



Business Competitiveness, its Financial and Economic Parameters

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ABSTRACT

In the paper the following research problem was solved: Which method for the calculation of competitiveness is able to incorporate all areas of business financial health and performance to the measurement of competitiveness and to measure competitiveness exactly. In line with the research problem, the aim was determined. The aim of the paper was to evaluate business competitiveness. Research sample consisted of businesses operating in Slovak heat industry. It was a test sample of 343 businesses. To quantify the competitiveness of analysed sample of businesses, these competitiveness indicators were applied: Indicator $PP_1 = \text{Fast solvency} = (\text{Current capital}) / (\text{Short-term liabilities})$; Indicator $PP_2 = \text{Sales/Costs}$; Indicator $PP_3 = (\text{Gross Income}) / (\text{Short-term liabilities})$. In addition to these measures, we calculated EVA indicator, which represents comprehensive indicator of performance and competitiveness. To compare and identify the match of rankings, Spearman's rank correlation coefficient was applied. The important finding of this paper is that competitiveness of a business is determined by its financial health and performance. This study follows the authors' research, which is focused on the application of methods used to measure business competitiveness. The original approach to the assessment of competitiveness is the application of EVA indicator and confirmation that EVA indicator may be the criterion for evaluating the competitiveness of businesses. This methodology is beneficial when finding ways to improve performance, efficiency as well as competitiveness of a business.

INTRODUCTION

Competitiveness is nowadays a frequently used term that can be analysed at different levels - at the enterprise level or at the level of whole country. Despite the aim of the paper, which is the competitiveness of production systems, it is appropriate to pay attention to the competitiveness of the country in which these systems operate as well. Competitiveness at the macroeconomic level must always take into account microeconomic context. Even the best government policy is ineffective unless it is implemented in the context of a business sphere. The country's competitiveness can be assessed by Global Competitiveness Index, which outlines the perspective of a country to achieve sustainable economic growth in the medium term, evaluates the quality of public institu-

tions, government policies and other factors which determine the level of productivity and prosperity in different countries around the world. Slovakia scored 66.8 points out of 100 in the 2018 Global Competitiveness Report published by the World Economic Forum. Slovakia is the 41st most competitive country in the world out of 140 countries ranked in the 2018 edition of the report. Compared to previous year it is a move of two positions down. The period 2017-2018 marked an improvement in the position of Slovakia in 9 out of 12 pillars (index components), namely institutions, infrastructure, information and communication technology adoption, macroeconomic stability, health, skills, financial systems, market size and innovation capability. In other 3 pillars position of Slovakia, however, decreased (WEF, 2018). In 2017, Slovak entrepreneurs evaluated as the biggest problem of doing a business in Slovakia corruption, which gained almost 20% of votes, followed by the inefficient government bureaucracy, tax rates, tax regulation and restrictive labour regulations (WEF, 2017).

According to surveys, Slovak businesses have three ways of being competitive in the global competitive environment. Those include: wages reduction while achieving higher productivity; change in a ratio of capital and work; outsourcing intensive parts of the supply chain to low-cost regions in order to reduce total production costs. However, all these approaches are only short-term solutions to the issue. Many analysts and scientists have highlighted the potential of Slovakia to strengthen innovation capacities through investments in knowledge as a way of maintaining long-term competitiveness based on the ability of businesses to innovate and continuously learn (Slovak entrepreneurs identify innovation, flexibility and product quality as sources of competitiveness) (Kiselačková et al., 2018).

Based on this brief definition of the competitiveness of the Slovak Republic, the next part of the paper focuses on the competitiveness of selected Slovak businesses in more depth.

The paper is structured as follows: Section 1 features the literature review. This part of the article outlines different definitions of competitiveness. The aim of the paper and the research problem are formulated at the end of this section. Section 2 describes the research sample and applied methods. We applied methods that assess competitiveness in terms of profitability and liquidity ratios. We made use of a method by Foltyn (2000) and calculated the EVA indicator. Section 3 presents the results and discussion of the results achieved. We compared the outcomes of the application of Foltyn's methodology and EVA indicator with the use of Spearman's rank correlation coefficient. Based on this coefficient we assessed the match between the results of applied methods. The final part of the article is the conclusion in which the essential conclusions and benefits of the research were elaborated and outlined.

1. LITERATURE REVIEW

Despite widespread acceptance of the importance of competitiveness, researchers have failed to reach a consensus on the definition of this term (Flanagan et al., 2007). Therefore there is no precise, universally valid and generally accepted definition of the competitiveness in scientific literature and approaches to its definition are highly diverse (Hudakova, 2009). According to the European Community (1999, In: Charles and Zegarra, 2014), the concept of competitiveness is linked to the ability of businesses, industries, regions, nations and transnational regions to generate, while being exposed to international competition, relatively high income and employment levels. OECD defines competitiveness similarly - as the ability of companies, industries, regions, nations and transnational entities to generate relatively high levels of income from factors of production but also to use them at a sustainable level in the current competitive environment (Vida et al., 2009). According to Porter (1985) competitiveness is a function of a dynamic progressiveness, innovation and a capability to change and improve. The summary of above-mentioned definitions provide Siudek and Zawajska (2014, p. 94), according to them competitiveness should be defined as "a set of characteristics of one object with respect to comparable objects (benchmarks) on the market".

