Efficiency and Financial Performance Evaluation of the Medical Spa Sector: An Empirical Study from Slovakia

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Abstract

The issue of measuring and evaluating the enterprise performance and efficiency remains an open question, as identification and management of the financial health still represent a prerequisite for improving strategic management decision-making processes. In this regard, the aim of paper was to evaluate the performance and efficiency of the Slovak medical spa sector for the period 2012 – 2017, to examine the possible interconnection of these two dimensions of entrepreneurial activity as well as to emphasize the importance of financial situation assessment in order to develop management control system of enterprises. The results of spa sector performance measured by the Economic Value Added and efficiency quantified on the basis of linear programming using the Simplex Method revealed significant shortcomings, since both dimensions were evaluated as average and inadequately profitable for shareholders. Detailed monitoring of the development and identifying the current state of performance and efficiency of the analysed spa companies is a fundamental starting point for financial managers within the implementation of new tools, techniques and systems for their continuous improvement. Thus, performance efficiency management is essential to achieve sustainable success, goals, plans, strategies and competitive position of enterprises.

Keywords: *performance management; medical spa sector; business efficiency; matrix model.*

1. Introduction

The ongoing globalization processes and growing competitive environment force enterprises to implement constantly new evaluation methods within the business management processes and control systems to help achieve future strategic goals and success. As reported by Gallo, Mihalcova (2016), the main factor to company success is in monitoring the actual market situation, therefore, a competitive struggle is won only by enterprises that are adequately dedicated to measuring and evaluating performance and efficiency and use the right approaches and measuring tools. Neither the Slovak spa enterprises are no exception, as thanks to them Slovakia belongs to one of the perfect spa destinations blessed with many hot springs and mineral waters. Demographic trends in population ageing have put increasing pressure on health care costs, so spa resorts and enterprises are considered serious medicine in Slovakia. However, they do not represent a separate economic sector as it interferes with all spheres of economic and social life. In addition, spa tourism is one of the economy sectors with high growth potential and the main product line of tourism in Slovakia. For this reason, we focused on the performance and efficiency evaluation of the medical health spa sector in Slovakia by applying the Economic Value Added and Simplex Method of Linear Programming over the last 6 years (2012 – 2017). The purpose of this evaluation is not only to capture the financial position of the above-mentioned sector for a given period, but also to help managers of these spa enterprises identify areas of their competences or weaknesses. It aids in investment, financing, dividend policy and operational decision-making, too.

2. Literature review

In many research studies, the concepts of performance, efficiency and effectiveness are perceived in the same meaning. As reported by Horvathova, Mokrisova (2017), the efficiency is an important prerequisite for business performance as it represents one aggregate value comprised of multiple areas of financial and business performance assessment. Kiselakova, Horvathova, Sofrankova, Soltes (2015) also agree with above-mentioned statements and define performance measurement as a process of quantifying the efficiency and effectiveness of enterprise activities. Efficiency corresponds to the extent to which the customer's requirements are met. Effectiveness is a measure of economic exploitation of the organization's resources to provide a certain level of customer service.

2.1. Importance of the enterprise performance measurement

Organizations in today's highly competitive market must struggle to respond flexibly to changing conditions and regularly monitor the level of organizational performance. Managers solve problems how to measure the performance to prevent the improvement of one part of the business at the expense of another, and to make the system of performance measurement a management tool that supports continuous improvement (Soltes, Gavurova 2015). The analysis of the enterprise performance measurement issues is dedicated to many authors from different points of view. According to the authors Arena, Azzone, Bengo (2015), the performance evaluation represents one of the tools

helping the company management to realise right decisions. Therefore, the correct choice of method for measuring business productivity, with consideration to its specifics, can call attention to key problems and shortcomings that need to be removed (Kozena, Jelinkova 2014). In recent years, there has been growing interest on improving the quality of performance management, as well as on increasing the competitiveness through the use of decision support systems. In this regard, Popescu, Andreica, Popescu (2018) presented a proposal to develop an effective IT solution to support the managerial decision in preventing financial failure that could become a useful tool in managing and overcoming the challenges of the economic environment.

Milichovsky (2015) states that one of the fundamental problems of the company performance is how to measure the performance, since the different target groups around the company understand the performance of their point of view. For this reason, the other modern methods measuring the business performance are developed. Mihalcova, Gallo, Pruzinsky (2017) emphasize that measuring company performance by means of generally accepted indicators is a source to key information on company efficiency and its future prospects. However, as reported by Largani, Kaviani, Abdollahpour (2012), in today's competitive world, value and wealth creation for shareholders are among the most important goals of businesses. For the sake of achieving his goals, the investor needs some instruments in order to measure the potential value of each investment opportunity. It is clear that these instruments are not capable of predicting the exact future, they just provide some piece of information and advice that help the investor in the decisions he makes. From all modern financial indicators, we focused our attention on the most important one – **the Economic Value Added (EVA)**.

