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EVALUATION OF FINANCIAL PERFORMANCE AND EFFICIENCY OF COMPANIES IN SERBIA

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Original Scientific Paper

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Recently, various methods of multi-criteria decision-making, as well as DEA(Data Envelopment Analysis) models, have been used more and more worldwide to measure the financial performance and efficiency of companies. Based on that, this paper analyzes the efficiency of companies in Serbia using the ARAS method. According to the ARAS method, five most efficient companies in Serbia are JP POŠTA SRBIJE BELGRADE, JP EPS BELGRADE, JP SRBIJAGAS NOVI SAD, JP PUTEVI SRBIJE BELGRADE and COCA-COLA HBC - SERBIA DOO ZEMUN. First four are public companies, and the fifth is from the processing industry sector. Public enterprises are fundamentally efficient. Trading companies are well positioned. So, for example, the DELHAIZE SERBIA DOO BELGRADE retail chain is in the eleventh place. The efficiency factors of companies in Serbia are, in addition to macroeconomics, managerial skills in managing the company. They differ from company to company. Digitization of the company's entire operations plays a significant role in this.

Keywords: ARAS method; Financial performance; Efficiency; Factors; Companies; Serbia.

INTRODUCTION

The issue of analyzing the financial performance and efficiency of companies is very complex, significant, and continuously relevant. It is therefore continuously researched theoretically, methodologically, and practically. It provides a detailed insight into the factors of financial performance and efficiency and what measures should be taken to achieve the target liquidity, solvency, and profitability of the company. The analysis of the financial performance and efficiency of the company is based on traditional and modern methods. In this work, summative methods based on multi-criteria analysis are used.

Recently, due to the reality of the obtained results, it is more challenging to measure the efficiency of companies using different methods of multi-criteria decision-making. Bearing that in mind, this paper analyzes the efficiency of companies in Serbia (i.e. their ranking) using the ARAS method as a subject of the research. The goal and purpose of this paper is to process the given problem as complexly as possible in order to improve the efficiency of companies in Serbia in the future by taking appropriate measures.

As it is known, recently there has been an increasingly rich body of literature devoted to the evaluation of the efficiency of companies based on various methods of multi-criteria decision-making (Berman et al., 2018; Ersoy, 2017, 2022; Gaur et al., 2020; Levy et al., 2019; Lovreta & Petković, 2021; Tsai et al., 2021; Saaty 2008;). In this context, the role and importance of the ARAS method is increasing. In the relevant Serbian literature, for the first time, as far as we know, the performance and efficiency of Serbian companies are measured and analyzed using the ARAS method, which represents a certain scientific and professional contribution (Lukic, 2011; Lukic et al., 2019, 2021, 2022; Lukic et al., 2020a, 2020b, 2021; Lukic, 2011, 2020a 2020b, 2021a, 2021b, 2021c, 2021d, 2021e, 2021f; Lukic & Kozarevic, 2021).

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The research of the treated problem in this work is based on the fundamental hypothesis of realistic analysis of the company's efficiency factors as a key assumption for improvement in the future by taking relevant measures. This can be easily achieved with the application (integrated or individually) of various multi-criteria decision-making methods, including the ARAS method, as well as DEA models (Bnaker et al., 1984; Lukic & Hadrovic-Zekic, 2019).

MATERIALS AND METHODS

The necessary empirical data for the research of the treated problem in this paper were collected from the Agency for Economic Registers of the Republic of Serbia. Companies submit annual financial reports (balance sheet, income statement, cash flow report) to the Agency for Economic Registers of the Republic of Serbia, which further processes data for various business purposes of a macro and micro nature. Empirical data used in this paper are "manufactured" in compliance with relevant international standards. In terms of international comparability, there are no restrictions, whatsoever.

The analysis of the financial performance and efficiency of the company can be done on the basis of classic methodology - ratio analysis and modern methods based on multi-criteria analysis. They are used separately or in combination and complement each other. In this way, a more complete picture of the financial situation and efficiency of the company is obtained, and what measures should be taken in order to improve it in the future.