Competitiveness can be examined from various points of view. Stoica et al. (2016) define micro-economic, regional and national or macro-competitiveness. Delgado et al. (2012) differentiate product, business unit, firm and industry, regional, national and sub-national level. For the purposes of this paper we define competitiveness at national or a country level and competitiveness on a firm level.

At a country level, there is considerable disagreement over the idea of competitiveness (Cellini and Soci, 2002; In: Kitson et al., 2004). Approaches to competitiveness at a country level very often refer to international trade and comparative advantage of nations when producing certain commodities which are the subject of foreign trade (Siudek and Zawojka, 2014). A pioneering approach is the definition of Scott and Lodge (1985, p. 3), who define competitiveness as: *“a country’s ability to create, produce, distribute and/or service products in international trade while earning rising returns on its resources”*. Also several international institutions addressing competitiveness define this term similarly. The US Commission on Industrial Competitiveness defines competitiveness as the country’s ability to produce goods and services that meet the test of international markets while simultaneously maintaining and expanding the real income (Tyson, 1992). Almost the same is the definition of OECD (1992), which defines competitiveness as the degree to which, under open market conditions, a country can produce goods and services that meet the test of foreign competition and simultaneously maintain and expand domestic real income. According to International Institute for Management Development, competitiveness is *„the ability of a country to create added-value and thus increase national wealth by managing assets and processes, attractiveness and aggressiveness, globality and proximity, and by integrating these relationships into an economic and social model”* (Cellini and Soci, 2002, p. 75).

Most of the theories of competitiveness argue that the competitive position of any country, region and business is determined by its productivity being, on the one hand, considered as a main determinant of competitiveness, and, on the other hand, equal to competitiveness (Siudek and Zawojka, 2014). Porter (1990) states, that the only meaningful concept of competitiveness on a country level is productivity. In his opinion the main goal of a country is to produce a high and rising standard of living for its citizens. The ability to do so then depends on the productivity with which a country’s labour and capital are employed. Similarly according to Krugman (1990) competitiveness is simply another way of saying productivity. Productivity is very important also for World Economic Forum which defines it as the ability of a national economy to achieve sustained rates of economic growth measured by the annual changes in GDP per capita (WEF, 1996). An inspiring approach to the competitiveness is offered by Schumpeter in his theory of entrepreneurship and innovations. According to this author the ability of a business to innovate is a key for achieving competitive advantage over its competitors. The ability to create new solutions and the predisposition to take risks associated with testing them in the market highlight the competitive process and entrepreneurship (Schumpeter, 1950; In: Siudek and Zawojka, 2014).

Some authors are of the opinion that nations themselves do not produce products or services. In this regard Storper (1995; In: Henricson et al., 2004) argues that competitiveness reflects the ability of an economy to attract and maintain firms with stable or growing share in activity, while maintaining or enhancing standards of living for those who participate in it. Similarly according to IMD World Competitiveness Center (IMD 2012, p. 502; In: Charles and Zegarra, 2014), competitiveness is *“a field of economic knowledge, which analyses the facts and policies that shape the ability of a nation to create and maintain an environment that sustains more value creation for its enterprises and more prosperity for its people”*.

Until the 1980s the term competitiveness was a part of the microeconomics terminology. Thus, the next part of the theoretical background is devoted to defining the concept of business competitiveness. The research into competitiveness of a business should be based on the studies of Porter et al. (1985, 2006, 2007), who combines vertical levels of competitiveness and provides a systematic approach to explaining and predicting the competitiveness of a business. According to him, higher levels create preconditions for competitiveness or, more precisely, for wealth creation,

but they do not produce wealth. Wealth is created at the micro level, where human, natural and capital resources are transformed into products and services. According to the Porter model, the competitive environment in a sector is influenced by these factors: the risk of entry of new competitors, the risk of competition between the businesses in a sector, buying power, sales and the threat of substitution of the products in a sector. Porter (1985) prefers managerial definition of competitiveness and understands it as a company's ability to take advantage of market opportunity to get into a position in which it can defend or use resources for further growth. He understands external environment as the main determinant of company's ability to compete.

In 2006 Porter defined additional competitiveness criteria, namely the level of employee education, the source of competitive advantage, the willingness to delegate authority and the innovation capacity of the company. Also another authors and institutions describe competitiveness from the managerial point of view. Department of Trade and Industry (DTI, 1998) states, that business competitiveness is the ability to produce the right goods and services, at the right price and at the right time. It means meeting customers' needs more efficiently than other firms. According to Chikan (2008) business competitiveness is ability of a company to sustainably fulfil its two main goals: meeting customer requirements and profit. This can be achieved by offering goods and services which customers value higher than those offered by competitors. To do so, the company must be able to detect and adapt to changes in the business environment and meet market criteria that their competitors are not able to. The European Management Forum (1984; In: Buckley et al., 1988) defines competitiveness as the immediate and future ability of, and opportunity for, businessmen to design, produce and market goods worldwide whose price and non-price qualities form a more attractive pack than those of foreign and domestic competitors. Marimon et al. (1999) equally argue that high quality goods are the basis for the definition of competitiveness.