As reported by Ismail (2011), Kiselakova, Sofrankova (2017), the EVA belongs to advanced and appropriate modern tools to measure financial performance as it can reliably describe and predict the actual company value and enables managers to pay more attention to maximizing the shareholder wealth than traditional tools. Zakic, Nenad, Besic, Simic (2012) emphasize, that the value added is created when the net Return on Assets held by the business exceeds the return required by those who have contributed capital to the business. Accepting value creation as the paramount corporate goal is only a beginning, as managers and shareholders must determine a way to reliably measure their progress in achieving it.

2.2. Efficiency as the aspect of enterprise performance

According to Cyrek (2017), the efficiency is understood as the relationship between outputs and inputs and it is often analysed in terms of goals. Carstina, Siminica, Circiumaru, Tanasie (2015) emphasise that efficiency is closely interdependent to effectiveness, meaning that an efficiency undertaking without being effective will not have a very long period of existence, and an effectiveness of enterprise without obtaining efficiency automatically lead to unfavourable economic results. According to Turcu (2017), enterprise performance evaluation is also based on the analysis of the manner of fulfilment of indicators specific to the different activities performed within processes.

The issue of efficiency evaluation of enterprises was analysed by Popova (2018). The study dealt with the problems of Quality Management System (QMS) effectiveness evaluation in companies. The assessment of QMS effectiveness was based on the achievements of its objectives, their comparison with benchmark indicators and previous achievements of company's QMS. The author highlighted five points of QMS effectiveness: customers' satisfaction; product quality improvement; operational performance; effectiveness of QMS processes; culture of continuous improvement. Ermolina, Golikov, Kozenko, Ponosova (2018) examined strategic effectiveness of an enterprise in order to determine the role of human capital. Authors came to conclusion that human capital occupies the central role among the indicators of strategic effectiveness of enterprise, as it is a source of maximization of enterprise's profit. There are many situations in which analysis of a company needs to be performed, but only limited information are available about its structure and efficiency. Therefore, Andreica, Andreica, Andreica (2008) presented algorithmic techniques and dynamic programming systems for solving these problems.

In general, we can conclude that almost every human activity is influenced by the effort to optimize it as much as possible. Similarly, it also works in business companies. The most popular and in practice the most commonly used methods of process optimization solutions include linear programming method (Berezny, Kravecova 2012). Hyranek, Grell, Nagy (2014) also emphasize that the latest approaches to enterprise performance are aimed at evaluating the level of production system functioning, where it is necessary to measure the effectiveness of the transformation process and to implement not only financial indicators but also the indicators of efficiency and effectiveness. The authors developed an innovative approach based on the matrix system of indicators, solved by **the Simplex Method** by applying linear programming. Grell, Hyranek (2012) consider matrix system as an open, variable and adaptable complex that can be dynamically modified depending on the enterprise conditions, which is its undoubtedly great advantage. Kliestik (2009) emphasizes that the goal of the above-mentioned matrix system is to eliminate the subjectivity of evaluation by measuring outputs in relation to the inputs.

