

Evaluation of Performances of Automotive Sector Companies Traded in BIST, Including the COVID-19 Pandemic Period, with TOPSIS, ELECTRE and CRITIC Methods

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Abstract

It is known that financial performance is one of the most important criteria for company evaluations. While the financial performance evaluations of companies operating in different sectors can be evaluated under different criteria, it is possible to evaluate the financial performance of companies operating in the same sector using certain financial ratios. When Türkiye's export items are analyzed, it is seen how important the Automotive sector, which is one of the most important income items, is for the country. In this study, performance evaluations of 8 companies traded in this sector on BIST, including the COVID-19 pandemic period, were made using Multi-Criteria Decision Making Methods, based on their 2017-2021 year-end financials and 5-year average financial data. A total of 13 financial ratios, consisting of liquidity ratios, activity ratios, financial structure and ratios, and profitability ratios, were used in performance evaluations. Criteria weights of financial ratios were determined using the CRITIC method over 5-year average data. Performance evaluations of companies were made using TOPSIS and ELECTRE methods. The results were visualized using Bilateral Superiority Graph. Considering the 5-year period, according to TOPSIS and ELECTRE, while all companies passed the process successfully, the most successful companies were seen as DOAS, TTRAK and FROTO.

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1. Introduction

The COVID-19 pandemic has deeply affected all economies in the world and the effect of the pandemic on countries in the economic and political framework still continues. It was observed that global enterprises adapted to the process relatively faster, but some sectors suffered from serious supply cuts. In the automotive sector, recommendations were made to increase domestic production as a solution.

In developing countries such as Türkiye, reactions to global crises such as pandemics may be more severe. The main reason for this is the high economic fragility. The main problem in developing countries that need foreign investors is that in a global crisis such as a pandemic, foreign investors are more offensive and reduce their investment or withdraw completely.

The most important economic item for countries is growth. Economic growth means the increase in the gross domestic product of the country. One of the important indicators of the country's growth is the change in export values. In other words, the main focus in developing countries like Türkiye is to ensure a healthy increase in exports.

The automotive sector has been one of the most important items in Türkiye's exports for years. The idea of how the performance of this sector during the pandemic process is realized is the main focus of this study.

The names of the companies used in the study and their symbols in BIST (Borsa İstanbul) are shown in Table 1. The 2017-2021 year-end financial reports of the companies were evaluated with Multi-Criteria Decision Making methods, taking into account both annual and 5-year averages. In the study prepared by considering 13 criteria, criterion weights were determined using the CRITIC (Criteria Importance Through Intercriteria Correlation) method. Evaluations in the study were made with TOPSIS (Technique for Order of Preference by Similarity to Ideal Solution) and ELECTRE (Elimination and Choice Translating Reality) methods.

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Table 1. Company names and symbols

Companies	Symbols
Anadolu Isuzu Otomotoiv San. ve Tic. A. Ş.	ASUZU
Doğuş Otomotiv Servis ve Ticaret A. Ş.	DOAS
Ford Otomotiv San. A. Ş.	FROTO
Karsan Otomotiv San. ve Tic. A. Ş.	KARSN
Otokar Otomotiv ve Savunma San. A. Ş.	OTKAR
Tümosan Motor ve Traktör San. A. Ş.	TMSN
Tofaş Türk Otomobil Fabrikası A. Ş.	TOASO
Türk Traktör ve Ziraat Makineleri A. Ş.	TTRAK

2. Literature Review

When past studies are examined, there are many financial performance evaluations made using Multi-Criteria Decision Making Methods on BIST data.

