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# RESEARCH ON THE DYNAMICS OF THE PERFORMANCE POSITIONING OF THE TRADE IN SERBIA USING THE LOPCOW AND EDAS METHODS

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**Abstract:**
Researching the dynamics of the performance positioning of trade is a very challenging, continuously current, significant, and complex issue, especially in the conditions of the application of multi-criteria decision-making methods. Based on that, this paper investigates the dynamics of the performance positioning of trade in Serbia for the period 2017 - 2022 using the LAPCOW and EDAS methods. The results of this research show the following: Serbian trade, according to the obtained results of the research on the dynamics of performance positioning using the LOPCOW-EDAS method, was the best in 2022. The following are 2021, 2020, 2019, 2018 and 2017. Overall, the performance of trade in Serbia continuously improved. The factors that influenced the improvement of the dynamics of the performance positioning of trade in Serbia are geopolitical situation, economy, inflation, interest rate, employment, standard of living of the population, trade policy and strategy, foreign direct investments, new business models (multichannel sales - store and electronic, private label, sale of organic products, etc.), concept of sustainable development, energy crisis, management of human resources, asset, capital, sales and profit, digitisation of the entire business, and others. The target dynamics of the performance positioning of trade in Serbia can be achieved by effective control of these and other influential factors.

**Keywords:** performance, positioning, determinants, Serbian trade, LOPCOW-EDAS method

**JEL:** L81, M31, M41, O32

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## INTRODUCTION

Research on the performance positioning of trade is very challenging, continuously current, significant, and complex. It indicates what measures should be taken to improve the performance positioning of the trade in the future. In addition to financial analysis and statistical analysis, DEA models and multi-criteria decision-making methods play a significant role in this. This paper investigates the dynamics of the performance positioning of trade in Serbia using the LOPCOW and EDAS methods. The aim and purpose of this are to look at the dynamics of the performance positioning of trade in Serbia as realistically as possible and, in the context of that, propose adequate measures for improvement in the future.

As far as the literature is concerned, it is very rich in the world when it comes to the analysis of financial and business performance, efficiency, and positioning of companies from all economic sectors, which means trade as well ( Ersoy, 2017; Đalic et al., 2020; Kovač et al., 2021; Lalić, et al., 2021; Mikšić et al., 2021; Stankovič et al., 2020; Saaty, 2008; Trunkg, 2021; Senapati & Yager, 2020; Senapati & Yager, 2019a,b; Zavadskas et al., 2012. Zardari et al., 2014; Zardari et al., 2014; Zavadskas et al. 2012; Zavadskas et al., 2013a,b; Zavadskas , 2013a,b; Chakraborty & Zavadskas, 2014; Urosevic et al. , 2017). This is also the case with literature in Serbia ( Lukic & Hadrovic, 2019, 2021, 2022; Lukic & Kozarevic, 2021; Lukic, 2020; Lukic, 2021a,b,c,d; Lukic et al., 2020a,b; Lukic, 2022a,b,c,d,e,f,g,h, 2023a,b,c,d,e,f,g,h,i,j,k,l). In this paper, as far as we know, for the first time in the literature, the dynamics of the performance positioning of trade in Serbia is investigated using

the LOPCOW-EDAS method in the function of improvement in the future by applying relevant measures. In this, among other things, the scientific and professional contribution of this work to theory, methodology, and practice is manifested. The research hypothesis is based on the fact that only a continuous analysis of the dynamics of the performance positioning of trade in Serbia, based on modern methodology, provides a realistic basis for improvement in the future by applying adequate measures.

## 1. RESEARCH METHODS

Using the LOPCOW and EDAS methods, we will evaluate the factors of business and financial performance of trade in Serbia based on statistical data from the Agency for Economic Registers of the Republic of Serbia. In the following, we will present the basic characteristics of the given methods.