3. Data and methodology

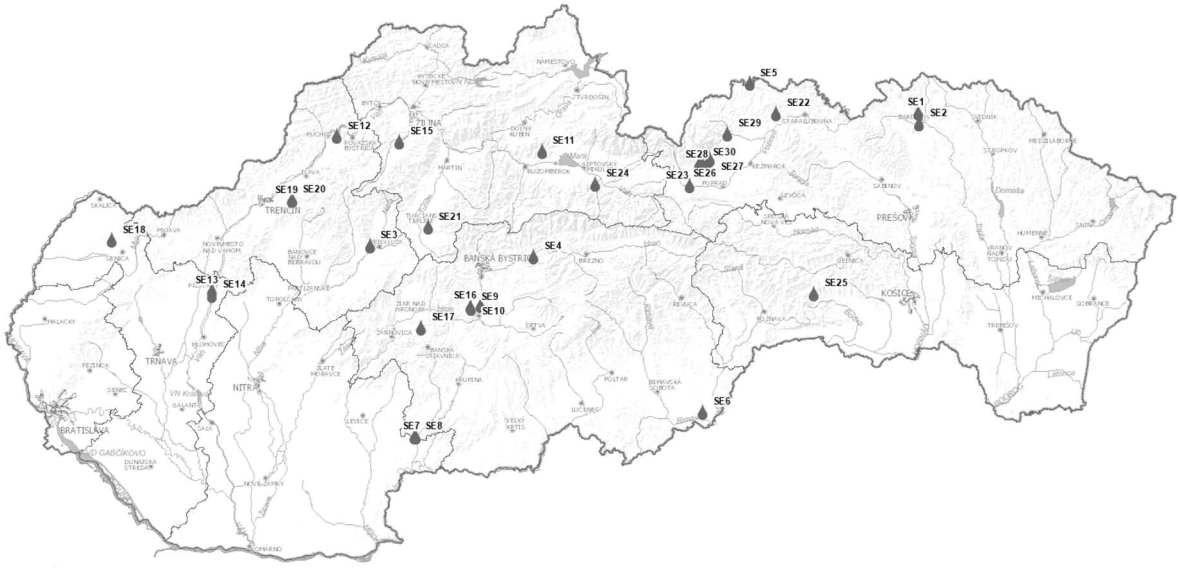
As reported by Rajiani, Bačík, Fedorko, Rigelský, Szczepańska-Woszczyna (2018), the aging of the society and the extension of life expectancy increase the demand for health care and spa services, require increased expenditure on health policy, including long-term care for the elderly.

At present, the Slovak medical health spa sector comprises a total of 28 enterprises with the official permission from the Ministry of Health of the Slovak Republic to operate the natural health spas and spa medical institutions in Slovakia (see Figure 1). Thus, we consider a given sample of enterprises as complete and, therefore, any conclusions stated in the paper are presented from the point of view of the whole sector evaluation. All financial data regarding the spa enterprises (their financial statements) that we worked with were drawn from the available internet portal managed by a company DataSpot Ltd. and processed in MS Excel.

In this paper, we addressed the performance and efficiency assessment of the Slovak medical spa sector during the years 2012–2017, surveyed the possible interconnection between these two dimensions of entrepreneurial activity and pointed to importance of financial health evaluation in order to support enterprises' management control systems. The following hypotheses were set to support the goal of the paper:

- **H0**: We assume that there is no statistically significant relation between the enterprise performance evaluation measured by the Economic Value Added and efficiency quantified as the optimization task of linear programming using the Simplex Method.
- **H1**: We assume that there is a statistically significant relation between the enterprise performance evaluation measured by the Economic Value Added and efficiency quantified as the optimization task of linear programming using the Simplex Method.

The performance of Slovak medical health spa sector was quantified on the basis of the EVA indicator. At present, there are several calculations for this indicator (equity, entity and APV method). In this paper, we applied the equity approach. The equation for calculating the EVA indicator has the following form (Neumaierova, Neumaier 2002):



where:

SE 01 Spa Bardejov, Inc.
SE 02 Spa Horezza, Inc.
SE 03 Spa Bojnice, Inc.
SE 04 Spa Brusno, Inc.
SE 05 Spa Dudince, Inc.
SE 06 Spa Lucivna, Inc.
SE 07 Spa Lucky, Inc.
SE 08 Spa Nimnica, Inc.
SE 09 Spa Novy Smokovec, Inc.
SE 10 Spa Sliac, Inc.
SE 11 Spa Stos, Inc.
SE 12 Spa Trencianske Teplice, Inc.
SE 13 Spa Vysne Ruzbachy, Inc.
SE 14 Medical thermal spa, Inc.
SE 15 Spa Ciz, Inc.
SE 16 Spa Piestany, Inc.
SE 17 Spa Rajecke Teplice, Inc.
SE 18 Spa Turcianske Teplice, Inc.
SE 19 Spa Horny Smokovec, Ltd.
SE 20 Spa Kovacova, Ltd.
SE 21 Spa Pieniny Resort, Ltd.
SE 22 Spa Slovthermae Dudince, s. p.
SE 23 Specialised spa Marina, s. p.
SE 24 Specialised spa SR Druzba
SE 25 Specialised spa SR Arco
SE 26 Specialised spa SR Bystra
SE 27 Specialised spa Dr. Guhra, n. o.
SE 28 Specialised spa Tatranska Kotlina, n. o.

Figure 1. The location of medical spa enterprises in Slovakia
Source: own processing

EVA_{equity} = (ROE – r_e) . E, where:
ROE – Return on Equity,
r_e – Cost of Equity,
E – Equity.