Portfolio diversification was made with TOPSIS and Gray relational analysis methods, one of the quarterly financials of companies in 3 different sectors in the BIST for the years 2015-2019 (Tekin and Keskin, 2021). The financial performances of five companies operating in the petroleum sector in the BIST for the years 2011-2017 were evaluated using the TOPSIS method and in this study, a total of 8 financial ratios, namely current ratio, liquidity ratio, cash ratio, debt ratio, assets turnover ratio, return on sales ratio, return on equity and return on assets, were used (Ergül, 2018). Financial performance rankings of BIST foreign trade capital companies and companies included in the sustainability index for the years 2013-2017 were made using the TOPSIS method and in this study, a total of 9 financial ratios, namely stock turnover ratio, assets turnover ratio, fixed assets turnover ratio, liquid assets turnover ratio, asset profitability, equity profitability, profit per share, price/earnings and profit margin, were used (Karaca, S. and Karaca, A., 2018). Financial performance evaluations of tourism companies traded on the BIST were made using TOPSIS (Yılmaz and Aslan, 2017; Karakaş and Öztel, 2020). In a similar study, after the weights of financial ratios were determined using the CRITIC method, the financials of the tourism sector for the years 2014-2018 were evaluated using the TOPSIS method and 11 financial ratios were used in this study (Aytekin, 2019). In another similar study, the financials of companies in the tourism sector for the years 2018-2020 were evaluated with TOPSIS and VIKOR methods and 20 financial ratios were used in this study (Türegün, 2022). The financial performances of 6 companies in the BIST Construction sector for 2011, which is one of the continuation periods of 2008, which caused a global crisis such as COVID-19, were evaluated by TOPSIS and ELECTRE methods and in this study, a total of 8 financial ratios, namely current ratio, liquidity ratio, asset turnover ratio, financial leverage ratio, return on assets, return on equity, return on sales and operatinh profitability, were used (Keskin, Ulas and Koc, 2016). Financial performance evaluations of companies in the chemical, petroleum and plastics sectors in the BIST for the years 2010-2012 were made with AHP and TOPSIS (Öztürk and Özçelik, 2015), AHP was used for criterion weights of financial ratios in the same sector. VIKOR, TOPSIS, GRA and MOORA were used for 2015 financial performance evaluations (Karaoğlu and Şahin, 2018). 2015 financial performance evaluations of 6 electricity generation companies traded on the BIST were made with TOPSIS and 12 financial ratios were used in this study (İlkuçar and Çifci, 2016). Performance evaluations of companies operating in the BIST Tourism sector for the years 2005-2012 were made with ELECTRE and TOPSIS (Ergül, 2014). The 2013-2016 financial performances of 5 Food and Beverage companies traded in the BIST XKURY index were analyzed using the TOPSIS method (Yıldırım, Altan and Gemici, 2018). The 2016-2019 financial performance rankings of Electricity, Gas and Steam companies traded on the BIST were made using the TOPSIS method (Kendirli, Çitak and İşleyen, 2021). The financial performances of 18 companies in the BIST Metal Goods, Machinery index for the years 2010-2012 were analyzed using the TOPSIS method in terms of the effects of the 2008 crisis (Topaloğlu, 2014). The financial performances of companies in the insurance sector for the years 2012-2016 were evaluated using the TOPSIS method using 10 financial ratios. In this study, criterion weights were determined by entropy (Akbulut and Rençber, 2015). The financial performances of companies in the insurance sector for the years 2012-2016 were evaluated using the TOPSIS method. In this study, 10 financial ratios were used and criterion weights were determined by the entropy method (Altan and Yıldırım, 2019). The financial performances of the companies in the BIST 30 index for the years 2010-2014 were analyzed using the TOPSIS method (Temizel and Bayçelebi, 2016). The financial performances of companies in the manufacturing sector covering the years 2014-2016 were evaluated with the TOPSIS method using 19 financial ratios. In this study, criterion weights were determined by AHP (Eyüboğlu and Bayraktar, 2018). The financials of 7 banks operating in Türkiye covering the years 2014-2018 were evaluated using TOPSIS and Fuzzy TOPSIS methods (Ünvan, 2020). The financial performances of 14 companies in the Paper and Paper Products Printing and Publishing sector traded on the BIST, covering the years 2012-2017, were evaluated with TOPSIS, PROMETHEE and COPRAS methods using 10 financial ratios (Akyüz, Yeşil, İsmail and Ersoy, 2018). In order to

