

An Evaluation of the Performances of Foreign Capital Trade Companies in Bist and the Sustainability Index through the TOPSIS Method

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Abstract

The relationship between the financial performances of firms and the stock return has been frequently subject to examination in the literature. Realistic manifestation of these relationships is particularly guiding for decisions to be made by investors, stakeholders and managers. In this study, the performance ranking of the companies was conducted using the TOPSIS method, which is one of the multi-criteria decision making models, by questing whether there is any difference in the performances of Foreign Trade Capital Companies of BİST and Sustainability Index. The method builds a performance ranking of companies according to their proximity and distance to the ideal solution. The necessary data are obtained from the financial statements of the companies by assuming that the significance level of the financial ratios used in the performance measurement is equal, and analyses were run with the relevant financial ratios. Furthermore, various types of weightings made by the entropy weighting method and based on expert opinions did not change the ranking.

The ranking of companies according to their performances and the identification of the direction of the relationship between them as to share returns are of vital importance for both companies and stakeholders. Findings will make a significant contribution to the companies in this sector in strategy determination. On the other hand, the results indicate that taking part in the sustainability index will also have a guiding impact on investors' stock preferences.

Keywords: TOPSIS Model, Performance Evaluation, İstanbul Stock Exchange, Sustainability Index.

1. Introduction

Businesses' making profit and surviving in the long run predominantly depends on their ability to implement their social responsibilities that they bear against the society. The concept of social responsibility can be expressed in the simplest form as the firm's conducting activities towards realizing the interests of the society, as well as their own economic interests (Şimşek, Çelik, 2013: 33). Corporate social responsibility and sustainability activities have started to take an important place in the agenda of all institutions and organizations related to capital markets in recent years. With the inclusion of social responsibility and environmental issues within the scope of corporate management, many organizations have started to publish corporate social responsibility reports. It is seen that stock exchanges have been more extensively engaged in social responsibility activities and increasingly more stock exchanges have been developing projects that are sensitive to social life and environment. Moreover, activities are being carried out through the working group formed by the World Federation of Exchanges (WFE) toward determining the role of stock exchanges in creating a sustainable society. Corporate sustainability is defined as firms'

taking into consideration economic, environmental and social factors in the activities and decision making mechanisms of the firm together with corporate management principles and effectively managing the risks associated with these factors to create long-term assets (BİST, 2018, Sustainability Guide for Companies, www.borsaistanbul.com). Measuring and ranking the financial performances of companies is also considered a decision making problem. In performance measurement, the so-called traditional methods are financial methods. Financial performance measurement methods are run based on accounting data. The aim in financial performance measurement is to present information about the financial status of the company to decision makers. Financial analyses help business managers make decisions for the future, and at the same time provide investors with information about the company and allows credit institutions to make loan decisions about the company. In this study, financial performance measured through financial ratios is analyzed using the TOPSIS method. The analysis is conducted on Foreign Trade Capital Companies that take part in BIST and Sustainability Index. The aim of the study is to determine whether the companies subject to this study have any enhancement in their performances in comparison to those which are not. For this purpose, the application related to the TOPSIS method was included in the study merely as an example for 2017, and only the outcomes were addressed for the other years. In the following sections of the study, literature review is presented following a brief notification about the concept of sustainability and sustainability index. Analysis findings are presented after the data and method section and the study is finalized with the conclusions and evaluation section.

2. Sustainability and Sustainability Index

The concept of sustainability became popular in 1987 with the publication of the Brundtland Report entitled "Our Common Future". The first form of the concept of sustainability dates back to the early 1900s (Christofi et al., 2012). According to the Brundtland report, the concept of sustainability is defined as meeting the needs of the present generation without compromising the ability of future generations to meet their own needs (Brundtland Report, 1987). At the same time, sustainability is a worldwide concept exhibiting the development efforts of governments, business managers, local communities, voluntary organizations, non-governmental organizations and other interested people, by preserving natural wealth without reducing and making it a focus of attention (Zsolnai, 2002, Isaksson and Steimle, 2009). Brundtland is a report emphasizing the value that the shareholders underline and containing concepts of corporate social responsibility and sustainability (Christofi et al., 2012).