As stated by Nelson (2015), the achieved value of the EVA indicator should be positive. It means that the company actually produces economic profit and creates value for its owners even after paying salaries to employees, paying interest to demanders and shares to shareholders. Within the calculation of this indicator, it is essential to identify correctly the alternative rate of equity value (re). Among the various ways of quantifying it, we pay attention to the CAPM model. As reported by Damodaran (2004), the final cost of equity can be quantified as follows:

r_e = r_f + ß . ERP + CRP, where:
r_f – Risk Free Rate of Return,
ß – Beta Coefficient,
ERP – Equity Risk Premium,
CRP – Country Risk Premium.

In order to identify prosperous enterprises from non-prosperous ones, the efficiency of spa companies was therefore quantified as the optimization task of linear programming using the Simplex Method. Formulation of the basic relations in the matrix model is presented in following Figure 2. The matrix model is made up of absolute indicators, which are divided into indicators of inputs and outputs of the entrepreneurial activity. Using a linear mathematical model, weights are assigned to individual inputs and outputs to reflect the efficiency of the particular variable (Grell, Hyranek 2012).

According to Grell (2016), the matrix of efficiency consists of four basic quadrants:

- output/input – indicators of productivity, efficiency, profitability;
- input/output – indicators of difficulty, commitment, cost;
- input/input – indicators of amenities;
- output/output – indicators of profitability.

n – v	v – n	1, 2, 3, .., j, .., n $v_1, v_2, v_3, .., v_j, .., v_n$	1, 2, 3, .., k, .., m $n_1, n_2, n_3, .., n_k, .., n_m$
1 2 ... i m	n_1 n_2 ... n_i n_m	A = (a_{ij})	B = (b_{jk})
1 2 ... l n	v_1 v_2 ... v_l v_n	D = (d_{lj})	C = (c_{lk})

where:
A – efficiency matrix of inputs dimension m.n; $a_{ij} = v_i/n_j$,
C – difficulty matrix of inputs dimension n.m; $c_{lk} = n_k/v_l$,
B – matrix structure of inputs dimension m.m; $b_{jk} = n_k/n_j$,
D – matrix structure of outputs dimension n.n; $d_{lj} = v_j/v_l$.

Figure 2. General matrix structure of indicators
Source: own processing according to Grell, Hyranek (2012)

According to Grell, Hyranek (2012), in the practical solution of this issue it is necessary to start from its simplification, while minimizing the deviations between the indicators of efficiency and effectiveness. The ui vectors (in relation to the efficiency indicators) and tr vectors (in relation to the effectiveness indicators) were obtained as a solution of:

- the basic equation:

  $\min \Sigma_j w_j = 0$;

- under the conditions:

  $\Sigma_i u_i S^J_{M,ij} - \Sigma_r t_r c_{rj} - w_j = 0$
  $\Sigma t_r = 1$
  $u_i t_r w_j \geq 0$

- so finally, the order of transformation process efficiency was calculated by:

$$E_j = \Sigma_r t_r c_{rj} / \Sigma_i u_i S^J_{M,ij},$$

where:
w_j – *deviations in individual years,*
u_i – *value of weights for inputs,*
$S^J_{M,ij}$ – *inputs needed for linear programming,*
t_r – *value of weights for outputs,*
c_{rj} – *outputs needed for linear programming,*
E_j – *efficiency.*

As input variables, we chose total costs, personnel costs and material costs. Output variables were represented by total revenues, net profit and value added. Based on the variables we considered to be the most determinant of the performance within the analysed sample of enterprises, we quantified the cost of returns, wage efficiency and material efficiency by applying the modified matrix system. The outputs were quantified in relation to the total revenues (index).

In order to reveal a potential degree of association of enterprise rankings according to the achieved performance and efficiency regardless of their size, the Spearman rank correlation processed in the statistical program Gretl was used:

$$r_s = 1 - \frac{6\sum_{i=1}^{n}(x_i^* - y_i^*)^2}{n(n^2-1)}$$

where:
r_s – *Spearman rank correlation,*
$(x_i^* - y_i^*)^2$ – *the difference between the ranks of corresponding variables,*
n – *number of observations.*

The Spearman rank correlation can range from –1 to +1 and the resulting value indicates:

a) $r_s = 1 \rightarrow$ perfect degree of positive association between the two variables,
b) $r_s = -1 \rightarrow$ perfect degree of negative association between the two variables,
c) $r_s = 0 \rightarrow$ no association between the two variables (Sharma 2007).

4. Results and discussion

In the following partial analyses, the attention was firstly focused on evaluating the performance of Slovak spa companies based on the EVA application. Subsequently, we quantified the efficiency of the analysed sector and examined the interconnection of both dimensions by comparing the average resulting order of the spa enterprises in the period of 2012 – 2017 by applying the Spearman rank correlation.

