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FINANCIAL AND NONFINANCIAL PERFORMANCE MEASUREMENTS IN INSURANCE COMPANIES

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Abstract

The aim of this paper is to determine the operational quality level of the insurance companies and other companies based on the selected financial and non-financial performance indicators, as well as to perform a comparative analysis of the selected performance indicators in terms of these business entities. Financial performance was analyzed based on the data provided by the Serbian Business Registers Agency database, while the analysis of the non-financial performance was based on the results of the survey conducted in 11 insurance companies and 36 other companies. The analysis of the achieved quality level in the mentioned companies and identification of differences between the insurance companies and the other companies, as well as identification of the independent variables that have the most significant effect on the differences between these two groups, were performed by implementing discriminant analysis, one-way ANOVA and the Mann-Whitney U test. The performed analyses have shown that the differences between the observed companies do not exist in respect of all non-financial performance indicators, or in respect of profitability. The average score of all non-financial performance indicators is 3.1218, and ranges from 2.77 to 3.6158, which points to the fact that companies in the Republic of Serbia are at the medium level of quality management system development. The difference between insurance companies and other companies exists at the level of efficiency ratio and liquidity ratio. An analysis of these financial performance indicators has also detected low levels of profitability of the observed business entities.

Key words: performance, profitability, efficiency, liquidity, costs, management, processes

МЕРЕЊЕФИНАНСИЈСКИХ И НЕФИНАНСИЈСКИХ ПЕРФОРМАНСИ ОСИГУРАВАЈУЋИХ ДРУШТАВА

Апстракт

Циљ рада је да се одреди ниво квалитета пословања осигуравајућих друштваи осталих предузећана основу одабраних финансијских и нефинансијских перфор-

манси као и да се изврши компаративна анализа одабраних перформанси између наведених привредних субјеката. Финансијске перформансе су испитиване на основу података преузетих из базе Агенције за привредне регистре Републике Србије док је анализа нефинансијских перформанси базирана на резултатима анкете спроведене код 11 осигуравача и 36 осталих предузећа. Анализа достигнутог нивоа квалитета предузећа и детектовање разлика између групе осигуравајућих друштава и осталих предузећа, као и издвајање независно променљивих које највише утичу на међугрупне разлике, извршено је применом дискриминационе анализе, једнофакторске ANOVE i Mann-Whitneyev-or U теста. Разлике између посматраних предузећа не постоје код свих нефинансијских перформанси, као ни код рентабилности. Просечна оцена свих нефинансијских перформанси је 3,1218 и креће се у интервалу од 2,77 до 3,6158. Најнижу просечну оцену има нефинансијска перформанса руковођење2, а највишу ресурси. Наведено значи да су предузећа у Републици Србији на средњем нивоу развоја система менаџмента квалитета. Разлика између осигуравача и осталих предузећа постоји у висини коефицијента економичности и ликвидности. Анализа наведених финансијских перформанси указује на низак ниво профитабилности посматраних привредних субјеката.

Кључне речи: перформансе, профитабилност, економичност, ликвидност, трошкови, руковођење, процеси

INTRODUCTION

Positive experience of developed countries confirms the fact that supporting the development of the most successful companies generates economic growth and development of a country, as well as the region. A good example is the development of clusters, where the state, by implementing direct and indirect measures, supports the development of the most successful companies, which in turn instigates the development of small and medium-sized enterprises (SMEs) and their business partners; therefore, in a very short period of time, due to this inductive effect, a particular region becomes the most developed region in the world (for more information on the role of the state in the development of SMEs and their importance, see Jovetić & Ilić, 2001). Thus, the development of SMEs is one of the important strategic goals in terms of the development of the underdeveloped countries and their respective regions.

Pluralism and interconnectedness of interests of the key stakeholders, the state, banks, insurance company management, etc. influence the setting up of the strategic management framework, in particular in terms of setting the goals and defining a set of performance measures to continuously manage the sustainable development of companies. Therefore, in order to enable a company to follow up on its results, it is necessary to develop a performance measurement system (PMS).

Recent research in this field underlines the need to identify the contribution of those activities that increase the value of the company; both financial and non-financial performance indicators are used for this

purpose. Introducing various strategically harmonized performance indicators (balanced scorecard) and improving organizational outcomes by increasing the quantum of available information relevant to decision-making facilitates managers' consistent strategic decision-making.

Traditional company efficiency measurement systems were outdated even two decades ago. The article "Chief Financial Officer" from 1995 supports this conclusion and it points out that 80% of large American companies want to change their performance measurement systems (Birchard, 1995). The effective and efficient performance measurement system enables the company to measure and monitor its performance in accordance with the defined strategy (Kudryavtsev & Grigoriev, 2011; Domanović, 2013; Đogić, 2009). Efficient performance measurement systems are undoubtedly an important condition for the survival of companies in the conditions of dynamic and highly turbulent modern environment.