Many authors refer to the economic meaning of competitiveness and use this term to express the economic dominance of a particular company over the competitors within domestic and international competition (Marinic, 2008). Benes (2006) understands competitiveness as a competitive advantage in a given market situation. Pitra (2001) similarly links competitiveness with the concept of a feature that helps the business to succeed in a competitive environment. Chajdiak et al. (2011) define competitiveness as achieving the same or better results as the competition and not falling behind. According to this author being competitive means higher or more reliable incomes and better position in a market. According to Hudáková (2009), competitiveness at the corporate level means getting a stable position on the domestic but also on the foreign market, as well as achieving profit and a market share. D' Cruz and Rugman (1992) describe competitiveness „as the ability of firm to design, produce and market products superior to those offered by competitors, considering the price and non-price qualities“ (In: Ambastha and Momaya, 2004, p. 46).

Some definitions of business competitiveness are based on the lower cost production principle. Arrow and Hahn (1991) find competitive that business which minimizes costs and its revenue is sufficient to cover the costs associated with production and operation. Turner and Golub (1997) differentiate between a narrow and wider definition of competitiveness. The narrow definition of competitiveness tackles the conventional relationship between price and costs. More popular, however, is a wider understanding of competitiveness, which tackles the relationship between the economic performance and the use of financial and economic indicators. Based on the analysis of financial indicators of a business and their interpretation, we can assess and predict the future business competitiveness.

There are also definitions which are aimed at both above-mentioned claims - cost minimization and ability to win in competition. Select Committee of the House of Lords (1985; In: Buckley et al., 1988) defines firm competitiveness as follows: a company is competitive if it can produce products and services of highest quality and lower costs than its domestic and international competitors. Competitiveness is synonymous with a company's long-term profitability and its ability to compensate its employees and provide superior returns to its owners. Long-term profitability is crucial also for Buckley et al. (1988), who define competitiveness as a synonym for long-term profitability, abil-

ity to pay employees, ability to provide above-average revenues for owners.

Oral et al. (1999) see the link between competitiveness and productivity. Productivity has often been termed as surrogate of competitiveness and good indicator of long-term competitiveness of a firm (Ambastha, Momaya, 2004). Similarly Porter et al. (2007) argue that competitiveness is measured by productivity. Productivity supports high wages, strong currency and attractive returns on capital. Henricson et al. (2004, p. 338) summarize all above-mentioned definitions and conclude that „*firm competitiveness is related to market performance, with high productivity and low costs being the keys to success*“.

According to Malega and Mihok (2007) in Slovakia, competitiveness is assessed usually based on productivity and economic efficiency. Since the conditions of the external environment such as the strength of competition, the structure and level of costs, the availability of resources – basic raw materials, finances and human resources – are in each sector approximately the same for all enterprises, all it takes to improve one's position in the market is to focus on the internal functioning of a business, increasing its potential and improving its performance and efficiency (Krauszova and Janekova, 2008).

The precondition for competitiveness of businesses is their financial health. Therefore it is necessary to pay more attention to evaluating businesses' financial health and predicting their bankruptcy (Stefko et al., 2012). O'Farrell and Hitchens (1988) processed within a few years a number of studies devoted to the relationship between sources of competitiveness and business performance. In one of these studies they compared the results of performance with competitiveness results of analysed sample of businesses. Since our research was focused on the evaluation of competitiveness, we chose methods which are further defined in this paper. When assessing businesses' competitiveness, we assumed that the competitiveness of the business is determined by its profitability and therefore its performance, efficiency and solvency, too.

In line with the topic of the paper we identified this research problem and research questions: *Research problem:* Which method for the calculation of competitiveness is able to incorporate all areas of business financial health to the measurement of competitiveness? *Research questions:* Can we assess the competitiveness of a business applying measures of business profitability? Is it appropriate to add profitability indicators to the indicators of liquidity in the measurement of competitiveness? Is EVA an appropriate measure of competitiveness from an economic point of view? *Aim:* The aim of the paper is to find out whether EVA indicator is an acceptable measure for the evaluation of business competitiveness.