### LOPCOW method

LOPCOW (Logarithmic Percentage Change-driven Objective Weighting) method is one of the newer methods that is used to determine the weighting coefficients of the criteria as objectively as possible (Erce & Pamučar, 2022). The benefits of choosing the LOPCOW method are as follows: (1) a suitable solution is provided for the benefit and cost-oriented criteria without restrictions, (2) expressing the mean value of the squared value of the series as a percentage of their standard deviations, the differences caused by the size of the data are eliminated, (3) there are factors which do not affect it such as negative raw data, i.e. negative values. The steps for implementing the LOPCOW method are as follows (Erce & Pamučar, 2022; Demir & Riaz, 2023):

Step 1. Creating an initial decision matrix for a decision problem consisting of *m* alternatives and *n* criteria as follows:

$$X = \begin{bmatrix} x_{11} & \cdots & x_{1j} & \cdots & x_{1n} \\ \vdots & \vdots & \vdots & \ddots & \ddots \\ x_{m1} & \cdots & x_{mj} & \cdots & x_{mn} \end{bmatrix} \quad (1)$$

Step 2. Obtaining the normalised decision matrix (*R*)

The linear max-min normalisation technique is used for the elements of the normalised decision matrix. For cost-specific criteria, the following equation applies:

$$r_{ij} = \frac{x_{max} - x_{ij}}{x_{max} - x_{min}} \quad (2)$$

The following equation is used for beneficial specific criteria:

$$r_{ij} = \frac{x_{ij} - x_{min}}{x_{max} - x_{min}} \quad (3)$$

Step 3. Calculation of percentage values (PV) of criteria. The following equation is used to determine the percentage values of each criterion:

$$PV_{ij} = \left| ln \left[ \frac{\sqrt{\frac{\sum_{i=1}^{m} r_{ij}^2}{m}}}{\sigma} \right] \right| .100 \quad (4)$$

where σ the standard deviation represents the number of *m* alternatives.

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Step 4. Calculation of objective weights

The weight coefficients of each criterion are obtained using the following equation:

$$w_{ij} = \frac{PV_{ij}}{\sum_{i=1}^{n} PV_{ij}} \quad (5)$$

where the sum condition must be met $\left(\sum_{i=1}^{m} w_j = 1\right)$.

A Bayesian approach combining the LMAW and LOPCOW weights

The weight values obtained by both subjective weighting methods are combined using the equation below. In this way (i.e., based on the Bayesian approach), optimal values of the weight of the criteria are determined (Vinogradova et al., 2018). In the following equation, the criteria weights LMAW and LOPCOW are represented as $w_j^{LMAW}$ and, $w_j^{LOPCOW}$, respectively

$$w_j = \frac{w_j^{LMAW} . w_j^{LOPCOW}}{\sum_{j=1}^{m} w_j^{LMAW} . w_j^{LOPCOW}} \quad (6)$$

**EDAS method**

EDAS (Evaluation based on Distance from Average Solution) method is a new multi-criteria decision-making method (Keshavarz Ghorabaee et al., 2015). It is very useful when we have conflicting criteria. The choice of the best alternative is made according to the distance from the average solution (AV). There are two measures of desirability: (1) positive distance from the average (PDA), and (2) negative distance from the average (NDA). They show the difference between each (alternative) solution and the average solution. The assessment of the desirability of the alternatives is carried out according to higher values of PDA and lower values of NDA. A high value of PDA or a lower value of NDA indicates that the choice (alternative) is better than the average solution.

Suppose we have *n* alternatives and *m* criteria. The procedure of the EDAS method is as follows (Keshavarz Ghorabaee et al., 2015):

*Step 1*: Selection of the most important criteria that describe the alternatives.

*Step 2*: Formation of the decision matrix (*X*) as follows:

$$X = [X_{ij}]_{n\,x\,m} = \begin{bmatrix} X_{11} & X_{12} & \cdots & X_{1m} \\ X_{21} & X_{22} & \cdots & X_{2m} \\ \vdots & \vdots & \vdots & \vdots \\ X_{n1} & X_{n2} & \cdots & X_{nm} \end{bmatrix}, \quad (1)$$

where: *Xij* denotes the performance value of the *i* -th alternative about the *j* -th criterion.