4.1. Assessment of the enterprise performance of the Slovak medical spa sector

In order to compare the performance of enterprises in the spa sector under the same conditions, the Cost of Equity (r_e) and its relevant components for all enterprises was equal and quantified as the average of the individual years 2012-2017. Thus, the alternative cost of equity reached the value of 3.42% on average. In this regard, the level of EVA reached by individual spa enterprises differed depending on their Equity (E) and Return On Equity (ROE), which was mainly affected by the level of achieved profit or loss. These causes determining the poor enterprise performance were taken into account within the evaluation of the Slovak medical spa sector as a whole. Table 1 below shows the average level of primary components entering the aggregate EVA indicator for the period of 2012-2017.

Table 1. Average values of the EVA indicator and its basic components in the case of Slovak spa businesses over the years 2012-2017

Source: own processing based on financial statements of analysed enterprises

Enterprise	E (€)	ROE (%)	EVA (€)	Enterprise	E (€)	ROE (%)	EVA (€)
SE 01	11,982,684	4.62	142,911	**SE 15**	793,163	–20.08	–186,430
SE 02	17,805,953	–1.07	–799,969	**SE 16**	58,022,581	2.53	–516,557
SE 03	26,095,520	7.35	1,024,758	**SE 17**	17,819,621	3.57	26,574
SE 04	318,173	–588.88	–1,884,551	**SE 18**	8,114,341	2.64	–63,599
SE 05	14,023,183	5.61	307,164	**SE 19**	529,373	3.03	–2,108
SE 06	2,953,106	4.25	24,406	**SE 20**	–225,723	23.98	–46,389
SE 07	5,660,246	6.49	173,513	**SE 21**	26,996	–283.67	–77,503
SE 08	6,733,341	3.01	–28,096	**SE 22**	5,917,380	–0.58	–236,997
SE 09	2,132,629	2.14	–27,390	**SE 23**	4,185,428	5.34	80,338
SE 10	3,912,467	–17.05	–800,999	**SE 24**	227,697	9.88	14,702
SE 11	1,425,371	1.14	–32,509	**SE 25**	677,704	–5.53	–60,711
SE 12	23,997,557	0.64	–667,452	**SE 26**	528,834	1.20	–11,764
SE 13	9,324,700	–1.78	–485,073	**SE 27**	2,599,775	0.05	–87,729
SE 14	1,279,750	–3.06	–83,029	**SE 28**	3,207,682	–2.39	–186,621

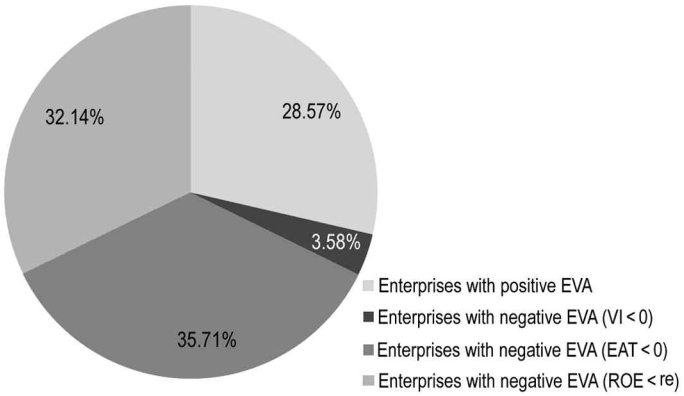


Figure 3. Structure of enterprises with positive/negative value of the EVA indicator
Source: own processing based on financial statements of analysed enterprises

Based on the results, the Slovak spa sector is considered non-performing over the analysed period, as the average value of EVA indicator ranged around € -160,396. Overall, the worst-performing enterprise was identified SE 04 (Spa Brusno, Inc.), which did not create additional value for business owners in any year of the monitored period (€ -1,884,551 on average). This undesirable result was mainly due to the highest loss and also the fourth lowest value of the Equity within the entire spa sector. The best-performing enterprise was identified SE 03 (Spa Bojnice, Inc.), which reached the highest level of Return on Equity and also the second highest value of Equity from all spa enterprises. To simplify the identification of the causes of the negative EVA value, we processed the results into the following Figure 3. The intention was to point to the average number of enterprises generating the value added for shareholders and, on the other hand, to determine the most frequent cause of the negative EVA value.