2. DATA AND METHODOLOGY

The research aimed at the calculation of competitiveness with the application of financial indicators was carried out on a sample of 343 businesses operating in Slovak heat industry. For the calculation of financial indicators and competitiveness evaluation, we used the data for the year 2016 obtained from the Slovak analytical agency CRIF – Slovak Credit Bureau, s.r.o. (CRIF, 2018). Analysed businesses are local central heat supply systems, which according to the classification of economic activities SK NACE belong to Steam and air delivery and cold air distribution. Sources and distribution of heat of these businesses were built along with the development of urban agglomerations. Their systems allow effective use of various sources of energy generated in the city, including renewable sources, waste heat, and so on. These systems are an energy infrastructure integrator which can efficiently link the production and consumption and enable to store energy (in the form of heat) at the time of its surplus. As part of the independent heat production, today about 54% of the heat is produced in combined production (Janis, 2018). European Commission's winter energy package sets new targets for energy efficiency. These goals and new trends in energy bring new opportunities and challenges for the heating industry. These facts are a precondition for the occurrence of risk factors which affect business economics and competitiveness of analysed firms

from outside. We selected this sample of businesses because it is an interesting sector which accounts for 3-5% of Slovak gross domestic product. A large number of small businesses have been set up in this sector. These businesses are trying to compete with larger heat producers and distributors mainly by their pricing policy and lower costs. From this point of view, it is interesting to analyse and measure their competitiveness within Slovakia and to assess the stability of these businesses and their possible development.

The process of research, which consisted of five basic steps, is shown in Figure 1.

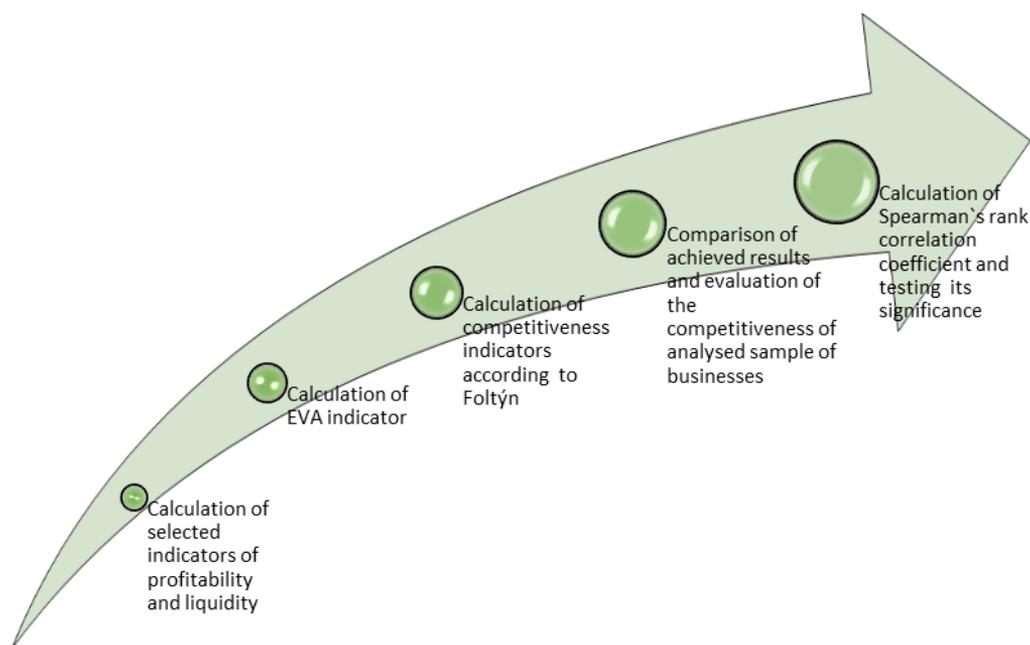


Figure 1. Basic steps of the research

Source: authors

To measure competitiveness, we selected economic parameters, namely profitability and liquidity indicators and EVA indicator. As profitability indicators, we applied Return on assets (ROA), Return on equity (ROE), Return on sales (ROS), Return on costs (ROC). Within liquidity indicators we analysed Total liquidity (TL), Current liquidity (CL), Quick ratio (QR) and Net working capital (NWC). In addition to these indicators we calculated and analysed Economic Value Added (EVA) in its two modifications EVA Equity and EVA Entity. EVA indicator is performance measure. It is a synthetic indicator which takes into account the effects of all areas of business financial health. If the business achieves a negative EVA, it is inefficient and may have competitiveness problems due to problems with its performance.

EVA method was developed by Stern Stewart Corporation as a synthetic measure of financial performance. According to Stern Stewart Corporation (2002), EVA is a financial performance metric which is most directly linked to the creation of shareholder value, over time. Based on the assumption that business competitive position is determined by added value created by the company, Grabowska (2014) argues that to assess business competitiveness we can use for example EVA. Business is competitive when $EVA > 0$. According to Stern Stewart Corporation EVA is calculated as (Stewart, 1991):

$$EVA = NOPAT - WACC \times IC, \quad (1)$$

where *NOPAT* stands for Net operating profit after taxes, *WACC* is Weighted average cost of

capital and *IC* represents Invested capital or Economic asset. This approach to the calculation of EVA indicator is also called EVA Entity (Mařík et al., 2011).

EVA Equity is calculated as (Damodaran, 2002):

$$EVA_{Equity} = (ROE - r_e) \times E, \quad (2)$$

where *ROE* is Return on equity, *E* is Equity and *r_e* represents Rate of alternative cost of equity.