*Step 3*: Determining the average solution according to all criteria as follows:

$$AV = [AV_j]_{1\,x\,m}, \quad (2)$$

wherein:

$$AV_j = \frac{\sum_{i=1}^{n} X_{ij}}{n}. \quad (3)$$

*Step 4*: Calculation of the positive distance from the average (*PDA*) and the negative distance from the average ( *NDA*) of the matrix according to the type of criteria (benefit and costs) as follows:

$$PDA = \left[[PDA_{ij}]\right]_{n\,x\,m}, \quad (4)$$

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$$NDA = \left[\left[NDA_{ij}\right]\right]_{n\,x\,m}. \qquad (5)$$

If the *j*-th criterion is beneficial:

$$PDA_{ij} = \frac{\max(0, (X_{ij} - AV_j))}{AV_j}, \qquad (6)$$

$$NDA_{ij} = \frac{max\ (0, (AV_j - X_{ij}))}{AV_j}, \qquad (7)$$

and if the *j*-th criterion is non-beneficial:

$$PDA_{ij} = \frac{\max(0, (AV_j - X_{ij}))}{AV_j}, \qquad (8)$$

$$NDA_{ij} = \frac{max\ (0, (X_{ij} - AV_j))}{AV_j}, \qquad (9)$$

where $PDA_{ij}$ and $NDA_{ij}$ denotes the positive and negative distances of the *i* -th alternative from the average solution in terms of the *j*-th criterion, respectively.

*Step 5*: Determining the weighted sum *of PDA* and *NDA* for all alternatives as follows:

$$SP_i = \sum_{j=1}^{m} w_j PDA_{ij}; \qquad (10)$$

$$SN_i = \sum_{j=1}^{m} w_j NDA_{ij}. \qquad (11)$$

where: $w_j$ the weight of the *j*-th criterion.

*Step 6*: Normalisation of *SP* and *SN* values for all alternatives as follows:

$$NSP_i = \frac{SP_i}{max_i(SP_i)}; \qquad (12)$$

$$NSN_i = 1 - \frac{SN_i}{max_i(SN_i)}. \qquad (13)$$

*Step 7*: Calculating the mean value (*AS*) for all alternatives as follows:

$$AS_i = \frac{1}{2}(NSP_i + NSN_i), \qquad (14)$$

Where in: $0 \leq AS_i \leq 1$.

*Step 8*: Ranking of alternatives according to descending mean value (*AS*). The alternative with the highest *AS* value is the best.

## 2. RESULTS AND DISCUSSION

Research on the dynamics of the performance positioning of trade in Serbia using the LOPCOW-EDAS method is based on the following criteria: C1 - Number of employees, C2 - Assets, C3 - Capital, C4 - Sales, C5 - Net profit, C6 - Assets per employee, C7 - Sales per employee, C8 - Net profit per employee, C9 - Asset turnover ratio, and C10 - Financial indebtedness. These criteria fully correspond to the nature of trade. They are a good measure of trading performance. The

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alternatives were analysed in the following years: A1 - 2017, A2 - 2018, A3 - 2019, A4 - 2020, A5 - 2021 and A6 - 2022. Table 1 shows the initial data.