The Additive Ratio Assessment System (ARAS) is a multi-criteria analysis technique. It was developed by Zavadskas and Turskis (2010). Unlike other multi-criteria decision-making methods, the alternatives are ranked based on the utility function value (Chatterjee & Chakraborty, 2013; Dahooie et al., 2019; Jovčić et al., 2020; Koc & Uysal, 2017; Rostamzadeh et al., 2017; Sliogene et al. 2013). The ARAS method procedure includes several steps (Zavadskas & Turskis, 2010):

Phase 1: Create a decision-making matrix (DMM)

The decision-making matrix is created as follows:

$$X = \begin{bmatrix} x_{01} & \cdots & x_{0j} & \cdots & x_{0n} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ x_{i1} & \cdots & x_{ij} & \cdots & x_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ x_{m1} & \cdots & x_{mj} & \cdots & x_{mn} \end{bmatrix}; i = \overline{0,m}; j = \overline{1,n} \quad (1)$$

where m – the number of alternatives, n – the number of criteria describing each alternative, x_{ij} – the value representing the performance value of the i-th alternative in terms of the j-th criterion, x_{01} – the optimal value of the j-th criterion.

If the optimal value of the j-th criterion is unknown, then

$$x_{0j} = \max_i x_{ij}, if \ \max_i x_{ij} \ is \ preferable;$$
$$x_{0j} = \min_i x_{ij}^*, if \ \min_i x_{ij}^* \ is \ preferable \quad (2)$$

Phase 2: Normalization of criteria values

In this stage, the initial values of the criteria are normalised - by defining the values $\bar{x}_{ij}$of the normalised decision-making matrix - $\bar{X}$.

$$\bar{X} = \begin{bmatrix} \bar{x}_{01} & \cdots & \bar{x}_{0j} & \cdots & \bar{x}_{0n} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ \bar{x}_{i1} & \cdots & \bar{x}_{ij} & \cdots & \bar{x}_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ \bar{x}_{m1} & \cdots & \bar{x}_{mj} & \cdots & \bar{x}_{mn} \end{bmatrix}; i = \overline{0,m}; j = \overline{1,n} \quad (3)$$

Normalization in the case of the desired maximum value is performed as follows:

$$\bar{x}_{ij} = \frac{x_{ij}}{\sum_{i=0}^{m} x_{ij}} \quad (4)$$

If a minimum value is preferable, the procedure consists of two phases:

$$x_{ij} = \frac{1}{x_{ij}^*}; \ \bar{x}_{ij} = \frac{x_{ij}}{\sum_{i=0}^{m} x_{ij}} \quad (5)$$

Phase 3: Define the normalised-weighted matrix - $\hat{X}$

Weights are usually determined by the expert evaluation method. One should use only well-founded weights because they are always subjective and affect the solution. The sum of weights is limited (i.e. equal to 1):

$$\sum_{j=1}^{n} w_j = 1 \quad (6)$$

$$\hat{X} = \begin{bmatrix} \hat{x}_{01} & \cdots & \hat{x}x_{0j} & \cdots & \hat{x}_{0n} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ \hat{x}_{i1} & \cdots & \hat{x}_{ij} & \cdots & \hat{x}_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ \hat{x}x_{m1} & \cdots & \hat{x}_{mj} & \cdots & \hat{x}_{mn} \end{bmatrix}; i = \overline{0,m}; j = \overline{1,n} \quad (7)$$

The normalized-weighted values of the criteria are calculated as follows:

$$\hat{x}_{ij} = \bar{x}_{ij} w_j; i = \overline{0,m} \quad (8)$$

where is it w_j is the weight (importance) of the *j*-th criterion and $\bar{x}_{ij}$ j is the normalized rating of the *j*-th criterion.