For the calculation of Weighted average cost of capital we used Modigliani-Miller Model (Mordard and Balu, 2009; Alihodžić and Erić, 2013):

$$WACC = r_e \cdot \frac{E}{IC} + r_d \cdot (1 - t) \cdot \frac{D}{IC} \quad (3)$$

where *E* stands for Equity, *r_d* represents Cost of debt, *D* is Debt and *t* is tax rate.

Cost of equity was quantified applying Capital Assets Pricing Model (CAPM) - we used the following formula (Damodaran, 2001):

$$r_e = r_{fUSA} + \beta \times ERP_{USA} + CRP, \quad (4)$$

where *r_f* is Risk-free rate of return of US T-bonds, *ERP* stand for Equity risk premium of US market, *β* is coefficient of systematic risk and *CRP* represents Country risk premium.

We calculated *r_e* with the use of data from Damodaran's website (Damodaran (2019)).

When assessing competitiveness, we can supplement profitability ratios by indicators of solvency and ability to pay. Based on the above-mentioned we can apply Foltýn's (2000) methodology. The method uses three indicators according to which enterprises are divided into four groups.

Indicator PP1 = Fast solvency (Current capital/Short – term liabilities);

Indicator PP2 = Sales/Costs; Indicator PP3 = Gross Income/Short – term liabilities.

Rating: Group 1: businesses with *PP1* ≥ 1.5, *PP2* ≥ 1 and *PP3* ≥ 1; Group 2: businesses with *PP1* ≥ 1.3, *PP2* ≥ 0.85 and *PP3* ≥ 0.9 (except for group 1); Group 3: businesses with *PP1* ≥ 1.1, *PP2* ≥ 0.7 and *PP3* ≥ 0.5 (except for group 1 and 2); Group 4: other businesses (except for group 1, 2 and 3).

The first group is characterized by Foltýn (2000) as profitable (*PP₁* and *PP₂* above 1) and at the same time solvent (short-term liabilities are secured by capital with a minimum reserve at the level of 50%) businesses. The second group consists of business that are not as profitable as they should be (*PP₁* and *PP₂* slightly below 1) but still are adequately solvent (with a minimum of 30% reserve for covering short-term liabilities by capital) businesses. These may become profitable in a short term, for example with some support from the state. The third group is composed of businesses with limited profitability (values of *PP₂* and *PP₃* are very low) but with adequate solvency (with a 10-30% margin for covering short-term liabilities using their capital). The fourth group includes businesses that, according to the selected criteria, have no prospect of profitability or solvency. The match of rankings of the competitiveness calculated for the businesses in question when applying Foltýn's PP and EVA was measured by Spearman's rank correlation coefficient. This coefficient is used to determine whether two variables (X, Y) correlates or not. When calculating Spearman's "p" of two independent datasets *K_x* = (*K_{x1}*, *K_{x2}*, *K_{xn}*) and *K_y* = (*K_{y1}*, *K_{y2}*, *K_{yn}*) of the same range "n", we have assigned a ranking to each business within the dataset *R_{Kxi}*, *R_{Kyi}*. Then we calculated the difference in rankings *d_i* = *R_{Kxi}* - *R_{Kyi}* for all businesses. If the values in datasets aren't the same (it means they are not repetitive), it is not necessary to make an average of rankings and Spearman's rank correlation coefficient can be calculated according to formula:

$$p = 1 - \frac{6 \times \sum_{i=1}^n d_i^2}{n \times (n^2 - 1)}$$

The values of correlation coefficient closer to 0 point to a weaker relationship of variables, values closer to 1 or -1 point to a stronger relationship. If datasets show the same values, we need to calculate the match of rankings according to formula (Stiglic, 2009):

$$p = \frac{\frac{1}{6}(n^3 - n) - \sum_1^n d_i^2 - T_x - T_y}{\sqrt{\left[\frac{1}{6}(n^3 - n - 2T_x)\right] \left[\frac{1}{6}(n^3 - n - 2T_y)\right]}}$$

where T_x, T_y , for each repeated value in the group X, Y is the number of repetitions deducted from the third power of the repetition in question, and the results are summed. $T_x = \sum_1^{S_x} (t_{i(x)}^3 - t_{i(x)})$, S_x, S_y , number of repetitions in the group X (Y), $t_{i(x)}, t_{i(y)}$ represents the number of repetition of the value X_j, Y_j in the group X (Y).