The effect of quality management on improving performance quality is achieved through monitoring requests/recommendations defined by the ISO International Standards. Compliance with these standards ensures the meeting of the all stakeholders' needs (Bryden & Dherent, 2011, p. 98; Jovetić, 2011; Simić & Baćević, 2010, p. 29).

Considering the needs of enterprises for more precise insight into their business results, Franco-Santos and Bourne (2005, p. 114) deal with the development of Business Performance Measurement (BPM) systems. Bourne (2005, p. 101) notes that the commitment of the top management is a key factor in positive output. Jovetić points out that the optimal balance between the financial performance indicators (FPIs) and non-financial performance indicators (NFPIs) should be made in accordance with the company's specific operations, in order to accurately determine the quality level of the organization and its individual functions, as well as to facilitate the positioning of the organization on its growth and development path (Jovetić, 2005, p. 131). Certainly, any improvement of FPIs and NFPIs is closely linked to continuous improvement of quality management systems. Therefore, it is necessary to constantly monitor the relationship between the investment performance and performance measurement on the one hand, and quality improvement on the other hand (Anđelković-Pešić, 2011, p. 35). Quality management in an organization involves meeting the requirements and principles of a quality management system, as well as drafting and keeping the required documentation, which verifies and ensures effective and efficient process/system management (Jovetić, 2011, p. 10). Oakland states that it is necessary to interconnect three important elements of each system; these are: good management systems, statistical process control, and teamwork (Oakland, 2003). The basic idea behind the implementation of quality management principles (ISO 9000, pp. 40-43) is the transformation of the organization from the

functional business orientation to the process orientation. Organization is a network of processes. Measuring the performance improvement is no longer based solely on FPIs, but rather on quality management, where the output means the ability of the process to meet the needs of the customers/stakeholders. The implementation of the systematic approach to management results in achieving specific goals and meeting the stakeholders' requirements in a balanced way (Ivanović, 2009). (For more information on monitoring methodologies and process performance improvement, see: Jovetić, 2007, pp. 91-103)

The latest revision of the ISO 9004:2009 standard "Managing for the sustained success of an organization – A Quality Management Approach" by all means contributes to the achievement of the abovementioned concepts and ideas. This standard provides guidance to an organization to support the achievement of sustained success in a complex, demanding, and changing environment by implementing the quality management approach. In addition, ISO 9004:2009 provides guidance for improving the overall performance of the organization (Jovetić, 2011, p. 9). Key performance indicators are crucial indicators of business performance – they are "…factors that are within the control of the organization and critical to its sustained success" (ISO 9004: 2009, p. 18).

Wu and Chen (2011, p. 869) conducted a survey in the companies that both applied and did not apply ISO standards, in order to determine the impact of ISO standards on the FPIs. The study was conducted in 285 manufacturing companies that implemented certified quality management systems, i.e. ISO standards, and 125 companies that did not implement these standards. The findings, according to the authors, suggest that implementation of ISO standards had a significant and positive impact on the performance of manufacturing companies, which all had higher growth potential in all lines of business.

Another study, which included 281 manufacturing and service companies operating in Australia, indicates that the implementation of ISO standards in companies positively affects business processes and operations. The authors concluded that in companies characterized by high or low FPIs implementation of the mentioned standards is associated with functional structure of business operations (Naira & Prajogo, 2009, p. 45).

Efficient functioning of financial intermediaries such as insurance companies, banks, pension funds, etc. is crucial to creating a sound and efficient financial system (Harker & Zenios, 2000). Therefore, this topic is very important, particularly the role of insurance companies. The development of both FPIs and NFPIs is critical for insurance companies as financial institutions that deal with specific tasks and in which risk assessment plays a major role. The National Bank of Serbia (NBS) defined a set of criteria for quantitative monitoring and analysis of financial stability of insurance companies in accordance with the methodology

prescribed by the International Monetary Fund – CARMEL indicators. CARMEL indicators include six groups of quantifiers: 1) capital adequacy, 2) asset quality, 3) reinsurance and actuarial issues, 4) management soundness, 5) earnings and profitability, and 6) liquidity, which can all be further disaggregated into their respective subgroups.

The analysis of CARMEL indicators shows that numerous financial indicators are used to measure efficiency of the ICs' operations; however, the most important of these are analyses of Liquidity, Profitability, and Efficiency. ICs must give special attention to the analysis of financial statements as the primary source of information for determining the efficiency of operations, avoiding insolvency risk and securing the market position.

This research focuses on the data on FPIs and NFPIs provided by 47 companies. The aim of this paper is to measure the selected FPIs and NFPIs of General Insurance companies and other surveyed companies (OCs) in order to determine their achieved level of business operations quality, as well as the differences in their development level.

Pursuant to the presented research subject and goal, the paper defines and, by using appropriate instruments, tests the general hypothesis H_{10}: There are no differences in the average scores of non-financial performance indicators in insurance companies and other companies, or regarding the value of average financial performance ratios.