Sustainable development can be defined in its most common use, as meeting the needs of present generations without jeopardizing the opportunities of future generations to meet their own needs. Corporate Sustainability can be defined as taking into consideration the economic, environmental and social factors together with corporate governance principles in company activities and decision making mechanisms and effectively managing the risks associated with these factors in order to create long term value in companies. (<http://www.borsaistanbul.com/data/kilavuzlar/surdurulebilirlik-rehberi.pdf>).

The Index provides competitive advantage in effectively managing the corporate risks and opportunities for Turkish companies. There is an investable index on which new instruments can be developed to attract capital to companies. The index reflects companies' approaches to key sustainability issues, including global warming, depletion of natural resources, health, safety and employment, and makes, in a sense, an independent assessment of their decisions on their activities and records related to these issues.

The index presents companies the opportunity to compare their sustainability performances at both local and global levels. The Index and Istanbul Stock Exchange provide a tool for companies to evaluate their performances by improving their risk management

capabilities in terms of transparency, accountability and sustainability and assess their performance, and ultimately adopt new targets or increase their performance. This enables companies to acquire competitive advantage. Companies that join in the index are enhancing their brand awareness and prestige.

The index facilitates access to global customers, capital and low-cost financing for companies. The project aims to create a tool that allows investors to choose and invest in companies that adopt sustainability and corporate governance principles (<http://www.borsaistanbul.com/data/kilavuzlar/surdurulebilirlik-rehberi.pdf>).

Factors of the Sustainability Concept

Environmental Natural Resource Use, Environmental Management, Pollution Prevention (Air, Water, Soil, Wastes)

Social-Environment Environmental Justice, Protector of Natural Resources Locally and Globally

Environmental Economy Energy Efficiency, Subsidies and Incentives in the use of Natural Resources.

Social Life standard, Education, Society Consciousness, Equality of Opportunity

Economic Social Work Ethics, Fair Trade, Labor Rights

Economic Profit, Saving, Economic Growth, Research and Development (<http://www.borsaistanbul.com/data/kilavuzlar/surdurulebilirlik-rehberi.pdf>).

Companies can only achieve real success when they consider sustainability applications as a whole of resources, expertise, opportunity and innovations that can be utilized by all shareholders, rather than a burden. Sustainability has environmental, social and corporate management aspects as well as the economic aspect and for a robust sustainability strategy, all of these aspects need to be accounted for as a whole and integrated in the decision making mechanisms. A company takes concrete steps in sustainability by properly adopting and putting into practice transparency, fairness, accountability and responsibility which are the basic principles of corporate management; by using technologies that contaminate the nature less during production; by making the consciousness of protecting the environment a priority in all stages of its company; by delivering healthy products to consumers who are end users of its products; by improving the working conditions of its employees and implementing necessary ethics rules, and by saving by energy in manufacturing and operating processes, or improving energy efficiency; or by developing innovative products.

(<http://www.borsaistanbul.com/data/kilavuzlar/surdurulebilirlik-rehberi.pdf>.)

BIST-Sustainability index has been created on November 4, 2014. The purpose of this index is defined “to form an index to involve companies that are traded in İstanbul Stock Exchange and that have high corporate sustainability performance, and enhancement of understanding, knowledge and application about the subject of sustainability in Turkey, and especially among the companies in the İstanbul Stock Exchange” (<http://www.borsaistanbul.com/en/indices/bist-stock-indices/bist-sustainability-index>). On the web page including information on this index, the expectations from the very index are emphasized as: these companies, that manage corporate risks and opportunities effectively, will have competitive advantage and a higher hand in acquiring new investors and gaining finance. Besides, firms that arrange their activities for a sustainable environment, and implement this as a social responsibility and transparently report, enhance their chances of having brilliant and dynamic employees that respect environment, and investors and shareholders that value them. Furthermore, it shouldn't be forgotten that innovation is boosted and organizational commitment is enhanced in companies that present sustainability report. (Herzig and Schalttegger, 2006: 302).

The purpose of this index is defined “to form an index to involve companies that are traded in İstanbul Stock Exchange and that have high corporate sustainability performance, and enhancement of understanding, knowledge and application about the subject of sustainability in Turkey, and especially among the companies in the İstanbul Stock Exchange (Sustainability Index Basic Rules).