examine the financial failures of the companies in the food and beverage sector traded on the BIST, the financials of 2008-2014 were examined with multi-criteria decision making methods and the VIKOR method was suggested as an alternative method in failure analysis (Apan, Oztel and Islamoglu, 2018). Quarterly financial evaluations of the food companies traded in the BIST Star Market for the years 2018 – 2021, covering the COVID-19 periods, were made using the TOPSIS method (Kondak, 2021). Financial performance evaluation in the airline industry was made using the TOPSIS method (Ömürbek, 2013). The financial performances of 11 energy sector companies traded on the BIST for the period 2010-2015 were evaluated using TOPSIS and MOORA methods (Metin, Yaman and Korkmaz, 2017). The 2014-2017 financials of 20 of the Weaving, Clothing and Leather companies in the BIST were evaluated using the TOPSIS method using 11 financial ratios (Işıldak, 2018). The financial performance evaluations of 22 banks traded on the BIST for the years 2009-2018 were made using TOPSIS and VIKOR methods by choosing 26 criteria. The criterion weights were determined by entropy in this study (Yılmaz and Yakut, 2021). 2011-2015 financial performance evaluations of 11 automotive manufacturing sector companies included in BIST-100 were made using TOPSIS, VIKOR and ELECTRE methods by determining their criterion weights with AHP. 9 financial ratios were used in this study (Yanık and Tamer, 2017). The financial performances of 14 energy companies traded on the BIST in 2010-2014 were made using the TOPSIS method (Sakarya, Yıldırım and Akkuş, 2015). The financial performances of 8 transportation companies traded on the BIST in 2014-2018 were evaluated by TOPSIS and PROMETHEE methods (Ceren and Kıpık, 2019). The 2015-2019 financials of 11 automotive manufacturing companies traded on the BIST were analyzed using the TOPSIS method. 10 financial ratios were used in this study (Kendirli and Yıldırım, 2022). Financial performance evaluations of brokerage houses traded on the BIST for the years 2014 and 2015 were made using ELECTRE, ORESTE and TOPSIS methods (Günay and İzzet, 2017).

When the studies in the literature were examined, it was seen that there were very few studies showing the financial impact of the COVID-19 process on the sectors. In this study, how the automotive sector, one of Türkiye's most important export items, spent the COVID-19 pandemic process was discussed and visual results were presented using Bilateral Superiority Graphs. In this way, it is thought to be among the important studies in the literature.

3. Financial Ratios

Financial ratios are used for many purposes in terms of company analysis. These ratios are the most important factor in evaluating a company's ability to pay its debts.

In this study, 13 financial ratios were used under 4 main headings.

3.1. Liquidity Ratios

The Liquidity Ratio is a ratio that measures the company's ability to meet its short-term obligations.

Current Ratio is a liquidity ratio used to compare current assets with current liabilities. It is generally accepted that the higher the ratio, the more likely the company will be able to pay its short-term obligations, thereby attracting investors to purchase the company's shares.

The Liquidity (Acid-test) Ratio is the ratio that measures the extent to which current assets can meet short-term debts without considering stocks.

Cash Ratio shows the company's ability to pay short-term debts with the cash in hand instantly.

3.2. Activity Ratios

Asset Turnover Rate is the ratio that measures the number of times the firm's assets are converted to sales during the year. When calculating the ratio, the net sales of the firm are proportioned to its assets.

Current Asset Turnover Rate is the ratio that measures the percentage of the firm's current assets turned into sales during the year. The ratio is calculated by dividing current assets by net sales.

3.3. Financial Structure and Ratios

Financial Leverage Ratio is the most basic evaluation method that shows how much of the firm's assets are financed by debt.

Equity Ratio is the ratio that shows how much the company funds its balance sheet with its own resources. It is understood that the higher the Equity's Asset funding, the less the firm's loan need.

Financing Ratio is found by dividing the company's own resources to total foreign resources.

The Current Liabilities Ratio shows the ratio of the company's current liabilities to its balance sheet. Whether the company has a healthy balance sheet structure is directly related to the maturity structure of its debts.

3.4. Profitability Ratios

The return on assets ratio is the ratio that shows how much profit the company's assets have turned into.

Return on equity is the ratio that shows how much profit the company's own resources have turned into in 1 year.

4. Methods And Findings

In the study, CRITIC method was used to determine criterion weights, and TOPSIS and ELECTRE methods were used for performance evaluations. The evaluations of the methods used in the study were made with R.

4.1. CRITIC Method

The CRITIC method is a method introduced in 1995 to determine the weights unbiasedly in multi-criteria decision making methods (Diakoulaki, Mavrotas and Papayannakis, 1995). The steps of the method are as follows (Žižović, Miljković and Marinković, 2020).

a) The element of the first decision matrix is normalized and the normalized matrix $X = [\xi_{ij}]_{m \times n}$ is created. Equation (1) is used to maximize the criteria.

$$\xi_{ij} = \frac{\xi_{ij} - \xi_j^{\min}}{\xi_j^{\max} - \xi_j^{\min}}, i = 1, 2, \dots, n; j = 1, 2, \dots, m \quad (1)$$

Equation (2) is used to minimize the criteria.

$$\xi_{ij} = \frac{\xi_j^{\max} - \xi_{ij}}{\xi_j^{\max} - \xi_j^{\min}}, i = 1, 2, \dots, n; j = 1, 2, \dots, m \quad (2)$$