RESEARCH METHODOLOGY

Selection of a Set, Subsets, Samples, and Their Description

The population includes business entities operating in the Republic of Serbia (RS), which are divided into two subsets: insurance companies (ICs) and other companies (OCs). A survey was conducted in 11 ICs and 36 OCs, i.e. 7 banks, 3 ICT companies, 14 manufacturing companies, and 12 companies from other economic sectors. Concerning the 11 ICs, two ICs were founded by domestic capital, while the other nine are in foreign ownership.

In our statistical model the dependent variable is Company type; thus, in this case there are two distinct company types: 1-OCs and 2-ICs. Independent variables in the model are the following FPIs: Profitability, Efficiency and Liquidity. Profitability is calculated as the ratio of net income to total revenue and is expressed as a percentage. It shows earnings on every 100 RSD invested. Efficiency is calculated as the ratio of total revenues to total costs, and it shows how much is earned on 1 RSD of total costs. Liquidity is calculated as the ratio between liquid assets and liabilities (Lukić, 2006, p.77).

Data for the calculation of the selected FPIs were taken from the profit and loss accounts provided by the Serbian Business Registers

Agency (SBRA) and were deflated according to the middle exchange rate of the Euro, applicable on December 31 of the relevant year (NBS).

Information on NFP indicators was collected on the basis of the ISO 9004 standard questionnaire (Annex B). The first part of the survey relates to the assessment of key performance indicators: management1; management2; strategies and policies; resources; processes; monitoring and measurement1; monitoring and measurement2; improvement, innovation, and learning1; and improvement, innovation, and learning2. The survey was anonymous. A number of employees in companies were surveyed (a total of 150 respondents), and, based on the answers received, the average score for each key performance indicator was calculated. The survey was conducted from April to September 2014. The surveys were completed by one manager and one or more employees. The respondents could choose among the answers offered, grouped into five levels, determining the level of quality of the performance indicator. In accordance with the abovementioned measuring instrument, the following scale for scoring the responses was used: 1 (the lowest level) to 5 (the highest level). The total number of points that an organization could score was 45, and the lowest 9.

For each listed NFPI in the survey there is one question. For NFPI Management 1 the question is: "What is the management focus?" and for Management 2: "What is the leadership approach?" As regards Strategy & Policy the question is: "How is it decided what is important?" The question concerning Resources asks: "What is needed to get results?" In terms of Processes the question is: "How are the activities organized?" The question for Monitoring and Measurement 1 is: "How are the results achieved?" and for Monitoring and Measurement 2: "How are results monitored?" Regarding Improvement, Innovation, and Learning 1, the survey asks: "How are improvement priorities decided?" while the Improvement, Innovation, and Learning 2 question is: "How does learning occur?"

Data on the NFPIs were collected based on the self-assessment tool, which is an integral part of the ISO 9004 International standard. The first section of the self-assessment tool pertains to the assessment of the key elements, while its second section focuses on detailed self-assessment of each item listed in the mentioned standard. Respondents who are the employees of the surveyed companies filled out only the first section of the self-assessment tool. The survey was anonymous. A large number of respondents (150 people) took part in the survey, and based on their answers, the average score for each key element was calculated. The survey was conducted from April to September 2014. The surveys were filled out by one manager and one or more employees per company. Respondents chose one of the alternatives offered; the answers were grouped into five levels each corresponding to the respective quality and performance level. In accordance with the abovementioned measuring

instrument, the following measurement scale was used: 1 (the lowest level) to 5 (the highest level). A maximum score that a company can achieve is 45 and the lowest 9.

Statistical-econometric Methodology

Collected statistical data were analyzed by use of the following methods:

- Statistical description of data: distributions of absolute and relative frequencies were determined; arithmetic means, variance, standard deviations were calculated for each performance indicator and for each sample;
- Statistical analysis included the following: discriminant analysis, one-way analysis of variance (ANOVA) and Mann–Whitney U test. In addition, Pearson's correlation coefficients were calculated and their statistical significance was tested.

Discriminant analysis, as a suitable statistical instrument for the defined points in question, t-test, and the Mann-Whitney U test were used to identify the differences between the two defined groups: the ICs group and the OCs group, as well as to carry out the selection of independent variables that most significantly affect these differences.