Determining values of optimality function:

$$S_i = \sum_{j=1}^{n} \hat{x}_{ij};\ i = \overline{0,m} \quad (9)$$

where is it S_i is the value of the optimality function of the *i*-th alternative. If S_i is the largest, the criterion is the best.

The utility degree (K_i) of an alternative a_i is calculated (using the previous equation) as follows:

$$K_i = \frac{S_i}{S_0},\ i = \overline{0,m} \quad (10)$$

where S_i and S_0 are the optimality criterion values.

The value of K_i is in the interval $[0, 1]$. The relative efficiency (position, rank) of an alternative is determined according to the utility function values. The best alternative is the one with the greatest value.

In this paper, the weights of the criteria were determined using the AHP (Analytical Hierarchical Process) method. We will briefly point out its theoretical and methodological characteristics. The AHP method proceeds through several stages (Saaty, 2008):

Phase 1: Construct a pairwise comparison matrix

$$A = [a_{ij}] = \begin{bmatrix} 1 & a_{12} & \cdots & a_{1n} \\ 1/a_{12} & 1 & \cdots & a_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ 1/a_{1n} & 1/a_{2n} & \cdots & 1 \end{bmatrix} \quad (11)$$

Phase 2: Normalise the pairwise comparison matrix

$$a_{ij}^{*} = \frac{a_{ij}}{\sum_{i=1}^{n} a_{ij}}, i, j = 1, \ldots, n \quad (12)$$

Phase 3: Determination of relative importance, that is weight vector

$$w_i = \frac{\sum_{i=1}^{n} a_{ij}^{*}}{n}, i, j = 1, \ldots, n \quad (13)$$

A consistent index – CI is of particular importance. He is a measure of the deviation of *n* from λ_{max}. It can be represented by the following equation:

$$CI = \frac{\lambda_{max} - n}{n} \quad (14)$$

The meaning is as follows: If CI < 0.1, the estimated values of the coefficients a_{ij} are consistent, and the deviation of λ_{max} from *n* is negligible. In other words, this means that the AHP method accepts an inconsistency of less than 10%. The consistency index is used to calculate the consistency ratio CR = CI/RI, where RI is a random index.

RESULTS AND DISCUSSION

The selected criteria are financial indicators: C1 - Net profit, C2 - Business income, C3 - Business assets, C4 - Capital, and C5 - Number of employees. They are also key factors in the performance and efficiency of companies. With their adequate control, the company's target profit can be realized. Alternatives were observed (24) among largest companies in Serbia according to realized net profit in 2020. The initial data for measuring the efficiency of companies in Serbia are shown in Table 1. for 2020 using the AHP-ARAS method (Lukic, 2022). (The calculation was performed using the ARAS Software-Excel software.)

The weight coefficients of the selected criteria were determined using the AHP method (AHP With Arithmetic Mean Method). They are shown in Table 2. (The calculation was performed by using the AHP Software-Excel software.)

The empirical results of measuring the efficiency of companies in Serbia based on the ARAS method are shown in Tables 3-6 and Figure 1.