According to results achieved for individual spa companies,

it can be stated that only 8 spa companies were able to generate added value for shareholders with the average level of € 224,296. During the analysed period, the negative EVA indicator reached a total of 20 enterprises (€ -314,274 on average). After excluding the external impact (within the meaning of alternative cost of equity entering the calculation of the EVA indicator), there were not up to 71.43% of the spa companies capable of generating added value for shareholders. This fact was due to three main reasons: reporting the negative value of Equity (1 enterprise), loss (10 enterprises) or insufficient level of the Return On Equity (9 enterprises).

4.2. Assessment of the enterprise efficiency of the Slovak medical spa sector

To quantify the efficiency of the Slovak spa enterprises over the period of 2012-2017, we applied a linear programming apparatus solved by the Simplex Method using a matrix mapping of three selected input (cost) and output (revenue) items. The input group consisted of total costs, personnel costs and material costs. Total revenues, net profit and added value formed the group of output items. The above-mentioned metrics were selected so that inputs/outputs included the total value of costs/revenues, their selected aggregate items (personnel costs and value added) and finally their specific items (material costs, net profit). Thus, all cost/revenue levels were represented.

The efficiency solution by means of linear programming consisted of input weights (u_i), output weights (t_r) and deviations (w_j) of selected indicators, the sum of which had to be minimized. In the following Table 2 is presented a sample of the initial input and output values surveyed during the analysed period, whereas the individual values represent the average of the entire medical spa sector. In terms of inputs, we have quantified the cost of returns, wage efficiency and material efficiency. The outputs were quantified in relation to the total revenues (index).

Enterprise	Inputs			Outputs		
	Total costs (n_1)	Personnel costs (n_2)	Material costs (n_3)	Total revenues (v_1)	Net profit (v_2)	Added value (v_3)
	Cost of returns	*Wage efficiency*	*Material efficiency*	*In relation to total revenues*	*In relation to total revenues*	*In relation to total revenues*
SE01	€ 10,411,783	€ 3,207,284	€ 2,300,466	€ 10,964,926	€ 533,143	€ 5,867,667
	0.9496	***0.2925***	***0.2098***	***1.0000***	***0.0504***	***0.5351***
.....	.....	.....	.....	.....	.....	.....
SE28	€ 1,465,474	€ 864,197	€ 326,007	€ 1,388,670	€ –76,805	€ 123,089
	1.0553	***0.6223***	***0.2348***	***1.0000***	***–0.0553***	***0.3228***

Table 2. Input data needed for application of linear programming using the Simplex Method
Source: own processing based on financial statements of analysed enterprises

Based on the results processed in MS Excel, we can state that the highest weight of the selected inputs was proved in the case of Material efficiency indicator (u_3 = 2.4009). In this regard, we can consider this indicator as the most important determinant of efficiency, as well as the performance of the Slovak spa companies. Within the selected outputs, the highest weight was assigned to the Net profit (v_2 = 0.6703) and Total revenues (v_1 = 0.3297). On the basis of calculated weights, we subsequently quantified the efficiency of the selected sample of enterprises (see Table 3).

Enterprise	Deviation (w_j)	Efficiency (E_j)	Enterprise	Deviation (w_j)	Efficiency (E_j)
SE 01	0.1402	0.72161	**SE 15**	0.3624	0.43178
SE 02	0.3495	0.47029	**SE 16**	0.1252	0.74036
SE 03	0.0000	**1.00000**	**SE 17**	0.2058	0.64648
SE 04	0.7602	0.10610	**SE 18**	0.1691	0.66894
SE 05	0.0000	**1.00000**	**SE 19**	0.1421	0.70683
SE 06	0.0634	0.84682	**SE 20**	0.1599	0.64201
SE 07	0.0442	0.89497	**SE 21**	0.0524	0.82500
SE 08	0.3077	0.53719	**SE 22**	0.3125	0.50738
SE 09	0.0000	0.64746	**SE 23**	0.0373	0.90862
SE 10	0.5971	0.25729	**SE 24**	0.2642	0.56296
SE 11	0.1488	0.69284	**SE 25**	0.2633	0.54313
SE 12	0.0983	0.77465	**SE 26**	0.2010	0.62307
SE 13	0.3281	0.47263	**SE 27**	0.2527	0.56645
SE 14	0.2167	0.59565	**SE 28**	0.2710	0.51911

Table 3. Average values of achieving deviation and efficiency in the case of Slovak spa businesses over the years 2012-2017
Source: own processing based on financial statements of analysed enterprises

Based on the results, it can be stated that only two spa enterprises reached the maximum efficiency at the level of 1.0000 (Spa Bojnice, Inc. and Spa Dudince, Inc.). The efficiency of all other enterprises during the monitored period reached a level of less than 1, ranging from 0.25729 to 0.90862. Taking into account the other partial results, Spa Bojnice, Inc. can be considered as the most effective enterprise, as it reached the highest value of Net profit (€ 1,918,149), created the second highest Added value (€ 6,468,404) and material intensity indicator was maintained at the stable level of 0.1930. Despite of generated Added Value at the level of € 1,410,976 on average and the second highest value of the material intensity (0.2863), Spa Brusno, Inc. as the only one achieved insufficient efficiency at the level of 0.10610. This fact was undoubtedly affected by the highest average loss within the entire spa sector (€ -1,873,658 on average).