Discriminant analysis is based on the specification of a discrimination function as a linear combination of independent variables, which makes a statistically significant separation of observations between defined groups. Hence, this analysis should be used in those cases when differences between groups that have a large number of variables are tested (more on discriminant analysis can be found in Tabachnick & Fidell, 2013, pp. 419-480). In our case, we tested the differences between 9 non-financial and three financial performance indicators. The conditions for the application of discriminant analysis are: multivariate normality; existence of a linear relationship between pairs of independent variables within a group; homogeneity of variance and covariance; absence of multicollinearity between independent variables and meeting of the requirement that each independent variable must be normally distributed. As a number of independent variables in the study could be approximated by a normal distribution, the results of discriminant analysis were tested by use of the t-test, which compared the arithmetic mean of the performance indicators of the two groups of companies (for more, see Jovetić S., 2007, pp. 281-286). For the independent variables that could not be approximated by a normal distribution, and considering that in the sample of IC the number of observations was $n = 11 < 30$, the testing of the results of the discriminant analysis relied on the use of the Mann-Whitney non-parametric test (for more, see Tabachnick & Fidel, 2011, p. 427).

In terms of discriminant analysis, the assumptions are as follows:

- P_{10}: Discriminant function is not statistically significant,
- P_{20}: There are no differences between the groups based on the values of the independent variables,
- P_{30}: The independent variables that affect the differences between groups the most cannot be isolated,
- P_{40}: All elementary units, OCs/ICs, are *a priori* and *a posteriori* classified into groups in exactly the same manner.

The application of discriminant analysis required the fulfillment of the following specific assumptions:

- Each independent variable can be approximated by a normal distribution,
- The assumption of multivariate normality is confirmed, i.e. independent variables in the sample do not show any atypical or extreme values,
- Sample data show no multicollinearity nor singularity,
- There is no linear relationship between the pairs of independent variables.

The data on surveyed companies are stored in IBM SPSS Statistics 19 and Microsoft Excel 2007 databases. IBM SPSS Statistics 19 and Microsoft Excel 2007 software were also used for data processing. Confidence levels of $\alpha = 0.001$, $\alpha = 0.01$, and $\alpha = 0.05$ were used to determine statistical significance.

RESULTS AND DISCUSSION

Analysis of the Performance Indicators

In the initial analysis, the ICs and the OCs were grouped according to their profitability ratios. Eight out of eleven surveyed ICs earned profit, i.e. were profitable, while three companies recorded losses in 2013. Data on OCs showed that 13 surveyed companies had operating losses, i.e. they had negative profitability ratios, while the rest of the OCs had profitability ratio up to 1 (Source: SBRA).

Next, the analysis of the ICs was extended by calculating the rate of change in the profitability ratio in the period from 2010 to 2013. The mean value of profitability ratio is in the range between -1.2645 (AXA General Insurance) to 0.0526 (Generali Insurance Serbia). A detailed analysis of the arithmetic means of the profitability ratio identified 6 ICs with negative values; 2 ICs had profitability ratios close to 0, while the remaining 3 ICs had a positive, yet extremely low profitability ratio (*Source*: SBRA and NBS).

We subsequently analyzed chain indices that track the percentage of increase or decrease in total revenues and total expenditure in consecutive, annual periods. Average rate of change concerning the analyzed categories

was calculated based on the values of these indices, so the ICs were divided into three groups. In the first group positive revenue growth rate is higher than the positive growth rate of expenditure (2 ICs). This results in positive business performance. The second group includes 4 ICs, where positive rate of revenue change is smaller than positive rate of expenditure increase. The third group includes 4 ICs which have negative rates of change in revenues and expenditure and in this group only Sava IC recorded a higher rate of decrease in expenditure than the rate of revenue decline. According to the stated facts, the third group also has a negative rate of return.

ICs and OCs were also grouped according to their efficiency. Based on the data from 2013, the efficiency of 3 ICs is smaller than 1, and with as many as 10 insurers the efficiency ranges from 0.43 to 1.04 RSD, which means that all ICs have the efficiency of up to 1.31. (*Source*: APR).

Further analysis of the efficiency was conducted by calculating the average rate of return of the analyzed ICs in the period from 2010 to 2013. Based on the average rates of return it can be noted that those ICs whose rate of return recorded a decline also had a lower rate of return – smaller than 1 (*Source*: SBRA and NBS).

Results of the classification of the analyzed ICs and OCs, as well as the analysis of the aforementioned Liquidity indicator for 2013, showed that liquidity of most ICs was in the range from 2.39 to 9.91. Triglav IC had the lowest liquidity, while Takovo Osiguranje IC had the highest one (17.25). Out of 36 ICs, 33 had liquidity in the interval up to 2, and liquidity of the remaining 3 companies was in the following interval (*Source*: SBRA).

The ICs and the OCs were grouped based on the NFPIs. In terms of these indicators, the ICs had the total average score of 3.18 and the OCs of 3.10. Average scores per key elements are: Management 1 – 2.73, Management 2 – 2.71, Strategy & Policy – 2.91, Resources – 3.75 Processes – 3.07, Monitoring and Measurement 1 – 3.25, Monitoring and Measurement 2 – 3.63, Improvement and Innovation 1 – 3.00, and Improvement and Innovation 2 – 3.57. Differences between the ICs and the OCs were only found in the answers concerning the following questions: "How are results monitored?" and "How does learning occur?" Average scores of the OCs were one level lower than those of the ICs.