Table 1: Initial Data

	Companies	Net profit	Business income	Business assets	Capital	Number of employees
		C1	**C2**	**C3**	**C4**	**C5**
A1	TIGAR TIRES DOO PIROT	9,213	94,545	50,998	12.501	3,580
A2	COCA-COLA HBC - SERBIA DOO ZEMUN	5,668	26,649	49,349	41,272	962
A3	PHILIP MORRIS OPERATIONS AD NIŠ	4,861	23,786	27,506	16.201	595
A4	HEMOFARM AD VRŠAC	4,443	40,140	52,053	39,316	2,870
A5	FARMINA PET FOODS DOO INĐIJA	3,479	10,441	8,995	7,318	232
A6	DELHAIZE SERBIA DOO BELGRADE	3,931	111,485	72.196	42.305	12,889
A7	INVEJ AD BELGRADE-ZEMUN	3.402	125	6,867	120	54
A8	JT INTERNATIONAL AD SENTA	2,852	19,494	17.173	7,226	280
A9	KOEFIK DOO BELGRADE	2.174	157	3,423	2,991	16
A10	JP ROADS OF SERBIA BELGRADE	5.148	52.112	528.297	361.421	2,074
A11	IDC DOO BELGRADE	4.171	73,489	66,266	4.182	779
A12	DOO RZD INTERNATIONAL BRANCH BELGRADE	1.943	15,909	15.281	8,243	93
A13	DM INVEST DOO SMEDEREVSKA PALANKA	1,378	3,330	5,269	3.333	152
A14	INKOP DOO ĆUPRIJA	1.081	3.155	6,210	2,884	102
A15	TELENOR DOO BELGRADE	8.405	46,049	29,723	21,663	1.223
A16	TELEKOM SRBIJA AD BELGRADE	5,509	88.161	334.606	148.603	6,805
A17	VIP MOBILE DOO BELGRADE	3,606	33,599	49,532	0.000	1,350
A18	SBB DOO BELGRADE	3.282	27,857	65,021	24.134	1,655
A19	CETIN DOO BELGRADE	1.985	5,670	15,491	12,289	279
A20	JP EPS BELGRADE	12,883	282,731	913.683	609,792	24,478
A21	JKP BELGRADE ELEKTRANA BELGRADE	3.127	28,481	55,674	42.171	2010
A22	JP SRBIJAGAS NOVI SAD	2,990	87,228	204.195	121.019	934
A23	JUGOIMPORT-SDPR JP BELGRADE	1.286	14.162	56,310	21.129	363
A24	JP POST OF SERBIA BELGRADE	987	24,552	29,695	23,662	14,865
Statistics						
	Mean	45.1590	58.1260	110.9922	70.5690	204.7833
	Median	3.5425	31.0400	49.4405	21.3960	39.2390
	Std. Deviation	200.62977	63.69459	209.10842	138.90019	305.06081
	Skewness	4,898	2.178	3.063	3.163	1.632
	Std. Error of Skewness	.472	.472	.472	.472	.472
	Kurtosis	23,990	5,888	9,828	10,514	1.541
	Std. Error of Kurtosis	.918	.918	.918	.918	.918
	The minimum	1.08	3.16	3.42	.00	1.22
	Maximum	987.00	282.73	913.68	609.79	962.00

Note: Amounts in millions of dinars. Employees as an integer. Statistics were calculated by using SPSS software
Source: Agency for Economic Registers of the Republic of Serbia

Table 2: Weight of Criteria

Initial Comparisons Matrix	**C1**	**C2**	**C3**	**C4**	**C5**
C1	1	2.5	4	2	2
C2	0.4	1	6	1.25	1
C3	0.25	0.166667	1	0.5	1
C4	0.5	0.8	2	1	1
C5	0.5	1	1	1	1
SUM	2.65	5.46667	14	5.75	6

Normalized Matrix	**C1**	**C2**	**C3**	**C4**	**C5**	**Weights of Criteria**
C1	0.3774	0.4573	0.2857	0.3478	0.3333	0.3603
C2	0.1509	0.1829	0.4286	0.2174	0.1667	0.2293
C3	0.0943	0.0305	0.0714	0.0870	0.1667	0.0900
C4	0.1887	0.1463	0.1429	0.1739	0.1667	0.1637
C5	0.1887	0.1829	0.0714	0.1739	0.1667	0.1567
					SUM	**1**
Consistency Ratio	**0.0676**	**COMPARE WITH 0.1; IT SHOULD BE LESS THAN 0.1.**				