In this equation $\xi_j^{\max} = \max_j \{\xi_{1j}, \xi_{2j}, \dots, \xi_{mj}\}$; $\xi_j^{\min} = \min_j \{\xi_{1j}, \xi_{2j}, \dots, \xi_{mj}\}$.

all ξ_{ij} elements are reduced to [0, 1] range values, so it can be said that all criteria have the same metrics.

b) For the $C_j (j = 1, 2, \dots, n)$ criterion, the σ_j standard deviation is defined. σ_j represents the measure of deviation of the values of the alternatives for the given mean value criterion. The standard deviation of a given criterion is the measure taken into account in the subsequent process of defining criterion weighting coefficients.

c) The W_j matrix is expressed as:

$$W_j = \sigma_j \cdot \varphi_j = \sigma_j \sum_{k=1}^n (1 - l_{kj}) \quad (3)$$

It is concluded that a higher W_j value means a larger amount of data from a given criterion. This situation increases the relative importance of the criterion for the decision process. Here, l_{kj} represents the linear correlation coefficients of ξ_j and ξ_k , which are the vectors of the j and k criteria.

d) The objective criterion weights are obtained by the normalization measure W_j .

$$w_j = \frac{W_j}{\sum_{k=1}^m W_k} \quad (4)$$

Here it is recommended to calculate criterion weights based on standard deviation vectors (Diakoulaki, Mavrotas and Papayannakis, 1995).

$$w_j = \frac{\sigma_j}{\sum_{k=1}^m \sigma_k} \quad (5)$$

The financial ratios used in the study and given in Table 2 have been determined by taking into account the previous studies in the automotive sector. The weights of the criteria were obtained using the CRITIC method over 5-year average data.

Table 2: Financial ratios and values

RATIOS			Benefit/Cost	Weights (100)
I. Liquidity Ratios				
1	Current Ratio	Current Assets / Short Term Liabilities	Max	8.0897
2	Liquidity Ratio	(Current Assets-Inventories) / Short Term Liabilities	Max	7.8032
3	Cash Ratio	Liquid Assets / Short Term Liabilities	Max	7.1977
II. Activity Ratios				
4	Receivable Turnover Ratio	Net Sales / Trade Receivables	Max	7.0583
5	Total Assets Turnover Ratio	Net Sales / Total Assets	Max	8.0904
6	Current Asset Turnover Ratio	Net Sales / Current Assets	Max	8.2598
III. Financial Structure and Ratios				
7	Financial Leverage Ratio	Total Debt / Total Assets	Min	6.8640
8	Equity Ratio	Equity / Total Assets	Max	6.8640
9	Financing Ratio	Equity / Total Liabilities	Max	7.1913
10	Short Term Liabilities Ratio	Short Term Liabilities / Total Assets	Min	7.3052
11	Long Term Liabilities Ratio	Long Term Liabilities / Total Assets	Min	8.4357
IV. Profitability Ratios				
12	Active Profitability Ratio	Net Profit / Total Assets	Max	8.5818
13	Return on Equity Ratio	Net Profit / Equity	Max	8.2589

4.2. ELECTRE Method

ELECTRE methods were developed based on Roy's decision aid philosophy (Roy, 1996).

The steps of the method are as follows (Rivensin and Jollyta, 2021).

a) The normalization value n_{ij} is calculated as follows.

$$n_{ij} = \frac{x_{ij}}{\sum_{i=1}^m x_{ij}^2} \quad (6)$$

Here, alternative i represents the j criterion, while m represents the alternative.

b) The weighted normalized value y_{ij} is calculated as follows.

$$y_{ij} = w_i n_{ij} \quad (7)$$

c) If there is harmony in a criterion in the alternative, $k, l=1, 2, \dots, m$ and $k \neq l$, it is determined by the equation below.

$$C_{kl} = \{j \mid y_{kj} \leq y_{lj}\}, j=1, 2, \dots, n. \quad (8)$$

d) The Concordance matrix is calculated as follows.

$$C_{kl} = \sum_{j \in C_{kl}} W_j \quad (9)$$

The calculation of the Discordance matrix is as follows.

$$d_{kl} = \frac{\max\{|v_{kj} - v_{lj}|\} j \in d_{kl}}{\max\{|v_{kj} - v_{lj}|\} \forall j} \quad (10)$$

e) The dominant Concordance matrix is calculated as follows.

$$C = \frac{\sum_{k=1}^n \sum_{l=1}^n c_{kl}}{m(m-1)} \quad (11)$$

The dominant Discordance matrix is calculated as follows.

$$D = \frac{\sum_{k=1}^n \sum_{l=1}^n d_{kl}}{m(m-1)} \tag{12}$$

f) The dominant sum matrix e is determined as follows.

$$e_{kl} = f_{kl} \times g_{kl} \tag{13}$$

The result of matrix e from this equation gives the selection order for each alternative choice. It is also possible to show the binary relations with the help of arrows according to the row column values from the total dominance matrix.