Testing the Assumptions of the Discriminant Analysis

In order to apply discriminant analysis, it is necessary to test if all conditions for its implementation have been met. The first step is to test the hypothesis whether each independent variable can be approximated by a normal distribution. By applying the Shapiro-Wilk test, we found that the following variables could not be approximated by a normal distribution ($p \leq \alpha$): Management2, Resources, Processes, Monitoring and

Measurement2, Improvement, Innovation, and Learning1, Profitability, and Liquidity. The remaining variables could be approximated by a normal distribution: management1, strategies and policies, improvement, innovation and learning2, and efficiency. At the level of test significance $\alpha = 0.01$, the variable Monitoring and Measurement could also be approximated by a normal distribution. However, as the number of observations in the sample is 47, i.e. greater than 30, this means that each empirical distribution, according to the central limit theorem, tends to normal; therefore, in the performed analysis, all variables could be approximated by normal distribution.

In the second step, the assumption on multivariate normality is assessed by applying the Mahalanobis distance. Each elementary unit gets a certain value of the Mahalanobis variable, in proportion to the degree of the diversity of its combination of results from the results for the rest of the sample. In the case of the observed companies, maximum Mahalanobis distance is 32.188, while the critical value is $\chi^2_{12;0.001} = 34.909$; therefore, at the $\alpha = 0.001$ level of significance (Pailant, 2011, p. 289) the requirement of multivariate normality has been met and hypothesis H_{60} is accepted.

In the third step, we tested for the multicollinearity between the variables. Multicollinearity was tested using the variance inflation factor, $VIF = 1 / (1-R^2)$, where R^2 is the coefficient of determination between the independent variables. If $VIF \geq 10$, then there is a high degree of multicollinearity between the independent variables. Since VIF ranges from 2.198 (for the independent variable Profitability) to 4.064 (for the independent variable Improvement, Innovation, and Learning 2), we conclude that there is no multicollinearity between the independent variables; therefore, the null hypothesis H_{70} is accepted. In terms of the conducted survey, there is not a single independent variable that consists of other independent variables, so the condition concerning non-singularity of the data has been met.

Accordingly, it can be concluded that the conditions for the application of the discriminant function analysis have been met.

The Application of the Discriminant Function Analysis

In terms of discriminant analysis, the statistics of the samples were first established, i.e. the arithmetic means and standard deviations of the NFPIs and the FPIs scores were calculated for the ICs (group I) and the OCs (group II), as well as respective total values. Table 1 shows the results of the testing regarding the hypothesis on equality of arithmetic means between variables in both groups by applying one-way ANOVA, that is, the Wilks' lambda statistics, Snedecor's F distribution and the statistical significance of F-statistics.

Table 1. Testing the equality of the groups' means
One-way ANOVA

PIs	Wilks' lambda	F	df1	df2	Significance
Management 1	.988	.524	1	45	.473
Management 2	.999	.059	1	45	.810
Strategy & Policy	.988	.566	1	45	.456
Resources	.996	.174	1	45	.679
Processes	.997	.149	1	45	.701
Measurement and Monitoring 1	.995	.235	1	45	.630
Measurement and Monitoring 2	.938	2.994	1	45	.090
Improvement, Innovation, and Learning 1	1.000	.017	1	45	.896
Improvement, Innovation, and Learning 2	.956	2.054	1	45	.159
Profitability	.976	1.126	1	45	.294
Efficiency	.699	19.415	1	45	.000
Liquidity	.404	66.309	1	45	.000

*alternative hypothesis is accepted
Source: Authors' processing of own data

In all cases of testing the hypotheses of equality of the average scores of NFP indicators, the general hypothesis H_{10} is accepted (significance $p > 0,05$), i.e. there is no difference in the average scores of NFP indicators in the observed groups. In respect of FP indicators, the null hypothesis H_{10} is accepted for profitability, and the alternative for efficiency and liquidity ($p < \alpha$), i.e. there is a difference in the average efficiency and profitability between the ICs and the OCs.

Next, the stepwise regression was applied. This method allowed us to select and gradually include in the model, at each step of the analysis, those variables that have the greatest effect on the dependent variable.

In the last step of the analysis, all variables remaining in the model must have the F-statistics greater than the lower critical value (2.71), while all variables that are outside the model must be below the critical value (3.84).

Stepwise regression results are given in Table 2. Variables Liquidity and Efficiency remained in the model since their Snedekor's F statistic values are larger than the critical value of 3.74, so these two independent variables have the greatest effect on intergroup differences (the same conclusion is supported by the data given in Table 1).