Thanks to the index, companies are provided with a performance evaluation tool to make improvement and set new targets. They will be provided with the opportunity to improve their institutional transparency and accountability and the ability to develop risk management skills related to sustainability matters (Ünal, Yüksel, 2017: 266).

3. Methods Used in the Measurement of Financial Performance

Financial ratios are frequently used as data sets in performance measurement. It is seen that financial ratios, which are sometimes criticized and approached cautiously with the claim of being not very reliable, continue to be used as an indispensable method of analysis at the same time. Salmi and Martikainen (1994) argue that the analyses made by financial ratios are valid to the extent that they contribute to decision-making process in different areas. While the history of financial analysis is very old, the usage of financial ratios is rather new. In this, the contribution of accessing financial data by means of digital technologies is great. Moreover, modern data processing techniques and statistical package programs, that appeared thanks to technological advances, have made the data processing process much faster and easier.

TOPSIS, which is one of the methods used in the decision-making process, is a technique that enables the selection of the best alternative among alternatives. TOPSIS is one of the multipurpose decision making (MPDM) methods developed by Hwang and Yoon in 1981 (Hwang and Yoon, 1981). The TOPSIS word consists of the initials of Technique for Order Preference by Similarity to Ideal Solution words.

The TOPSIS method is utilized in the solution of real life problems in several areas such as supply chain management, supplier selection, logistics, engineering, production systems, business and marketing applications, human resources management, financial applications, energy management, chemical engineering and water resources management (Behzadian et al. 2012).

Despite the presence of various decision making mechanisms in current decision making methods, the TOPSIS method, which is composed of different stages in the literature, is a multi-criteria group decision method that is useful, important and widely examined. The alternative chosen by the TOPSIS method should be the one that is nearest to the ideal positive solution and the farthest from the negative ideal solution.

The decision-making process is identified in the following five steps (Yue, 2014:277,141-153):

- (1) Normalization of Decision Matrices;
- (2) Weighting of Normalized Decision Matrices;
- (3) Acquisition of Positive Ideal and Negative Ideal Solution Values;
- (4) Acquisition of Distance Values to the Positive Ideal and Negative Ideal points;
- (5) Ranking of Alternatives;

Since then, several extended TOPSIS methods have been applied in the creation of different multiple decision-making scenarios. (Boran; Gene; Kurt; Akay, 2009, 36, 11363–11368.);

In a similar way, Ashtiani and colleagues extended the TOPSIS method to solve a multi-feature decision-making problem through interval-valued fuzzy sets.

He and Gong provided a natural generalization of the TOPSIS method to solve the multi-faceted decision making problem with fuzzy set heuristics.

Liu et al. developed a new TOPSIS method for decision making problems.

Yurdakul and İç, conducted an example study for the rating of five large scale automotive firms that operate in the automotive industry in Turkey and traded in İstanbul Stock Exchange by accounting for the financial ratios via the financial statements of the firms. They constituted a ranking of the firms using the TOPSIS method under certain criteria over years. Then the values of the firms in the stock market was compared with the ranking scores obtained (Yurdakul and İç, 2003:18).

Supçiller and Çapraz addressed the supplier selection problem in their study. In the study, the problem of choosing the most appropriate supplier to a firm was examined by using the multi-criteria decision-making methods of AHP and TOPSIS together (Supçiller and Çapraz, 2011:13).

Demireli, determined the performance of public banks that extensively operate across the country, using the multi-criteria decision-making method of TOPSIS in his study (Demireli: 2010:5,101,112).

Feng and Wang (2000) evaluated the performances of five of the airline companies operating in Taiwan through the TOPSIS method. The results of the study that used a total of 22 transportation and financial indicator variables on Taiwanese airline companies showed that financial indicators are more effective in determining the performance of the airline companies that have been evaluated.

Kim and Jung (2011) conducted a factor analysis with 16 financial criteria on 8 firms traded on the Korean stock exchange; following this, a correlation analysis was performed between the results of the TOPSIS method and the results of the financial ratios and the association was found to be weak. It has been stated that TOPSIS is a sufficient method in the selection of investment alternatives.