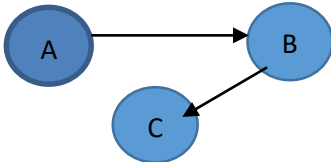


Figure 1. Bilateral Superiority Graph

In double superiority representations, the side where the arrow comes out shows the superior one. Considering the illustration in Figure 1, it is understood that while A is superior to B and B is superior to C, there is no superiority relationship between A and C.

Annual and 5-year average results resulting from the application of the ELECTRE method were shown in Tables 3-8, respectively. In addition, after each table, the bilateral superiority Graphs created according to the results of that period were shown in Figures 2-7.

Table 3: Net Concordance/Discordance Supremacy Matrices

Companies	Concordance	Discordance	Concordance Rank	Discordance Rank	Average Rank
ASUZU	-1.520224	3.466711618	6	7	6.5
DOAS	-0.547849	-0.029048111	5	5	5
FROTO	2.1130629	-3.707558394	2	1	1
KARSN	-2.983422	4.618540039	8	8	8
OTKAR	-2.554218	2.055577736	7	6	6.5
TMSN	1.7839304	-2.380021713	3	2	2.5
TOASO	1.0005655	-2.038741402	4	3	4
TTRAK	2.7081548	-1.985459772	1	4	2.5

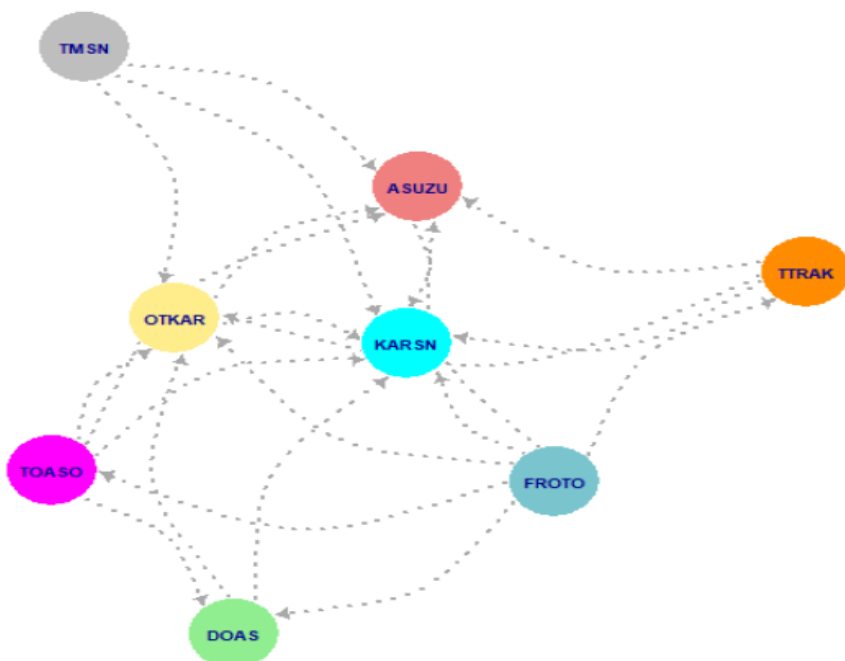


Figure 2. Bilateral Superiority Graph for 2017



Figure 4. Bilateral Superiority Graph for 2019



Figure 5. Bilateral Superiority Graph for 2020

Table 7: Net Concordance/Discordance Supremacy Matrices

Companies	Concordance	Discordance	Concordance Rank	Discordance Rank	Average Rank
ASUZU	0.0787213	2.064055044	4	6	4.5
DOAS	3.7593124	-5.963868697	1	1	1
FROTO	1.1723826	-1.478465989	3	3	3
KARSN	-4.265813	5.55224685	8	8	8
OTKAR	-1.220397	2.242218385	6	7	7
TMSN	-0.51869	1.150652306	5	5	4.5
TOASO	-1.794361	0.104638595	7	4	6
TTRAK	2.7888451	-3.671476493	2	2	2