Table 2 Variables in the model

	Step	Tolerance	F- statistics	Wilks' lambda
1	Liquidity	1.000	66.309	
2	Liquidity	1.000	46.156	.699
	Efficiency	1.000	8.174	.404

Source: Authors' processing of own data

The canonical correlation coefficient determines the correlation between the discrimination function and the categorical variable ICs and OCs, while the eigenvalue refers to the ratio between the sum of the squared deviations between the groups and the sum of squared deviations within a group, i.e. eigenvalue = $CanR^2/(1\text{-}CanR^2)$, where $CanR^2$ stands for squared canonical correlation coefficient. In the case of companies surveyed (Table 3), squared canonical correlation coefficient shows that 65.9344% of the variance of the dependent variable Company Type is explained by discriminant model that justifies the use of discriminant analysis.

Table 3 Eigenvalue and canonical correlation coefficient

Function	Eigenvalue	% variance	Cumulative %	Canonical correlation
1	1.933	100.0	100.0	.812

Source: Authors' processing of own data

The hypothesis on the statistical significance of the discriminant function is tested by Wilks' lambda statistics, Chi-Square test and the statistical significance of the Chi-Square test. Wilks' lambda statistic is equal to the ratio of the variability within the group to the total variability, i.e. the proportion of the total variance of discriminant variables which cannot be explained by intergroup differences regarding the total variance. The greater value of discriminant function is in correlation with the lower Wilks' lambda value.

In our case, Table 4 shows that Wilks' lambda statistics is 0.341; χ^2 = 47.346 and p = 0.000<α, which supports the alternative hypothesis H_{11}, which assumes that discriminant function is statistically significant, i.e. differences in average values of the discriminant variables from mentioned two groups are statistically significant. Discriminant function identifies the distinction between ICs and OCs in terms of arithmetic means (AM) of profitability coefficient (OCs: AM = 0.594222 and standard deviation (SD) 1.601032; ICs: AM = 0.626549 and SD = 2.3938374) and liquidity coefficient (OCs: AM = 1.315355 and SD = 0.9594573; ICs: AM = 7.645018 and SD = 5.0135012). The same conclusion is drawn based on the results of the ANOVA testing for the equality of means between the groups (Table 1).

A structural matrix that shows discriminant weights for each independent variable is also obtained as a result of discriminant analysis. Discriminant weights are correlations between independent variables and discriminant functions. Greater value of discriminant weights in the structural matrix indicates that independent variables Liquidity (0.873) and Efficiency (0.472), which remained in the model, have greater effect on the discriminant function, i.e. the classification of the population into groups.

Table 4 Wilks' lambda, Chi-Square test, and Chi-Square test significance

Test of the function (a)	Wilks' lambda statistics	Chi-Square significance	Degrees of freedom df	Statistical significance p
1	0.341	47.346	2	0.000

Source: Authors' processing of own data

With discriminant analysis, series of values of discriminant variables are calculated by replacing observations in the discriminant function. Based on the characteristics of each elementary unit, its similarities and dissimilarities (Mahalanobis distance) related to the center of the group (multivariate mean) are calculated and, based on these calculations, a new classification is suggested – *a posteriori* classification. Hit ratio represents the percentage of optimal classification of observations (*a posteriori*) into groups by use of discriminant model (Table 5). Hit ratio is expressed in percentage and for the observed sample it is *93.6%* (indicated under the table given below), which means that 93.6% of companies were classified into two groups in the same manner as in the selected sample.

Table 5 Classification of elementary units

	Groups	1.00	2.00	Total
Number	1.00	36	1	36
	2.00	2	9	11
%	1.00	97.2	2.8	100.0
	2.00	27.3	81.8	100.0

a) 93.6% of original grouped cases correctly classified
Source: Authors' processing of own data

T-test for Testing the Assumption on the Equality of Arithmetic Mean

The first step in SPSS is to test the assumption of equality of group variances by using Levene's test. Snedekor's F statistics and its statistical significance are used (Table 6: columns 1 and 2). Since $p(F)>0.05$, it can be concluded that, in the subsets from which the two samples have been selected, the variances are the same.

The second step is to test the assumption of the equality of arithmetic means, based on the Student's t-test, using t-statistics and its statistical significance. Since only in respect of the variable efficiency $p(t)<0.05$, we conclude that there are statistically significant differences in arithmetic means of subsets from which the samples have been selected. The same conclusion is drawn using the discriminant analysis.

Table 6 The statistics of t-test

	Levene's test		t-test				
	1	2	3	4	5	6	
PIs	F	Sig.	T	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Management 1	.632	.431	.724	.473	.2684	-.4785	1.0154
Strategy & Policy	2.871	.097	.753	.456	.2317	-.3884	.8517
Measurement and Monitoring 1	.132	.718	-.484	.630	-.1392	-.7179	.4395
Improvement, Innovation, and Learning 2	.160	.691	-1.433	.159	-.5194	-1.2495	.2106
Efficiency	1.923	.172	-4.406	.000	-.5050	-.7358	-.2741

Source: Authors' processing of own data

Mann-Whitney U (MW) test

For performance indicators, Management2, Resources, Processes, Monitoring and Measurement2, Improvement, Learning, and Innovation1, Profitability, and Liquidity, the basic assumption of parametric tests that they can be approximated by a normal distribution has not been fulfilled, and since the sample of the ICs is small ($n = 11 < 30$), although the same results were obtained by using the single-factor ANOVA and discriminant analysis, the Mann-Whitney non-parametric test was applied for those variables. Assumptions of the MW non-parametric test are the randomness of the sample and independence of observations.

