform better than their domestically owned counterparts who are confronted with a lack of academic and professionally educated staff. Furthermore, the coefficient of the *Market share* (MS) variable is positive and significant, suggesting that large insurers are likely to perform better than small

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insurers because they can achieve economies of scale (cost efficiencies through increasing output). Also, large companies achieve declining costs in advertising and other promotional activities. Variable *percentage of paid claims (%CP)* has negative and statistically significant influence on insures' profitability. This is in accordance with the economic theory that points out inverse relationship between these two variables i.e. higher value of the *paid claims* directly reduce company's profit. Finally, according to the results, diversification does not play a significant role in determining the insurers' profitability in B&H.

6 Conclusion

This paper has reported dynamic panel estimations of a model designed to identify determinants of profitability in B&H insurance industry during the 2005-2010 period. The model was estimated by using the first-differenced GMM estimator proposed by Arellano and Bond. The results of the empirical analysis revealed negative and significant influence of claims ratio on profitability; and significant positive influence of age, market share and past performance on current profitability. In addition, diversification had no significant role in determining the profitability, while foreign owned firms performed better than domestically owned.

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