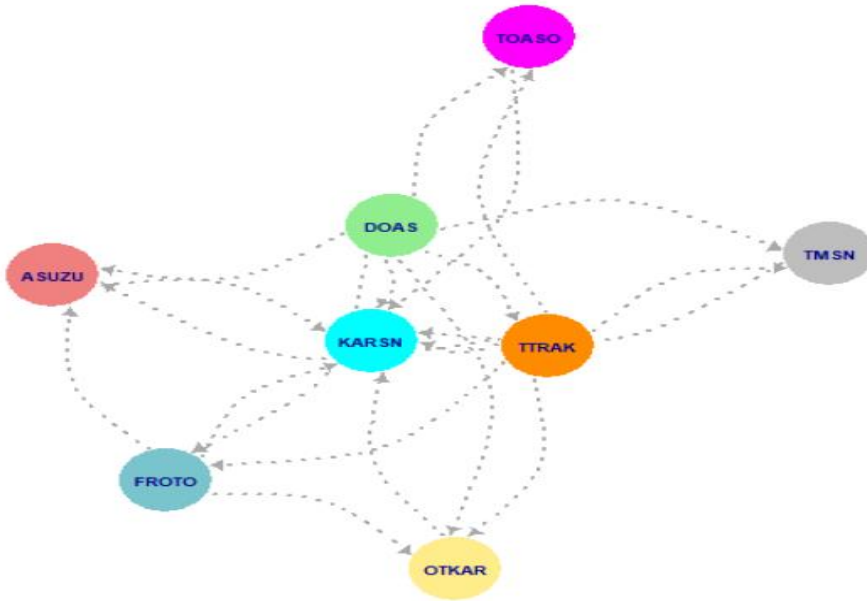


Figure 6. Bilateral Superiority Graph for 2021

Table 8: Net Concordance/Discordance Supremacy Matrices

Companies	Concordance	Discordance	Concordance Rank	Discordance Rank	Average Rank
ASUZU	-0.861323	3.113218431	6	7	6.5
DOAS	1.1363825	-2.826779019	3	2	2
FROTO	3.0985503	-3.947022272	1	1	1
KARSN	-4.515724	6.192617249	8	8	8
OTKAR	-1.59859	1.173775735	7	6	6.5
TMSN	0.4656778	-1.988855273	4	3	4
TOASO	-0.458232	0.049184643	5	5	5
TTRAK	2.7332575	-1.766139495	2	4	3

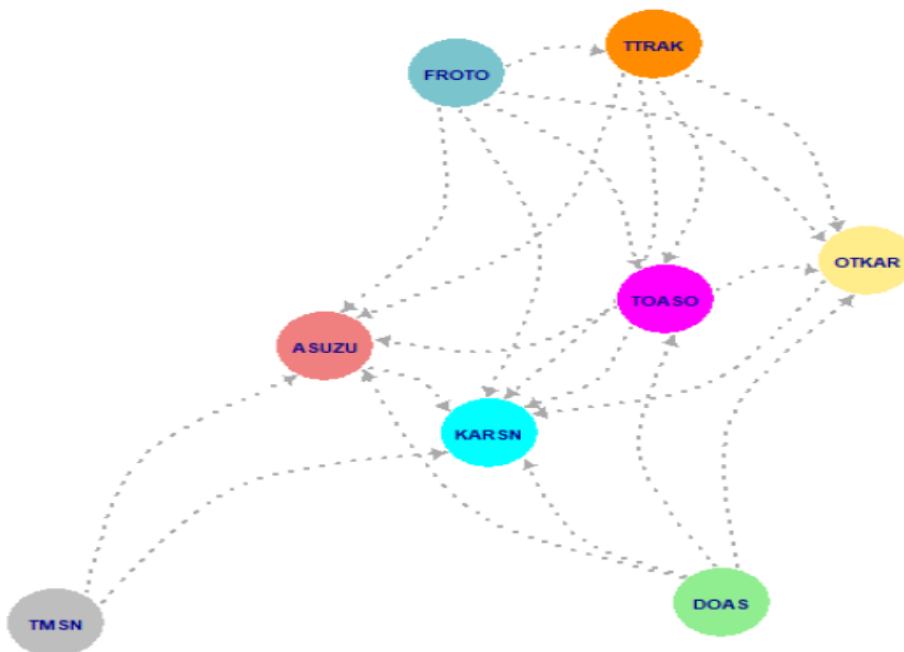


Figure 7. Bilateral Superiority Graph for 5-year mean values

4.3. TOPSIS Method

The basic idea in the TOPSIS method is that the chosen alternative should have the shortest distance from the ideal solution and the longest distance from the negative-ideal solution (Jollyta, 2018). The method consists of the following steps.