**Table 1. Initial data**

| | | (I) Number of employees | (I) Assets | (I) Capital | (O) Sales | (A) Net profit | Assets per employee (assets/number of employees), in thousands of dinars | Sales per employee (sales/number of employees), in thousands of dinars | Net profit per employee (net profit/number of employees), in thousands of dinars | Asset turnover ratio (sales/asset) | Financial indebtedness (assets/equity) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 |
| A1 | 2017 | 208020 | 2375290 | 920992 | 3172393 | 122727 | 11418.57 | 15250.42 | 589.9769 | 1.335581 | 2.579056 |
| A2 | 2018 | 219373 | 2524897 | 1007972 | 3361094 | 121816 | 11509.61 | 15321.37 | 555.2917 | 1.331181 | 2.504928 |
| A3 | 2019 | 222049 | 2682931 | 1073056 | 3608329 | 139409 | 12082.61 | 16250.15 | 627.8299 | 1.344921 | 2.500271 |
| A4 | 2020 | 227618 | 2837599 | 1183026 | 3664505 | 171010 | 12466.5 | 16099.36 | 751.3026 | 1.29141 | 2.398594 |
| A5 | 2021 | 234727 | 3166529 | 1318126 | 4754169 | 170703 | 13490.26 | 20254.04 | 727.2406 | 1.501382 | 2.402296 |
| A6 | 2022 | 234011 | 3490398 | 1426553 | 5511864 | 214917 | 14915.53 | 23553.87 | 918.4055 | 1.579151 | 2.446736 |

*Source:* Agency for Economic Registers of the Republic of Serbia

*Note:* Data are expressed in millions of dinars. The number of employees is expressed as whole numbers. I – inputs. O – outputs. The calculation of ratio numbers is done by the author.

The weight coefficients of the criteria were determined using the LOPCOW method (Table 2). (In this paper, all calculations and results are the author's).

**Table 2. Weight coefficients of criteria**

| | c1 | c2 | c3 | c4 | c5 | c6 | c7 | c8 | c9 | c10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mak | mak | mak | mak | mak | mak | mak | mak | mak | min |
| A1 | 208020 | 2375290 | 920992 | 3172393 | 122727 | 11418.57 | 15250.42 | 589.9769 | 1.335581 | 2.579056 |
| A2 | 219373 | 2524897 | 1007972 | 3361094 | 121816 | 11509.61 | 15321.37 | 555.2917 | 1.331181 | 2.504928 |
| A3 | 222049 | 2682931 | 1073056 | 3608329 | 139409 | 12082.61 | 16250.15 | 627.8299 | 1.344921 | 2.500271 |
| A4 | 227618 | 2837599 | 1183026 | 3664505 | 171010 | 12466.5 | 16099.36 | 751.3026 | 1.29141 | 2.398594 |
| A5 | 234727 | 3166529 | 1318126 | 4754169 | 170703 | 13490.26 | 20254.04 | 727.2406 | 1.501382 | 2.402296 |
| A6 | 234011 | 3490398 | 1426553 | 5511864 | 214917 | 14915.53 | 23553.87 | 918.4055 | 1.579151 | 2.446736 |
| max | 234727 | 3490398 | 1426553 | 5511864 | 214917 | 14915.53 | 23553.87 | 918.4055 | 1.579151 | 2.579056 |
| min | 208020 | 2375290 | 920992 | 3172393 | 121816 | 11418.57 | 15250.42 | 555.2917 | 1.29141 | 2.398594 |

| | c1 | c2 | c3 | c4 | c5 | c6 | c7 | c8 | c9 | c10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mak | mak | mak | mak | mak | mak | mak | mak | mak | min |
| A1 | 0 | 0 | 0 | 0 | 0.009785 | 0 | 1 | 0.095522 | 0.84649 | 0 |
| A2 | 0.425095 | 0.134164 | 0.172046 | 0.08066 | 0 | 0.026034 | 0.991455 | 0 | 0.861782 | 0.410768 |
| A3 | 0.525293 | 0.275884 | 0.300783 | 0.18634 | 0.188967 | 0.189891 | 0.879601 | 0.199767 | 0.814031 | 0.436574 |
| A4 | 0.733815 | 0.414587 | 0.518303 | 0.210352 | 0.528394 | 0.299669 | 0.897761 | 0.539806 | 1 | 1 |
| A5 | 1 | 0.709563 | 0.785531 | 0.676126 | 0.525096 | 0.592426 | 0.397405 | 0.47354 | 0.270274 | 0.979486 |
| A6 | 0.973191 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0.733229 |