In the study by Wang and Hsu (2004) on 10 companies traded in Taiwan stock exchange which used 4 financial ratios (stock turnover, net profit margin, return per share and current ratio), it is suggested that the TOPSIS method can be useful for investors in decision-making and determination of investment strategies.

In the study by Bo and Haidong (2008) on 112 companies traded in China stock exchange which used 11 financial ratios (liquidity ratio, acid test ratio, borrowing ratio, working capital ratio, capital profitability, asset profitability, receivables, stock and asset turnover rate, net flow rate, net flow/ current liabilities rate), it has been identified that the TOPSIS method can be used as an early-warning system in companies in the times of financial crises.

The authors use economic growth rate, inflation rate, unemployment rate, current account balance, budget balance rates and TOPSIS method to measure macroeconomic performance. Urfalıoğlu and Genç (2013), compared the performances of Turkey and the European Union countries, using the ELECTRE, TOPSIS and PROMETHEE methods. They used GDP, economic growth rate, imports, exports, unemployment and inflation rates as economic performance indicators. They suggest that the results of these three methods have the same trend and that the results for the countries with the best performances are similar according to all models. The results of the TOPSIS analysis also showed that Turkey has been identified as the thirty-first best country.

There are also studies in the literature where the TOPSIS method and other methods have been used in combination. For example, Yalçın et al. (2012) ranked financial performance of companies operating in various sectors using Fuzzy AHP, TOPSIS and VIKOR methods. Bülbül and Köse (2011) used the TOPSIS and ELECTRE methods in determining the 2005-2008 financial performances of 19 firms operating in the Food, Liquor and Tobacco Industry registered in İstanbul Stock Exchange and found that the rankings obtained by both methods revealed similar results.

Mandic et al. (2014) used the fuzzy AHP and TOPSIS methods for evaluating the financial performances of banks. They found that Banca Intesa had the best rating by using indicators such as equity, portfolio, resources, liquid assets, cash, net interest income, core activity net income and pre-tax profits to determine the best performing financial intermediary in the Serbian banking sector between 2005 and 2010.

Eyüboğlu (2015) compared the macroeconomic performances of developing countries such as Turkey, Poland, Mexico, Chile, Malaysia, Hungary, Indonesia, China, Argentina and Brazil using the TOPSIS-AHP couple with data on economic growth rate, inflation rate, unemployment rate and the current account balance. The author found that Malaysia and China were the highest performing countries between 2003 and 2013.

Wanke et al. (2016) utilized the TOPSIS method to examine the 2009 and 2013 period activity of the banks in Malaysia using net income to measure personnel expenditure, total operating expenditures, asset earnings, deposits, net interest income, operating profit and corporate performance. They argued that Maybank Berhad was the most efficient bank in Malaysia during the selected period.

4. Method

In order to determine the financial performances of Foreign Trade Capital Companies carrying out activities in BIST and Sustainability Index, TOPSIS, which is a multi-criteria decision-making method, and financial ratios have been used. Within the scope of the application, the financial performances of the companies have been compared by ranking through both TOPSIS and financial ratios.

The TOPSIS method is applied by comparing alternative options in line with certain criteria to obtain the optimum results between the maximum and minimum values that these criteria can take. The TOPSIS method is a process that consists of 6 steps (Yurdakul and İç, 2003: 11-13; Eleren and Karagül, 2008:6-7; Ustasüleyman, 2009: 37-38; Demireli, 2010: 104-106; Dumanoglu and Ergül, 2010:101-111; Çonkar, Elitaş and Atar, 2011:98-99; Bülbül and Köse, 2011:11-13).