Table 3:Initial Matrix

Weights of criteria	0.3603	0.2293	0.09	0.1637	0.1567
Kind of criteria	1	1	1	1	1
	C1	**C2**	**C3**	**C4**	**C5**
A1	9,213	94,545	50,998	12.501	3.58
A2	5,668	26,649	49,349	41,272	962
A3	4,861	23,786	27,506	16.201	595
A4	4,443	40.14	52,053	39,316	2.87
A5	3,479	10,441	8,995	7,318	232
A6	3,931	111,485	72.196	42.305	12,889
A7	3.402	125	6,867	120	54
A8	2,852	19,494	17.173	7,226	280
A9	2.174	157	3,423	2,991	16
A10	5.148	52.112	528.297	361.421	2,074
A11	4.171	73,489	66,266	4.182	779
A12	1.943	15,909	15.281	8,243	93
A13	1,378	3.33	5,269	3.333	152
A14	1.081	3.155	6.21	2,884	102
A15	8.405	46,049	29,723	21,663	1.223
A16	5,509	88.161	334.606	148.603	6,805
A17	3,606	33,599	49,532	0	1.35
A18	3.282	27,857	65,021	24.134	1,655
A19	1.985	5.67	15,491	12,289	279
A20	12,883	282,731	913.683	609,792	24,478
A21	3.127	28,481	55,674	42.171	2.01
A22	2.99	87,228	204.195	121.019	934
A23	1.286	14.162	56.31	21.129	363
A24	987	24,552	29,695	23,662	14,865
MAX	987	282,731	913.683	609,792	962
MIN	1.081	3.155	3,423	0	1.223
0-Optimal Value	987	282,731	913.683	609,792	962

Table 4: Normalized Matrix

Weights of criteria	0.3603	0.2293	0.09	0.1637	0.1567
Kind of criteria	1	1	1	1	1
	C1	**C2**	**C3**	**C4**	**C5**
0-Optimal Value	0.4766	0.1685	0.2554	0.2647	0.1637
A1	0.0044	0.0564	0.0143	0.0054	0.0006
A2	0.0027	0.0159	0.0138	0.0179	0.1637
A3	0.0023	0.0142	0.0077	0.0070	0.1012
A4	0.0021	0.0239	0.0146	0.0171	0.0005
A5	0.0017	0.0062	0.0025	0.0032	0.0395
A6	0.0019	0.0664	0.0202	0.0184	0.0022
A7	0.0016	0.0745	0.0019	0.0521	0.0092
A8	0.0014	0.0116	0.0048	0.0031	0.0476
A9	0.0010	0.0936	0.0010	0.0013	0.0027
A10	0.0025	0.0311	0.1477	0.1569	0.0004
A11	0.0020	0.0438	0.0185	0.0018	0.1326
A12	0.0009	0.0095	0.0043	0.0036	0.0158
A13	0.0007	0.0020	0.0015	0.0014	0.0259
A14	0.0005	0.0019	0.0017	0.0013	0.0174
A15	0.0041	0.0274	0.0083	0.0094	0.0002
A16	0.0027	0.0525	0.0935	0.0645	0.0012
A17	0.0017	0.0200	0.0138	0.0000	0.0002
A18	0.0016	0.0166	0.0182	0.0105	0.0003
A19	0.0010	0.0034	0.0043	0.0053	0.0475
A20	0.0062	0.1685	0.2554	0.2647	0.0042
A21	0.0015	0.0170	0.0156	0.0183	0.0003
A22	0.0014	0.0520	0.0571	0.0525	0.1589
A23	0.0006	0.0084	0.0157	0.0092	0.0618
A24	0.4766	0.0146	0.0083	0.0103	0.0025