The application of MW-test shows that the median value for all NFP indicators is equal to 3, except for the variable Resources, whose median value is 3.6666; thus, at the level of test significance of $\alpha = 0.05$ for the above NFP indicators, it is accepted that there is no difference between the median value in respect of ICs and OCs, so these two samples belong to the same population with the same median values ($p > \alpha = 0.05$). With a confidence level of 95% the same conclusion is also applied to FP profitability, while in respect of liquidity, at all levels of test significance, it cannot be considered that populations of ICs and OCs have the same median values ($z = -4.8$, $p = 0.000 < \alpha$). Median value for the variable Liquidity for ICs is 1.131125, and for OCs it is 6.6173. The difference level is $p_{lik} = |z| \sqrt{(n)} = 0.7001 > 0.5$, which, according to Cohen's criterion (Cohen, 1988, p. 22), is considered a big difference.

Furthermore, Pearson's correlation coefficients detected significant positive correlation between the Top Management's Focus and Approach to Leadership (correlation coefficient $R = 0.538$) and the Strategy & Policy and Decision Making ($R = 0.664$). Likewise, there is an important

correlation between the Approach to Leadership and Deciding on Improvement Priorities (0.532), as well as a positive correlation between the Strategy & Policy and Monitoring and Measurement 1 (0.524) and between the Strategy & Policy and Improvement, Innovation, and Learning 1 (0.604). Resource management is in significant correlation with the Manner in Which Learning Occurs (0.624), while the Organization of Activities is both in correlation with the Manner of Achieving Results (0.595) and the Manner in Which Learning Occurs (0.632). Achievement of results is in significant positive correlation with the Manner of Results Monitoring (0.601) and the Manner in Which Learning Occurs (0.532). The Manner in Which Learning Occurs is also significantly correlated with Deciding on Improvement Priorities (0.522).

In addition, statistically significant correlation coefficients are identified between the FPI Profitability and the following indicators: the NFPI Strategy & Policy (0.325), the NFPI the Manner in Which Learning Occurs (0.342) and the FPI Efficiency (0.627). FPI Efficiency is in a statistically significant correlation with Resources (0.336) and the Manner in Which Learning Occurs (0.387), as well as Profitability (0.627) and Liquidity (0.415). Liquidity is in statistically significant correlation only with Efficiency.

The average score of NFPIs in the ICs (3.17923) is slightly higher than the average score in the OCs (3.1042). Average scores of NFPIs range from 2.77 to 3.6158. The performance indicator Management 2 has the lowest average score, while the indicator Resources has the highest. Average scores for other NFPIs are close to 3. Based on the analysis of the average scores of the NFPIs, an average company in RS (both ICs and OCs) is characterized by the following: "Management is focused on people and some additional stakeholders. Processes are defined and implemented, approach to management is a proactive one and decision-making powers are delegated. Decision making is based on strategy related to the needs and expectations of the stakeholders. Resource management is effectively implemented in such a manner that it takes into account the insufficiency of individual resources. Activities are organized in line with the quality control system based on the application of all contemporary management principles, in particular the process approach that is not only effective and efficient, but also allows flexibility. The anticipated results are achieved, particularly concerning the identified stakeholders. There is a consistent use of monitoring, measurement, and improvement. Key performance indicators (i.e. key elements) are in line with the company's strategy and are used to monitor the satisfaction of the people employed with the company, as well as the stakeholders. Improvement priorities are based on the needs and expectations of some stakeholders, as well as providers and company's employees. The company encourages "learning as an organization" and "learning that integrates

capabilities of individuals with those of the organization principles thus supporting innovation and improvement through learning" (ISO 9004:2009, pp. 25-39). The average profitability coefficient is negative and is -0.475, while the average efficiency and liquidity ratios are 1.0477 and 2.7968 respectively.

CONCLUDING REMARKS

Identification of the statistically significant differences between the defined ICs and OCs groups was performed using: one-way ANOVA, discriminant analysis, t-test, and Mann-Whitney U (nonparametric) test. The results of all these analyses indicate that there is no difference between the ICs and the OCs in the average scores of the NFPIs, as well as in the average scores concerning FPI Profitability; however, there are differences between the ICs and the OCs in terms of the efficiency ratio (ICs 1.4345; OCs 0.9296) and the liquidity ratio (ICs 7.873; OCs 1.2458).