For more comprehensible results processing, we have subsequently created a categorization of five basic efficiency zones reflecting its achieved level in the case of Slovak spa companies:

- $E_j = 1$ Required efficiency;
- $1.00 < E_j > 0.75$ Above-standard efficiency;
- $0.74 < E_j > 0.50$ Middle efficiency;
- $0.49 < E_j > 0.25$ Substandard efficiency;
- $0.24 < E_j > 0.00$ Insufficient efficiency.

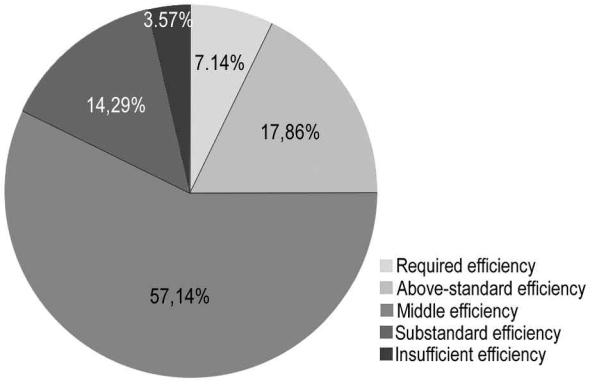


Figure 4. Categorization of spa enterprises within the individual zones of efficiency
Source: own processing based on financial statements of analysed enterprises

The required level of efficiency was achieved only in the case of the above mentioned two spa companies, which accounted for only 7.14% of the analysed sector (see Figure 4). A total of 5 enterprises were able to reach efficiency above the level of 0.75, which included them in a group of enterprises with above-standard efficiency. Up to 57.14% of spas were classified as a group of middle efficiency enterprises. The remaining 17.86% of the spa sector enterprises were unable to achieve the efficiency level higher than 0.49, whilst even one enterprise was included in a group characterized by insufficient level of efficiency. Overall, the Slovak medical spa sector reached a moderate level of efficiency (0.63963).

4.3. Exploring the relationship between performance and efficiency of spa companies

On the basis of previous partial analyses, we have focused on revealing the degree of resulting rank compliance of spa companies in the case of applying selected methods of enterprise performance (the EVA indicator) and efficiency (the Simplex Method) quantification. When calculating the degree of resulting rank compliance we applied the Spearman rank correlation. Table 4 below shows the resulting average performance and efficiency ranking of spa enterprises based on the application of the selected assessment methods during 2012-2017.

Table 4.
The average resulting rank of the spa enterprises compiled on the basis of the EVA indicator and linear programming using the Simplex Method

Source: own processing based on financial statements of analysed enterprises

Enterprise	Rank		$(x_i - y_i)^2$	Enterprise	Rank		$(x_i - y_i)^2$
	Simplex Method (x_i)	*Economic Value Added (y_i)*			*Simplex Method (x_i)*	*Economic Value Added (y_i)*	
SE 01	9.	4.	25	**SE 15**	26.	20.	36
SE 02	25.	26.	1	**SE 16**	8.	24.	256
SE 03	**1.**	**1.**	0	**SE 17**	14.	6.	64
SE 04	**28.**	**28.**	0	**SE 18**	12.	16.	16
SE 05	2.	2.	0	**SE 19**	10.	9.	1
SE 06	5.	7.	4	**SE 20**	15.	14.	1
SE 07	4.	3.	1	**SE 21**	6.	17.	121
SE 08	21.	12.	81	**SE 22**	23.	22.	1
SE 09	13.	11.	4	**SE 23**	3.	5.	4
SE 10	27.	27.	0	**SE 24**	19.	8.	121
SE 11	11.	13.	4	**SE 25**	20.	15.	25
SE 12	7.	25.	324	**SE 26**	16.	10.	36
SE 13	24.	23.	1	**SE 27**	18.	19.	1
SE 14	17.	18.	1	**SE 28**	22.	21.	1

From the results shown in Table 4, it is obvious that spa companies SE 03 (Spa Bojnice, Inc.), SE 04 (Spa Brusno, Inc.), SE 05 (Spa Dudince, Inc.) and SE 10 (Spa Sliac, Inc.) reached the same average resulting rank in case of application of both selected methods of performance and efficiency evaluation. As we have already mentioned, other input data and indicators entering the calculations of both methods led to a bit different assessment. Despite the fact that most enterprises did not reach identical performance position measured by the selected methods, we have to emphasize the identification of the best and the worst-performing and efficient spa enterprise.