Step 1: Formation of Decision Matrices

Decision matrix is a matrix that should be formed by the decision-maker. The alternatives to be ranked according to superiority are placed at the lines of the matrix and the evaluation factors to be used in decision making are placed at the columns. This matrix is the initial matrix that is determined by the decision-maker. Each a_{ij} in the decision matrix represents the real value of the i . alternative according to the j criterion. This matrix can be shown as follows;

$$A_{ij} = \begin{matrix} & \text{Faktörler} & \\ & \begin{matrix} a_{11} & a_{12} & \dots & a_{1p} \\ a_{21} & a_{22} & \dots & a_{2p} \\ \cdot & & & \cdot \\ \cdot & & & \cdot \\ \cdot & & & \cdot \\ a_{m1} & a_{m2} & \dots & a_{mp} \end{matrix} & \\ \begin{matrix} \cdot \\ \cdot \\ \cdot \\ \cdot \end{matrix} & \text{Karar Kriterleri} & \end{matrix} \quad (1)$$

Step 2: Acquisition of the Normalized Matrix

After the decision matrix is formed, each a_{ij} values ($a_{11}, a_{21}, a_{31} \dots a_{m1}$) are squared and column totals that is the sum of these values are obtained; the normalization process is run by

dividing each a_{ij} value in the decision matrix by the square root of the sum of the column where it belongs to. The notation related to this process is demonstrated below;

$$N_{ij} = \frac{a_{ij}}{\sqrt{\sum_{i=1}^m a_{ij}^2}} \quad (i = 1, \dots, m \text{ ve } j = 1, \dots, n)$$

The normalized matrix is obtained as follows;

$$N_{ij} = \begin{bmatrix} n_{11} & n_{12} & \dots & n_{1p} \\ n_{21} & n_{22} & \dots & n_{2p} \\ \cdot & & & \cdot \\ \cdot & & & \cdot \\ \cdot & & & \cdot \\ n_{m1} & n_{m2} & \dots & n_{mp} \end{bmatrix} \quad (2)$$

Step 3: Acquisition of the Weighted Normalized Matrix

Each value of the normalized matrix is weighted with a value such as w_{ij} . The weighting process manifests the subjective aspect of the TOPSIS method because the weighting process is run based on the level of significance of the factors. Weighting is the only subjective parameter of the TOPSIS method. The issue that needs to be noted here is the sum of w_i values should be equal to 1.

$$\sum_{i=1}^n w_i = 1$$

That is, it will be. The weighted normalized matrix (V matrix) is obtained by multiplying the n_{ij} values that are obtained through the normalized matrix by the w_{ij} weights (Supçiller & Çapraz, 2011).

Step 4: Acquisition of Ideal and Negative Ideal Solution Values

$$V_{ij} = \begin{bmatrix} w_1 n_{11} & w_2 n_{12} & \dots & w_n n_{1p} \\ w_1 n_{21} & w_2 n_{22} & \dots & w_n n_{2p} \\ \cdot & & & \cdot \\ \cdot & & & \cdot \\ \cdot & & & \cdot \\ w_1 n_{m1} & w_2 n_{m2} & \dots & w_n n_{mp} \end{bmatrix} \Rightarrow V_{ij} = \begin{bmatrix} v_{11} & v_{12} & \dots & v_{1p} \\ v_{21} & v_{22} & \dots & v_{2p} \\ \cdot & & & \cdot \\ \cdot & & & \cdot \\ \cdot & & & \cdot \\ v_{m1} & v_{m2} & \dots & v_{mp} \end{bmatrix} \quad (3)$$

After the weighted normalized matrix (V matrix) is obtained, depending on the structure of the problem, i.e., if our purpose is maximization, then the maximum values of each column are obtained. These maximum values are our ideal solution values. Then, the minimum values of each column are obtained. These are the negative ideal solutions. If our purpose is minimization, the values to be obtained will be the exact opposites. The notation related to the acquisition of ideal and negative ideal solution values is as shown below;

Ideal solution values:

$$A^+ = \left\{ \max_i v_{ij} \text{ olmak üzere} \right\}$$

$$\Rightarrow A^+ = \{v_1^+, v_2^+, \dots, v_n^+\} \text{ Maximum values of each columns}$$