The research indicates a medium level of quality of NFPIs for all surveyed companies, while the quality level of their FPIs is extremely low; however FPIs are somewhat higher in the ICs than in the OCs.

Although certain government and other institutions (Development Fund of the Republic of Serbia, banks, the Stock Exchange) defined the criteria for the FPIs measurement in order to determine the creditworthiness of companies, it is essential that the government officially establish the system/methodology for placing companies on their development path and that it manage them.

In terms of defining the performance indicators of a system, an optimal balance should be achieved between the FPIs and the NFPIs. Accordingly, it must be taken into consideration that some room must be left for companies to include certain specific performance indicators characteristic for their line of business.

In the period from 2010 to 2013, we conducted a detailed analysis of the FPIs, especially Profitability as the measure of total revenue and total expenditure. We concluded that the profitability of the ICs can be improved by cutting the operating costs. Therefore, in order to have successful operations it is necessary to analyze the overall costs and their structure, identify the sources of cost generation, and define preventive and corrective measures to reduce them. It is particularly important to identify hidden costs – losses occurring due to non-compliance of processes, costs of (non)quality, as well as all other losses, and then implement appropriate measures to correct them. In order to establish a subsystem for managing these costs, i.e. in order to determine the structure, processes, procedures and guidelines, responsibilities and powers of employees, and provide the necessary resources, it is vital: to monitor and assess individual elements of costs, measure their effect on the sets of costs and total costs,

as well as to track the changes in the system's cost structure; to determine the optimum level of individual costs and their optimal structure for a defined period of time; to analyze costs and identify the sources of costs generation; to implement corrective actions for their reduction; and to track their trends, as well as their reduction over time. Furthermore, the establishment of a system for managing total operating costs will form the basis for increasing profitability of the insurers, which will boost the confidence of customers and thus the company's market share. Since Pearson's correlation coefficients detect statistically significant positive correlations between the pairs of variables, their synergistic effect should be considered when defining business policy measures.

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МЕРЕЊЕФИНАНСИЈСКИХ И НЕФИНАНСИЈСКИХ ПЕРФОРМАНСИ ОСИГУРАВАЈУЋИХ ДРУШТАВА

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Резиме

Дефицит платног биланса представља главни проблем са којим се сусреће српска привреда. То ствара притиске на пад вредности домаће валуте и инфлацију, што онемогућава постизање унутрашње и екстерне макроекономске равнотеже. Дефицит платног биланса се не може покривати додатним краткорочним задуживањем, јер је то неодрживо у условима високог јавног дуга. Такође, девизне резерве се користе само за краткорочну стабилизацију. Увозна зависност привреде (у услучају енергената и високо технолошких производа) јесте разлог зашто се пораст девизног курса брзо преноси на инфлацију преко трансмисионог механизма. У Србији позитивна корелација између нивоа девизног курса и извоза практично не постоји, тако да се девалвација националне валуте не може користити као средство за отклањање платнобилансне неравнотеже. Редуковање агрегатне тражње је од огромне важности за макроекономску стабилизацију. Међутим, због релативно ниске агрегатне тражње у Републици Србији, то би изазвало потпуни колапс привреде, па се као једина солуција за смањење дефицита платног биланса предлаже повећање извоза. Истраживање показује да је у условима немогућности повећања извоза у кратком року једино решење смањење јавне потрошње, како би се, између осталог, смањила тражња за увозом добара, док се инвестициона потрошња обично не сме смањивати јер је овај вид потрошње битан за привредни развој земље.

Извоз представља кључни генератор платнобилансне равнотеже, која преко стабилизације девизног курса делује на монетарну стабилност. Основни услов за повећање извоза, као стратешког циља за постизање стабилности цена и равнотеже платног биланса, јесте побољшање извозних перформанси Републике Србије, као и атрактивности у привлачењу страних директних инвестиција, пре свега у извозно оријентисаним секторима привреде Србије.

Повећање извоза остварује се разним подстицајним мерама које су разматране у овом истраживању. Подстицање инвестиција, неценовне конкурентности и повећање степена производне и географске диверзификације извоза јесу битни за унапређење извоза, као главног развојног импулса скоро сваке привреде. Јачање сектора малих и средњих предузећа доприноси повећању конкурентности извозне понуде Србије. Неповољна секторска и географска структура извоза, тј. висок степен концентрације извоза (око 60% извоза се пласира на тржиште Европске уније) мора се превазићи у наредном периоду путем географске диверзификације извоза. Извоз на растућа тржишта (Русија, Кина) захтева повећање техничке опремљености у земљи.

У условима високог буџетског дефицита доводи се у питање могућност давања разних фискалних подстицаја и бенефиција како би се подстакао извоз. Стимулисање извоза путем повећања девизног курса није могуће због лошег квалитета и недостатка сертификованих производа. Зато се као неки од циљева наводе повећање продуктивности, примена савремених метода управљања, коришћење модерних технологија, итд.