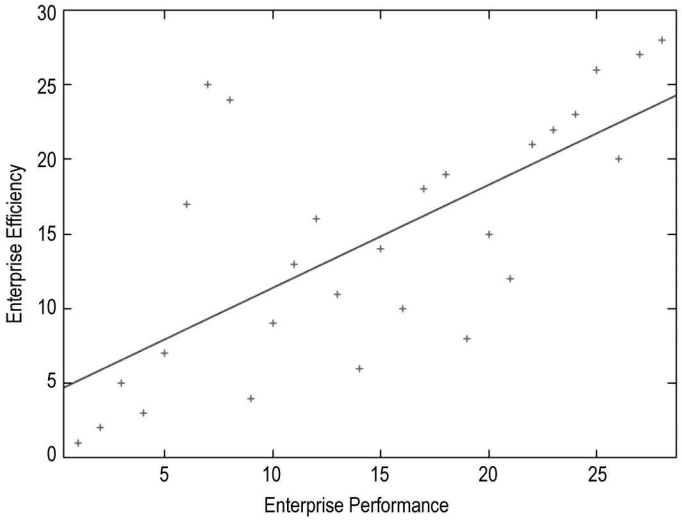


Figure 5. The result of Spearman rank correlation
Source: own processing in the statistical program Gretl

As the resulting Spearman rank correlation coefficient reached the level of 0.6907, it is obvious that enterprise performance is closely related to enterprise efficiency. However, the perfect degree of positive association between the two variables was not confirmed. Based on this result and p-value lower than 0.05 (0.0003), we reject the established H0 hypothesis and accept an alternative H1 hypothesis. In this regard, it can be concluded that there is a statistically significant linear relationship (relatively strong direct dependence) between the given variables – the enterprise performance and efficiency. Result of the above-mentioned statistical test is also presented graphically in the Figure 5.

5. Conclusion

Nowadays, there is a wide range of models and methods to help assess the financial situation of the enterprises. However, the management of each enterprise decides which financial instruments are used to assess its business activity. In this regard, more and more modern methods are being introduced to quantify the enterprise performance and efficiency in terms of increasing its market value. Comprehensive monitoring, quality management and continuous performance improvement is an important element in detecting possible future business risks that can contribute to meeting the strategic goals set in all areas of business.

The purpose of paper was to evaluate the performance and efficiency of the Slovak medical spa sector for the period 2012 – 2017, to reveal the possible interconnection of these two dimensions of entrepreneurial activity as well as to emphasize the importance of financial health and efficiency assessment. On the basis of performed partial analyses, we have come to the following conclusions:

- Over the years 2012-2017, only eight Slovak spa companies were able to create additional value for their business owners and increase the company's market value.

- The average level of the EVA indicator ranged around € -160,396. The most common cause of the negative EVA indicator was reporting the negative Earnings After Taxes (loss), which was subsequently reflected in the insufficient level of the Return On Equity as well as the Cost of Equity. Thus, the Slovak medical spa sector can be considered as non-performing.
- The highest weight among the input/output variables was reached in the case of Material efficiency indicator, Total revenue and Net profit. In this respect, these three metrics were identified as key determinants of efficiency.
- The maximum required efficiency at the level of 1.0000 was achieved by two spa enterprises and only one enterprise was included in a group characterized by an insufficient level of efficiency. Overall, we can rank the Slovak medical spa sector to a moderate level of efficiency, as the average value of all analysed spas ranged around 0.63963.
- Despite the fact that most enterprises did not reach identical position measured by the selected assessment methods, by applying the Spearman rank correlation coefficient (rs = 0.6907), a strong dependence was found between the performance and efficiency of the Slovak spa enterprises.

Summarizing the research, it should be noted that identifying the state of enterprise performance and efficiency give managers much more than just a snapshot of actual financial health. It can be also used as a powerful management tool to affect positive change within the individual enterprises as well as the entire economic sector – when used the right way. The processing and application of management models enhancing the performance and efficiency of business entities for the purpose of their sustainable growth will be the subject of our further scientific research studies.

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