Table 5: Normalized Weighted Matrix

	C1	**C2**	**C3**	**C4**	**C5**
0-Optimal Value	0.1717	0.0386	0.0230	0.0433	0.0257
A1	0.0016	0.0129	0.0013	0.0009	0.0001
A2	0.0010	0.0036	0.0012	0.0029	0.0257
A3	0.0008	0.0033	0.0007	0.0012	0.0159
A4	0.0008	0.0055	0.0013	0.0028	0.0001
A5	0.0006	0.0014	0.0002	0.0005	0.0062
A6	0.0007	0.0152	0.0018	0.0030	0.0003
A7	0.0006	0.0171	0.0002	0.0085	0.0014
A8	0.0005	0.0027	0.0004	0.0005	0.0075
A9	0.0004	0.0215	0.0001	0.0002	0.0004
A10	0.0009	0.0071	0.0133	0.0257	0.0001
A11	0.0007	0.0100	0.0017	0.0003	0.0208
A12	0.0003	0.0022	0.0004	0.0006	0.0025
A13	0.0002	0.0005	0.0001	0.0002	0.0041
A14	0.0002	0.0004	0.0002	0.0002	0.0027
A15	0.0015	0.0063	0.0007	0.0015	0.0000
A16	0.0010	0.0120	0.0084	0.0106	0.0002
A17	0.0006	0.0046	0.0012	0.0000	0.0000
A18	0.0006	0.0038	0.0016	0.0017	0.0000
A19	0.0003	0.0008	0.0004	0.0009	0.0074
A20	0.0022	0.0386	0.0230	0.0433	0.0007
A21	0.0005	0.0039	0.0014	0.0030	0.0001
A22	0.0005	0.0119	0.0051	0.0086	0.0249
A23	0.0002	0.0019	0.0014	0.0015	0.0097
A24	0.1717	0.0034	0.0007	0.0017	0.0004

Table 6: Ranking

		S	K	K	Ranking
	0-Optimal Value	0.3023	1.0000	1.0000	
TIGAR TIRES DOO PIROT	**A1**	0.0168	0.0555	0.0555	12
COCA-COLA HBC - SERBIA DOO ZEMUN	**A2**	0.0345	0.1140	0.1140	5
PHILIP MORRIS OPERATIONS AD NIŠ	**A3**	0.0218	0.0721	0.0721	10
HEMOFARM AD VRŠAC	**A4**	0.0104	0.0345	0.0345	15
FARMINA PET FOODS DOO INĐIJA	**A5**	0.0090	0.0297	0.0297	18
DELHAIZE SERBIA DOO BELGRADE	**A6**	0.0211	0.0697	0.0697	11
INVEJ AD BELGRADE-ZEMUN	**A7**	0.0278	0.0920	0.0920	8
JT INTERNATIONAL AD SENTA	**A8**	0.0116	0.0383	0.0383	14
KOEFIK DOO BELGRADE	**A9**	0.0226	0.0746	0.0746	9
JP ROADS OF SERBIA BELGRADE	**A10**	0.0470	0.1556	0.1556	4
IDC DOO BELGRADE	**A11**	0.0335	0.1108	0.1108	6
DOO RZD INTERNATIONAL BRANCH BELGRADE	**A12**	0.0060	0.0197	0.0197	22
DM INVEST DOO SMEDEREVSKA PALANKA	**A13**	0.0051	0.0169	0.0169	23
INKOP DOO ĆUPRIJA	**A14**	0.0037	0.0122	0.0122	24
TELENOR DOO BELGRADE	**A15**	0.0101	0.0333	0.0333	16
TELEKOM SRBIJA AD BELGRADE	**A16**	0.0322	0.1064	0.1064	7
VIP MOBILE DOO BELGRADE	**A17**	0.0065	0.0215	0.0215	21
SBB DOO BELGRADE	**A18**	0.0078	0.0257	0.0257	20
CETIN DOO BELGRADE	**A19**	0.0098	0.0325	0.0325	17
JP EPS BELGRADE	**A20**	0.1079	0.3567	0.3567	2
JKP BELGRADE ELEKTRANA BELGRADE	**A21**	0.0089	0.0294	0.0294	19
JP SRBIJAGAS NOVI SAD	**A22**	0.0511	0.1690	0.1690	3
JUGOIMPORT-SDPR JP BELGRADE	**A23**	0.0148	0.0488	0.0488	13
JP POST OF SERBIA BELGRADE	**A24**	0.1779	0.5884	0.5884	1

Note: S_i is the value of the optimality function of the i-th alternative. The utility degree (K_i) of an alternative a_i.