a) First, the normalized decision matrix n_{ij} is calculated. Here, while x_{ij} represents the j criterion, m represents the alternative.

$$n_{ij} = \frac{x_{ij}}{\sum_{i=1}^m x_{ij}^2} \tag{14}$$

b) In the second step, the weighted normalized decision matrix y_{ij} is calculated.

$$y_{ij} = w_i n_{ij}, j = 1, \dots, J; i = 1, \dots, m \tag{15}$$

w_i indicates the weight of the i . criterion. $\sum_{i=1}^m w_i = 1$.

c) The positive ideal solution matrix (A^+) and negative ideal solution matrix (A^-) values are calculated using the following equation.

$$A^+ = (y_1^+, y_2^+, \dots, y_n^+) \tag{16}$$

$$A^- = (y_1^-, y_2^-, \dots, y_n^-) \tag{17}$$

d) The distance between the matrices is calculated as follows.

$$D_i^+ = \sqrt{\sum_{j=1}^m (y_i^+ - y_{ij}^+)^2} \tag{18}$$

$$D_i^- = \sqrt{\sum_{j=1}^m (y_{ij}^- - y_i^-)^2} \tag{19}$$

e) The value of alternative i , V_i , is calculated as follows.

$$V_i = \frac{D_i^-}{D_i^- + D_i^+} \tag{20}$$

TOPSIS results were shown in Table 9, Figure 8 and Figure 9.

Table 9: Relative proximity values by years and 5-year average

Companies	2017	2018	2019	2020	2021	2017-2021
ASUZU	0.32317374	0.27386950	0.31123068	0.1941255	0.29007539	0.25623512
DOAS	0.47616350	0.49783267	0.44970480	0.58197053	0.81866484	0.56815948
FROTO	0.59836582	0.65343445	0.62545979	0.56158199	0.51011500	0.59047017
KARSN	0.23645789	0.16586464	0.21150327	0.17098816	0.15186217	0.12127219
OTKAR	0.39556790	0.45734881	0.50453408	0.33579383	0.33527034	0.38811699
TMSN	0.51712849	0.40950523	0.36812255	0.45311442	0.32585331	0.42774866
TOASO	0.52964543	0.58811491	0.59517730	0.33470814	0.37182429	0.46478912
TTRAK	0.55267270	0.52131691	0.44533415	0.53300465	0.57033771	0.51257742

When Table 9, Figure 8 and Figure 9 were examined in detail, it was seen that DOAS and TTRAK were the companies that responded best to the situation brought about by the COVID-19 pandemic. In addition, OTKAR and TOASO companies were more affected by the pandemic than other companies.