For larger sets ($n > 30$), the probability distribution can be approximated by a t-distribution with $(n-2)$ degrees of freedom. Then the test statistic for the Spearman coefficient has the form:

$$t = p \sqrt{\frac{(n-2)}{(1-p^2)}}$$

We use this random variable even if in the groups X and Y are more repeated values. The null hypothesis H_0 , which states that there is no statistically significant relationship at significance level $\alpha = 0.05$, is rejected (we accept alternative hypothesis H_1) assuming that $|t| \geq t_{1-\frac{\alpha}{2}}$ (for one-sided test); $|t| \geq t_{1-\alpha}$ (for two-sided test), $t_{1-\frac{\alpha}{2}}; (t_{1-\alpha})$ is the critical value of Student's t-distribution with $(n-2)$ degrees of freedom. We chose the correlation coefficient based on the results of the normality tests and a two-dimensional point diagram with an ellipse of 95% constant probability density. This verification as well as calculation of test statistic and Spearman's coefficient were performed using software Statistica.

3. RESULTS AND DISCUSSION

The starting point for assessing the competitiveness of the analysed sample of businesses was the calculation of selected profitability indicators. The average values of profitability indicators were as follows: ROS -28%, ROE 14%, ROA 5.5% and ROC 7%. Based on theoretical assumptions, the achieved profitability values of the analysed businesses can be a precondition for competitiveness problems. The descriptive statistics of the profitability indicators is shown in Table 1.

Table 1. Selected profitability values

Variable	Descriptive Statistics of the profitability indicators					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
ROA	343	0.055	0.0458	-0.89	2.07	0
ROE	343	0.14	0.130	-16.18	9.10	2
ROS	343	-0.28	0.037	-91.78	0.07	497
ROC	343	0.07	0.035	-3.63	3.42	0

The worst values of the analysed indicators of profitability achieved indicator ROS. Up to 89 businesses have a negative value of this indicator. A comparison of selected profitability indicators is shown in Figure 2, where we can see that the mean value of the indicator ROS is -28%. We can assume that these 89 businesses have problems with profitability and thus competitiveness, especially in the long term.

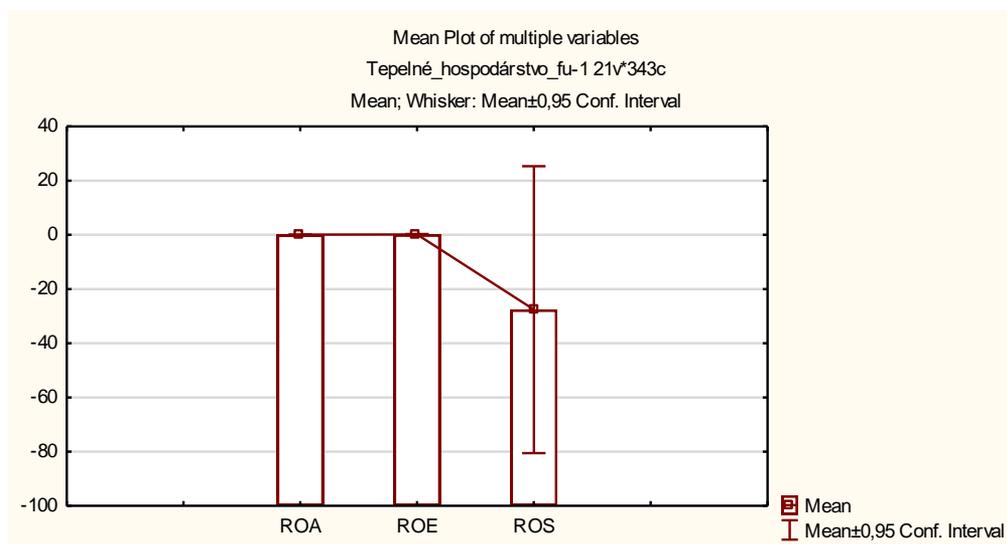


Figure 2. Box plot of the profitability indicators

Source: authors

The second major area of businesses` financial health evaluation, which affects competitiveness, is liquidity. The results of selected liquidity indicators are shown in Table 2. Based on these results we can conclude that the analysed sample of businesses shows liquidity problems. The problems concerns mainly Total liquidity and Current liquidity, as the median of these indicators is below 1. According to the achieved results we can say that 124 businesses achieved the required value of liquidity, therefore they have a precondition for competitiveness. The fact that other businesses have problems with competitiveness is confirmed by the prevailing negative values of net working capital.

Table 2. Descriptive statistics of selected liquidity indicators

Variable	Descriptive Statistics					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
TL	343	4	0.9	0	118	13
CL	343	4	0.8	0	118	12
QT	343	2	0.3	-0	81	9
NWC	343	-654,140	-74,953.0	-180,512,069	136,730,064	13,517,753

Source: authors

The results of the calculation of EVA Equity and EVA Entity are shown in Figure 3. The analysis shows that 163 companies achieved positive value of EVA equity therefore they fulfilled the requirement of competitiveness. In the case of EVA entity it concerns 217 businesses.