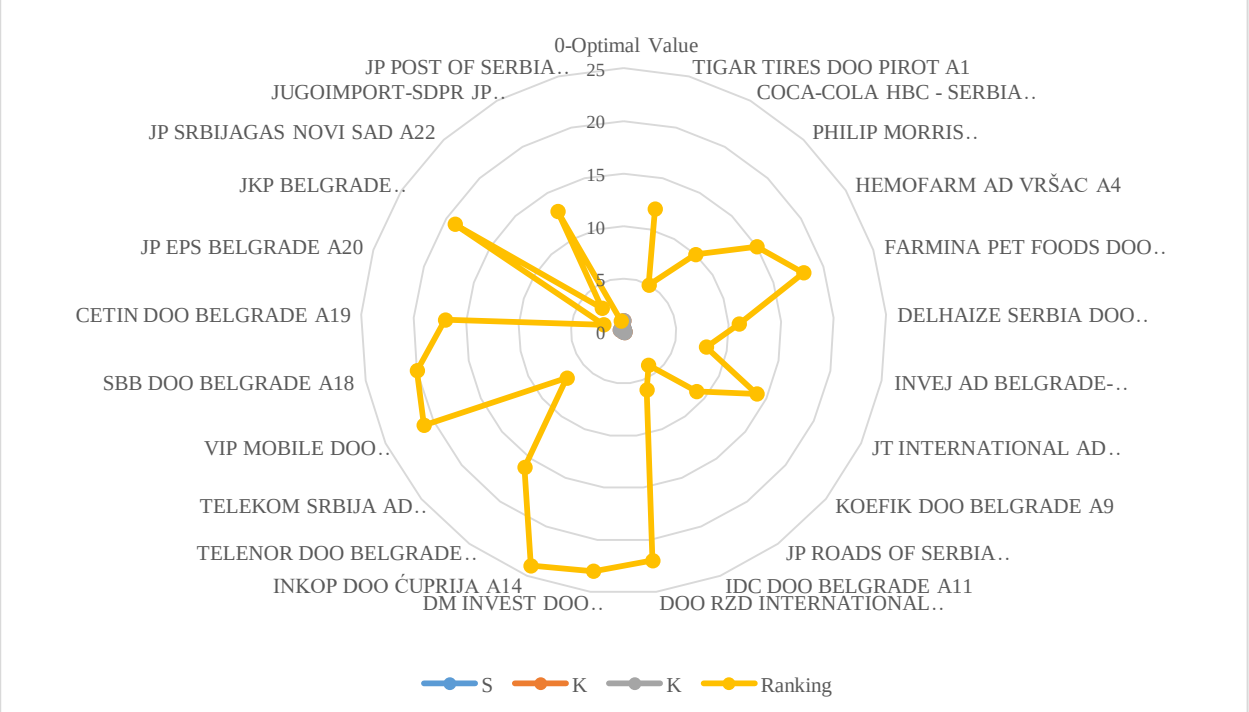

Figure 1: Ranking of companies in Serbia according to efficiency

Source: Author's picture

According to the ARAS method, five most efficient companies in Serbia in 2020 are JP POST OF SERBIA BELGRADE, JP EPS BELGRADE, JP SERBIAGAS NOVI SAD, JP PUTEVI SERBIA BELGRADE and COCA-COLA HBC - SERBIA DOO ZEMUN. First four are public companies, and the fifth is from the processing industry sector. Public enterprises are fundamentally efficient. The retail chain DELHAIZE SERBIA DOO BELGRADE is in the eleventh place. The trading company JUGOIMPORT-SDPR JP BELGRADE is in thirteenth place. Trading companies are therefore well positioned.

In this paper, the impact of profit management, asset sales, capital, and human resources management on the financial performance and efficiency of companies in Serbia was analyzed using the given methodology. With their adequate control, the target profit can be achieved. The obtained results of the research on the treated problem in this paper show that the tested hypothesis has been confirmed.