| | c1 | c2 | c3 | c4 | c5 | c6 | c7 | c8 | c9 | c10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mak | mak | mak | mak | mak | mak | mak | mak | mak | |
| A1 | 0 | 0 | 0 | 0 | 9.57E-05 | 0 | 1 | 0.009124 | 0.716546 | 0 | |
| A2 | 0.180705 | 0.018 | 0.0296 | 0.006506 | 0 | 0.000677771 | 0.982984 | 0 | 0.742668 | 0.16873 | |
| A3 | 0.275933 | 0.076112 | 0.09047 | 0.034722 | 0.035708 | 0.036058458 | 0.773697 | 0.039907 | 0.662646 | 0.190597 | |
| A4 | 0.538485 | 0.171882 | 0.268638 | 0.044248 | 0.2792 | 0.089801423 | 0.805974 | 0.29139 | 1 | 1 | |
| A5 | 1 | 0.503479 | 0.617059 | 0.457146 | 0.275726 | 0.350968557 | 0.15793 | 0.22424 | 0.073048 | 0.959393 | |
| A6 | 0.9471 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0.537625 | |
| Sum of squares | 2.942223 | 1.769473 | 2.005768 | 1.542622 | 1.590731 | 1.477506209 | 3.720586 | 1.564662 | 3.194908 | 2.856345 | |
| Squared mean | 0.700265 | 0.543058 | 0.578182 | 0.507054 | 0.5149 | 0.496236874 | 0.787463 | 0.510663 | 0.729716 | 0.689969 | |

| | c1 | c2 | c3 | c4 | c5 | c6 | c7 | c8 | c9 | c10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Standard Deviation | 0.413032 | 0.391743 | 0.397862 | 0.403875 | 0.383018 | 0.392098575 | 0.431804 | 0.381796 | 0.402042 | 0.427665 | |
| PV | 52.79325 | 32.66109 | 37.37829 | 22.75124 | 29.58892 | 23.5540106 | 60.08437 | 29.08245 | 59.60975 | 47.83061 | 395.334 |
| **w** | **0.133541** | **0.082616** | **0.094549** | **0.057549** | **0.074845** | **0.059580** | **0.151984** | **0.073564** | **0.150783** | **0.120988** | **1** |

Tables 3-8 show the calculations and results of the LOPCOW-EDAS method.

**Table 3. Initial matrix**

| Initial Matrix | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| weights of criteria | 0.133541 | 0.082616 | 0.094549 | 0.057549 | 0.074845 | 0.05958 | 0.151984 | 0.073564 | 0.150783 | 0.120988 |
| kind of criteria | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | **C1** | **C2** | **C3** | **C4** | **C5** | **C6** | **C7** | **C8** | **C9** | **C10** |
| **A1** | 208020 | 2375290 | 920992 | 3172393 | 122727 | 11418.57 | 15250.42 | 589.9769 | 1.335581 | 2.579056 |
| **A2** | 219373 | 2524897 | 1007972 | 3361094 | 121816 | 11509.61 | 15321.37 | 555.2917 | 1.331181 | 2.504928 |
| **A3** | 222049 | 2682931 | 1073056 | 3608329 | 139409 | 12082.61 | 16250.15 | 627.8299 | 1.344921 | 2.500271 |
| **A4** | 227618 | 2837599 | 1183026 | 3664505 | 171010 | 12466.5 | 16099.36 | 751.3026 | 1.29141 | 2.398594 |
| **A5** | 234727 | 3166529 | 1318126 | 4754169 | 170703 | 13490.26 | 20254.04 | 727.2406 | 1.501382 | 2.402296 |
| **A6** | 234011 | 3490398 | 1426553 | 5511864 | 214917 | 14915.53 | 23553.87 | 918.4055 | 1.579151 | 2.446736 |
| Average Solution | 224299.6667 | 2846274.0000 | 1154954.1667 | 4012059.0000 | 156763.6667 | 12647.1800 | 17788.2017 | 695.0079 | 1.3973 | 2.4720 |