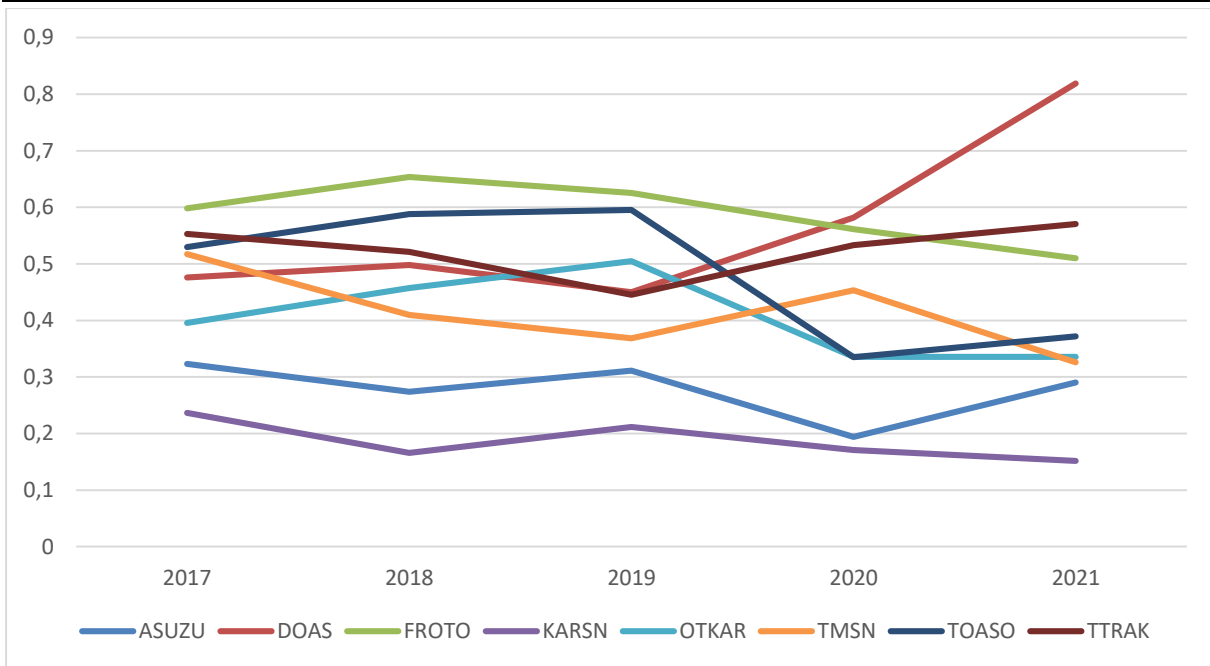


Figure 8: Relative proximity displays by year

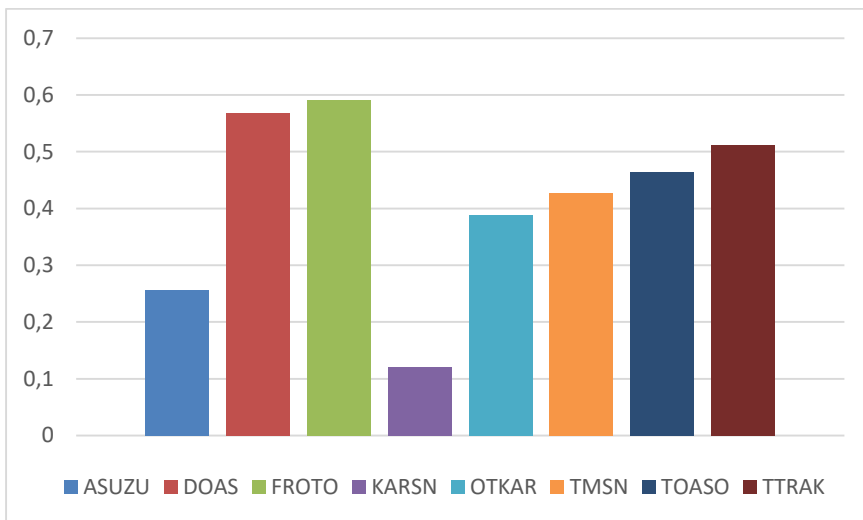


Figure 9: Relative proximity indications relative to the 5-year average

5. Conclusions

One of the important problems in developing countries like Türkiye is the current account deficit. Reducing the current account deficit, also known as the export-import coverage ratio, is possible by increasing exports or reducing imports. At the same time, one of the most important indicators of the country's growth is the increase in exports.

In this study, the financial performances of 8 companies from the automotive sector, which is one of the important export revenue items of the Turkish economy, for the years 2017-2021 were examined. The results were evaluated using the Multi-Criteria Decision Making methods TOPSIS and ELECTRE, taking into account annual and 5-year average values. 13 financial ratios were used in the study. These ratios are current ratio, liquidity ratio, cash ratio, receivable turnover ratio, total assets turnover ratio, current asset turnover ratio, financial leverage ratio, equity ratio, financing ratio, short term assets ratio, long term assets ratio, active profitability ratio and return on equity ratio.

When the TOPSIS results were examined, it was observed that DOAS drew a successful graph with the onset of COVID-19 and was the company that was least affected by the process. Again, it was seen that TTRAK company had a positive process during the pandemic period. In general, the successful performance of FROTO was another remarkable point.

When the ELECTRE results were examined, the successful performance of FROTO and DOAS was observed. It is seen that TTRAK company has had a successful process in general.

When the methods used are evaluated together; It was observed that DOAS, which followed a horizontal course until the onset of the Pandemic in a 5-year period, entered an increasing trend with the Pandemic and separated from other companies in terms of trend. In the same way, while the TTRAK company experienced a relative decline in the process until the pandemic, it was seen that it had a positive trend with the pandemic. It was seen that FROTO company went through the whole process with little influence and drew a successful picture. While OTKAR company exhibited a positive trend until the pandemic, it was seen that its trend deteriorated with the pandemic. The fact that ASUZU, KARSN, TMSN and TOASO companies have spent the 5-year period with a horizontal trend, showed that they were not affected by the pandemic and showed a strong stance.

When both TOPSIS and ELECTRE results were examined, it was seen that companies also passed the process without any serious problems.

This performance of companies in the face of a disaster that shook the world deeply, such as the pandemic, is extremely positive.

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