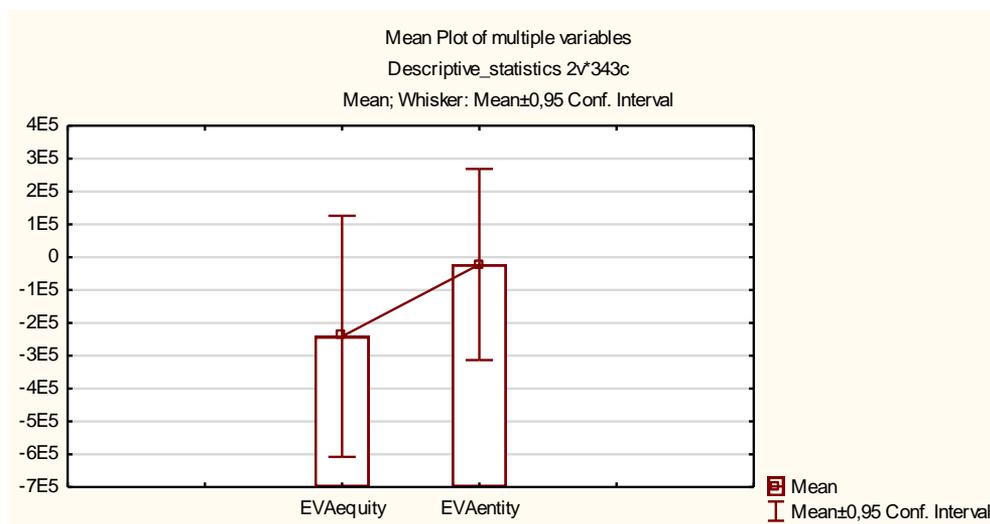


Figure 3. Boxplot of the EVA indicators

Source: authors

Previous analyses were based on the evaluation of individual areas of business financial health and performance. However, it is not possible to adequately assess the competitiveness of a company based on one area. Therefore, a more suitable methodology for assessing competitiveness is the Foltýn`s methodology, which simultaneously evaluates profitability and liquidity indicators and classifies businesses according to the achieved results into 4 groups of competitiveness. The results of competitiveness indicators are shown in table 3.

Table 3. Descriptive statistics of indicators PP₁, PP₂, PP₃

Variable	Descriptive Statistics					
	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.
PP ₁	343	3.776578	0.877452	0.0194	118.2085	12.51135
PP ₂	343	0.956297	1.007613	-3.8373	2.5048	0.48321
PP ₃	343	0.564315	0.078914	-55.9370	82.3811	6.58401

Source: authors

Based on the assessment of competitiveness using Foltýn`s methodology we arrived at the following conclusions. In the case of PP₁, 85 businesses achieved the value higher than 1.5. 15 businesses located in group 2; 23 businesses located in group 3 and finally 220 businesses located in group 4. In group 4 are businesses which fast solvency is less than 1.1. The results show that 64% businesses from the analysed sample have liquidity problems and may have competitiveness problems. In the case of PP₂, 186 businesses achieved the value higher than 1; 70 businesses higher than 0.85; 24 businesses higher than 0.7 and 63 businesses have profitability problems. The last one was PP₃. In the case of this indicator businesses achieved the worst score. Only 29 businesses achieved the best value of PP₃, which means PP₃>1; 2 businesses reached the value higher than 0.9 and 33 businesses higher than 0.5. Other businesses did not achieve mentioned values. These businesses have no perspective of solvency. Out of the 343 businesses, 20 businesses can be considered competitive based on Foltýn`s methodology. Overall, we can say that 220 businesses have liquidity problems and 279 businesses have profitability problems. Table 4 shows the classification of businesses based on Foltýn`s methodology.

Table 4. Classification of businesses based on Foltyn`s methodology

	Group 1	Group 2	Group 3	Group 4
Number of businesses	20	40	178	105

Source: authors

The largest one is group 3. It can be assumed that the competitiveness of businesses in this group will be lower. This is due to the fact that businesses in this group have problems with profitability, which may affect competitiveness especially in the long term.

3.1 Spearman`s rank correlation

Before using an appropriate correlation coefficient to determine the relationship between indicators $PP_{1,2,3}$ and EVA, we tested the normality of random variables (EVA and $PP_{1,2,3}$). Based on table 5 we can reject the normality of the EVA indicator as well as the normality of the $PP_{1,2,3}$ indicator.

Table 5. Results of normality tests

Variable	N	max D	Tests of Normality		
			Lilliefors p	W	p
EVA	343	0.058325	p < .05	0.954669	0.000000
$PP_{1,2,3}$	343	0.049794	p < .05	0.987296	0.004227

Source: processed in software Statistica

Failure to meet the normality is evident from the two-dimensional dot plot (figure 4). In the figure we can see that some values are placed outside the ellipse.

Businesses were ranked based on the calculated values of indicators $PP_{1,2,3}$ and EVA indicator. Our aim was to find a match of rankings when applying indicators $PP_{1,2,3}$ and EVA indicator. Based on the applied tests (to determine normality), the match of rankings was calculated with the use of Spearman`s rank correlation coefficient. Due to the size of processed data, we do not provide table showing rankings of businesses. Table 6 shows results of Spearman`s rank correlation coefficient. Based on it we can say that we reject null hypothesis which states that there is no statistically significant relationship and we accept alternative hypothesis H_1 . The value of the coefficient indicates that there is a medium relationship between the examined random variables.