**Table 4. Dij+**

| Dij+ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| weights of criteria | 0.133541 | 0.082616 | 0.094549 | 0.057549 | 0.074845 | 0.05958 | 0.151984 | 0.073564 | 0.150783 | 0.120988 |
| | **C1** | **C2** | **C3** | **C4** | **C5** | **C6** | **C7** | **C8** | **C9** | **C10** |
| **A1** | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0433 |
| **A2** | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0133 |
| **A3** | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0114 |
| **A4** | 0.0148 | 0.0000 | 0.0243 | 0.0000 | 0.0909 | 0.0000 | 0.0000 | 0.0810 | 0.0000 | 0.0000 |
| **A5** | 0.0465 | 0.1125 | 0.1413 | 0.1850 | 0.0889 | 0.0667 | 0.1386 | 0.0464 | 0.0745 | 0.0000 |
| **A6** | 0.0433 | 0.2263 | 0.2352 | 0.3738 | 0.3710 | 0.1794 | 0.3241 | 0.3214 | 0.1302 | 0.0000 |

**Table 5. Dij-**

| DJ- | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| weights of criteria | 0.133541 | 0.082616 | 0.094549 | 0.057549 | 0.074845 | 0.05958 | 0.151984 | 0.073564 | 0.150783 | 0.120988 |
| | **C1** | **C2** | **C3** | **C4** | **C5** | **C6** | **C7** | **C8** | **C9** | **C10** |
| **A1** | 0.0726 | 0.1655 | 0.2026 | 0.2093 | 0.2171 | 0.0971 | 0.1427 | 0.1511 | 0.0442 | 0.0000 |
| **A2** | 0.0220 | 0.1129 | 0.1273 | 0.1623 | 0.2229 | 0.0899 | 0.1387 | 0.2010 | 0.0473 | 0.0000 |
| **A3** | 0.0100 | 0.0574 | 0.0709 | 0.1006 | 0.1107 | 0.0446 | 0.0865 | 0.0967 | 0.0375 | 0.0000 |
| **A4** | 0.0000 | 0.0030 | 0.0000 | 0.0866 | 0.0000 | 0.0143 | 0.0949 | 0.0000 | 0.0758 | 0.0297 |
| **A5** | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0282 |
| **A6** | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0102 |

**Table 6. PDA**

| PDA | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **C1** | **C2** | **C3** | **C4** | **C5** | **C6** | **C7** | **C8** | **C9** | **C10** | **Qi+** | **Si+** |
| **A1** | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0052 | 0.0052 | 0.0263 |
| **A2** | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0016 | 0.0016 | 0.0081 |
| **A3** | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0014 | 0.0014 | 0.0070 |
| **A4** | 0.0020 | 0.0000 | 0.0023 | 0.0000 | 0.0068 | 0.0000 | 0.0000 | 0.0060 | 0.0000 | 0.0000 | 0.0170 | 0.0855 |
| **A5** | 0.0062 | 0.0093 | 0.0134 | 0.0106 | 0.0067 | 0.0040 | 0.0211 | 0.0034 | 0.0112 | 0.0000 | 0.0858 | 0.4309 |
| **A6** | 0.0058 | 0.0187 | 0.0222 | 0.0215 | 0.0278 | 0.0107 | 0.0493 | 0.0236 | 0.0196 | 0.0000 | 0.1992 | 1.0000 |
| | | | | | | | | | | **MAX** | 0.1992 | |