In addition to these factors, primarily of an internal nature, the financial performance and efficiency of companies in Serbia are also influenced by others of an external nature. In the strictest sense of the word, factors of efficiency of enterprises in Serbia are the growth rate of gross domestic product, interest rate, inflation, employment rate, foreign direct investments, the efficiency of enterprise management, digitization of the entire enterprise operation, application of new business models, application of new concepts of cost, sales and profit management. Effective control of these factors can achieve the company's target profit.

Similar research does not exist in the literature, which makes international comparison difficult.

Research of the financial performance and efficiency of companies in Serbia was mainly carried out using ratio analysis. In order to obtain a more complete picture of the financial situation and efficiency of companies in Serbia, it is recommended to simultaneously use ratio analysis and multi-criteria decision-making methods. The ARAS method provides a more realistic representation of the efficiency of companies in Serbia compared to ratio analysis. For these reasons, it is recommended, especially in combination with other methods of multi-criteria differentiation (TOPSIS, WASPAS, MARCOS, and others), as well as with DEA models.

CONCLUSION

In Serbia, five the most efficient companies are JP POST OF SERBIA BELGRADE, JP EPS BELGRADE, JP SERBIAGAS NOVI SAD, JP PUTEVI SERBIA BELGRADE, and COCA-COLA HBC - SERBIA DOO ZEMUN. First four are public companies. The fifth company is from the processing industry. Basically, public benefits are effective. The efficiency of business management in Serbia was influenced by numerous macro and micro factors: growth rate of gross domestic product, interest rate, inflation, employment rate, foreign direct investments, the efficiency of enterprise management, application of new business models, application of new concepts of cost, sales and profit management, digitization of the entire enterprise operation, etc. The impact of the Covid-19 pandemic, which has been mitigated to some extent with electronic business, is also not significant. The target profit can be achieved by their adequate control.

In the future, in order to achieve the target efficiency of companies in Serbia, it is necessary to manage human resources, assets, capital, sales, and profit as efficiently as possible. For these purposes, among other things, new concepts of cost management should be increasingly applied (calculation of costs by basic activities, target costs, activity management, and others).

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EVALUACIJA FINANSIJSKIH PERFORMANSI I EFIKASNOSTI SRPSKIH PREDUZEĆA

Sve se više u svetu u novije vreme koriste različite metode višekriterijumskog odlučivanja, kao i DEA (Data Envelopment Analysis) modeli, za merenje finansijskih performanasi i efikasnosti preduzeća. Polazeći od toga, u ovom radu se analizira efikasnost preduzeća u Srbiji korišćenjem ARAS metode. Prema ARAS metodi pet najefikasnijih preduzeća u Srbiji su JP POŠTA SRBIJE BEOGRAD, JP EPS BEOGRAD, JP SRBIJAGAS NOVI SAD, JP PUTEVI SRBIJE BEOGRAD i COCA-COLA HBC - SRBIJA DOO ZEMUN. Prva četiri su javna preduzeća, a peto je iz sektora prerađivačke industrije. Javna preduzeća su u osnovi efikasna. Trgovinska preduzeća su dobro pozicionirana. Tako, na primer, maloprodajni lanac DELHAIZE SERBIA DOO BEOGRAD je na jedanaestom mestu. Na pozicioniranje preduzeća u Srbiji u pogledu efikasnosti utacali su, pored makroekonomskih faktora, i upravljačke veštine rukovodstva u pogledu što efikasnijeg upravljanja aktivom, kapitalom, prodajom, profitom i ljudskim resursama, koje su svakako različite od jednog do drugog preduzeća. Značajnu ulogu u tome imala je i digitalizacija celokupnog poslovanja. Takođe je zabeležen i uticaj pandemije korona virusa Covid-19.

Ključne reči: ARAS metoda; Efikasnost; Faktori; Preduzeća; Srbija.