Table 6 shows the value of test statistic $t(n-2)$. The quantile of Student's distribution found in the statistical tables for reliability of $1-\alpha$ and degrees of freedom $(n-2)$, is $t_{0,95}(341) = 1,645$ (statistical tables). After determining the right-hand critical domain $W = W = <1,645, \infty)$, we found out that the test variable is located in the critical domain therefore we reject the null hypothesis and accept the alternative hypothesis H_1 . Between the tested random variables (EVA and $PP_{1,2,3}$) is proportional medium relationship.

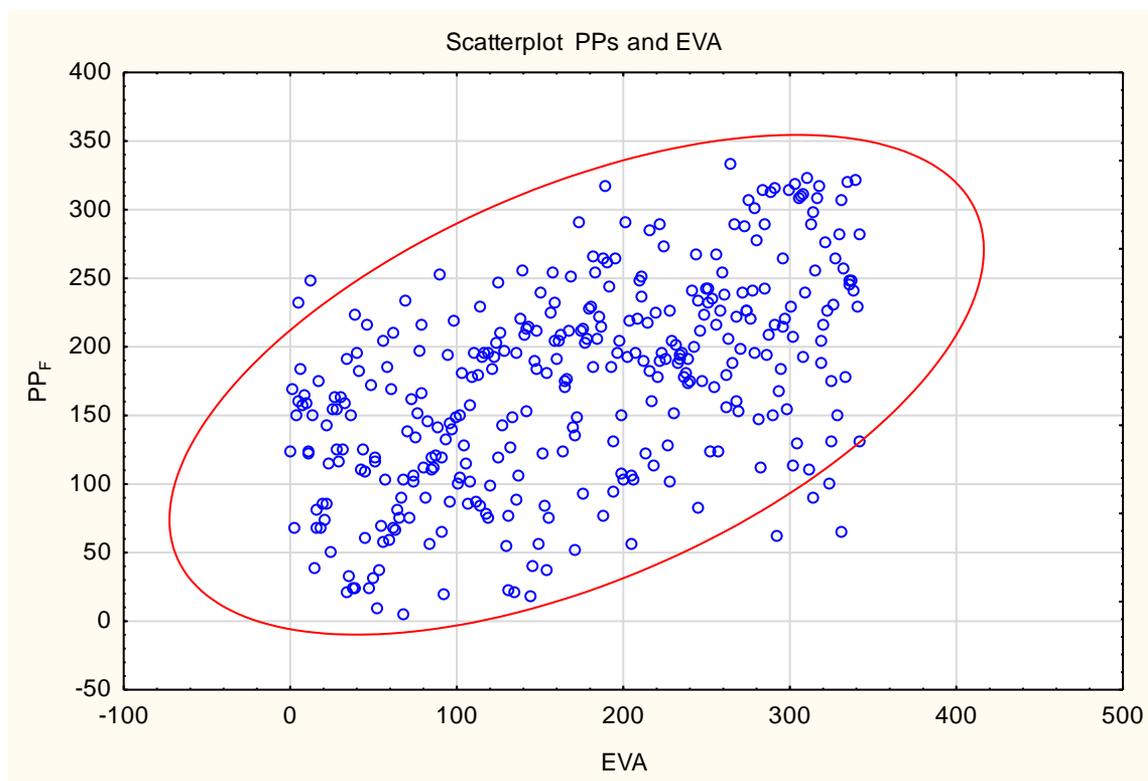


Figure 4. Dot plot of PPs and EVA indicator

Source: authors

Table 6. Results of Spearman`s rank correlation coefficient

Pair of Variables	Spearman Rank Order Correlations MD pairwise deleted			
	Valid N	Spearman R	t(n-2)	p-value
EVA ranking & PP ranking	343	0.536065	11.72630	0.000000

Source: processed in software Statistica

CONCLUSION

Any business interested in developing and increasing competitiveness should, first of all, evaluate its current situation in terms of its financial health and performance. In order to improve its competitive position, the company must focus on internal processes and increasing of business potential, efficiency and performance. In our research, we have confirmed that EVA indicator is an appropriate input for the assessment of competitiveness. EVA is a synthetic indicator, which involves the impacts of analytical indicators of all functional areas of a business. It represents a combination of financial and market data and combination of internal and external influences. In addition to current development EVA indicator makes possible to incorporate the future expected market and surroundings development in its calculation. It has been proven that performance of businesses threatened with bankruptcy is low, so performance is also important in terms of their future competitiveness. Spearman`s rank correlation coefficient confirmed the medium match of businesses` rankings when applying Foltyn`s indicators PP_{1,2,3} and EVA indicator. We can assume

that EVA indicator is more appropriate criterion of competitiveness because it includes a number of factors, both inputs and outputs. Future research will be aimed at the application of relative indicators with a focus on relative EVA indicator. This methodology is beneficial when finding ways to improve performance, efficiency as well as competitiveness of a business.

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