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**Table 7. NDA**

| NDA | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | Qi- | Si- |
| A1 | 0.0097 | 0.0137 | 0.0192 | 0.0120 | 0.0163 | 0.0058 | 0.0217 | 0.0111 | 0.0067 | 0.0000 | 0.1161 | 0.0000 |
| A2 | 0.0029 | 0.0093 | 0.0120 | 0.0093 | 0.0167 | 0.0054 | 0.0211 | 0.0148 | 0.0071 | 0.0000 | 0.0987 | 0.1498 |
| A3 | 0.0013 | 0.0047 | 0.0067 | 0.0058 | 0.0083 | 0.0027 | 0.0131 | 0.0071 | 0.0056 | 0.0000 | 0.0554 | 0.5224 |
| A4 | 0.0000 | 0.0003 | 0.0000 | 0.0050 | 0.0000 | 0.0009 | 0.0144 | 0.0000 | 0.0114 | 0.0036 | 0.0355 | 0.6938 |
| A5 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0034 | 0.0034 | 0.9706 |
| A6 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0012 | 0.0012 | 0.9894 |
| | | | | | | | | | | MAX | 0.1161 | |

**Table 8. Ranking**

| | Si | Si | RANKING |
|---|---|---|---|
| 2017 | 0.013 | **0.013** | **6** |
| 2018 | 0.079 | **0.079** | **5** |
| 2019 | 0.265 | **0.265** | **4** |
| 2020 | 0.390 | **0.390** | **3** |
| 2021 | 0.701 | **0.701** | **2** |
| 2022 | 0.995 | **0.995** | **1** |

Therefore, according to the results of the research on the dynamics of performance positioning using the LOPCOW-EDAS method, Serbia's trade was the best in 2022. The following are 2021, 2020, 2019, 2018, and 2017. So, the performance of Serbia's trade has continuously improved. Effective control of key factors contributed to this, such as geopolitical situation, economic climate, inflation, interest rate, foreign direct investments, unemployment, living standards of the population, the concept of sustainable development, energy crisis, the Covid-19 pandemic, new business models (multichannel sales – store and electronic, private label, sale of organic products, etc.), digitisation of the entire business, and others. The effective management of human resources, assets, capital, sales, costs, and profit also had a significant impact on the dynamics of market positioning in Serbia. The application of new cost management concepts (calculation by activities, target costs, activity management, etc.), product category management, and customer management, have a positive effect on the profit of trade in Serbia.

To obtain as realistic a picture as possible of the dynamics of the performance positioning of trade in Serbia, it is recommended that, in addition to the LOPCOW-EDAS method, other developed multi-criteria decision-making methods (LMAW, WASPAS, DOBI, MARCOS, COPRAS, etc.) are also used in comparison.

## 4. CONCLUSION

Research on the dynamics of the performance positioning of trade in Serbia using the LOPCOW-EDAS method provides an adequate theoretical, methodological, and empirical basis for the following conclusion: according to the results of the research on the dynamics of the performance positioning of trade in Serbia in the period 2017 - 2022, using the LOPCOW-EDAS method, the best ranking was achieved in 2022 Next: 2021, 2020, 2019, 2018 and 2017. The performance of the Serbian trade has continuously improved. This was achieved by effective control of key factors (geopolitical situation, economic climate, inflation, interest rate, foreign direct investments, unemployment, living standards of the population, the concept of sustainable development, the energy crisis, the Covid-19 coronavirus pandemic, new business models (multichannel sales - store and electronic, private label, sale of organic products, etc.), digitisation of the entire business, and others). Effective management of human resources, assets, capital, sales, costs, and profit also influenced the dynamics of the market's performance positioning in Serbia. The application of new concepts of cost management (accounting by activities, target costs, activity management, etc.),

product category management, and customer management has a positive impact on the profit of trade in Serbia. All in all, the performance position of trade in Serbia is satisfactory.

It is recommended that to obtain as realistic an idea as possible about the dynamics of the performance positioning of trade in Serbia, in addition to the LOPCOW-EDAS method, other developed multi-criteria decision-making methods (LMAW, WASPAS, DOBI, MARCOS, COPRAS, etc.) are used in comparison.

## AUTHORS CONTRIBUTIONS

The author/authors listed have made a substantial, direct, and intellectual contribution to the work, and approved it for publication.

## CONFLICT OF INTEREST STATEMENT

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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