Negative ideal solution values:

$$V_{ij} = \begin{bmatrix} w_1 n_{11} & w_2 n_{12} & \dots & w_n n_{1p} \\ w_1 n_{21} & w_2 n_{22} & \dots & w_n n_{2p} \\ \vdots & \vdots & \ddots & \vdots \\ w_1 n_{m1} & w_2 n_{m2} & \dots & w_n n_{mp} \end{bmatrix} \Rightarrow V_{ij} = \begin{bmatrix} v_{11} & v_{12} & \dots & v_{1p} \\ v_{21} & v_{22} & \dots & v_{2p} \\ \vdots & \vdots & \ddots & \vdots \\ v_{m1} & v_{m2} & \dots & v_{mp} \end{bmatrix} \quad (3)$$

$$A^- = \left\{ \min_i v_{ij} \text{ olmak üzere} \right\}$$

$$\Rightarrow A^- = \{v_1^-, v_2^-, \dots, v_n^-\} \text{ Minimum values of each columns} \quad (4)$$

Step 5: Acquisition of Distance Values to Ideal and Negative Ideal Points

Euclidean distance is used when calculating the distance values to ideal and non-ideal points. In order to find the distance between two points whose x and y coordinates are known on the coordinate plane, that is in the calculation of the Euclidean distance (Alpar Reha, 2011);

$$d_{ij} = \sqrt{\sum_{k=1}^p (x_{ik} - x_{jk})^2} \quad (5)$$

The formula is used. Where:

x_{ik} denotes k. variable value of i. observation
 x_{jk} denotes k. variable value of j. observation, and

p denotes the number of variables.

Here, the Euclidean distance which is the closest to the ideal solution and the distance that is farthest from the negative ideal solution is tried to be found. If this formula is generalized to be able to calculate the distance to the ideal and non-ideal points, then a calculation way as follows is applied (Özcan, Elebi, & Esnaf, 2011):

Ideal distance:

$$S_i^+ = \sqrt{\sum_{j=1}^n (v_{ij} - v_j^+)^2}$$

Negative Ideal Distance:

$$S_i^- = \sqrt{\sum_{j=1}^n (v_{ij} - v_j^-)^2}$$

Here, there will be as many S_i^+ ve S_i^- as the number of decisions.

Step 6: Calculation of Relative Proximity to Ideal Solution

In the calculation of the relative proximity of each decision point to the ideal solution, the distance to ideal and non-ideal points are used. Relative proximity to ideal solution is symbolized by C_i^* . Here, the C_i^* value takes values between the $0 \leq C_i^* \leq 1$ range and while $C_i^* = 1$ demonstrates the absolute solution proximity of the related decision point to the ideal solution, $C_i^* = 0$ demonstrates the absolute solution proximity of the related decision point to the negative ideal solution (Lin, Wang, Chen, & Chang, 2008).

$$C_i^* = \frac{S_i^-}{S_i^- + S_i^+} \quad (6)$$

Performance Criteria

SDH	Stock Turnover Ratio	Cost of Goods Sold / Average Stocks
ADH	Assets Turnover Ratio	Net Sales / Total Assets (Asset)
DVDH	Fixed Assets Turnover Ratio	Net Sales / Fixed Assets
HDDH	Liquid Assets Turnover Ratio	Net Sales / Liquid Assets
AK	Asset Profitability	Net Profit / Total Asset
ÖK	Equity Profitability	Net Profit / Total Equity
HBK	Profit per Share	Net Profit / Number of Shares
F/K	Price / Earnings	Stock Market Price / Profit Per Share
KM	Profit Margin	Net Profit / Net Sales

SDH - Stock Turnover Ratio, is the ratio demonstrating the relationship between stocks and sales. It measures the speed at which stocks are converted into cash in a certain period (Ceylan, Korkmaz, 2015:65).

ADH - Asset Turnover Ratio measures the speed and efficiency in which the assets are converted into cash (Lazol, 2010:64).

DVDH - Fixed Asset Turnover Ratio helps to determine the level of investment in fixed assets. The tendency of the ratio to decrease shows that the capacity utilization is decreased and that fixed assets cannot be used efficiently while the tendency of the ratio to increase shows that the capacity utilization ratio is on rise and the company uses the fixed assets efficiently.

HDDH - Liquid Assets Turnover Ratio measures the turnover speed of the liquid assets of enterprises in a given period.

AK - Asset Profitability Ratio measures whether the assets are utilized efficiently or not.

ÖK - Equities Profitability Ratio, measures the earning power of equities.

HBK - Profit per Share Ratio, shows the amount of the term profits per share to be distributed to shareholders.

F/K - Price / Earnings Ratio, is a ratio that informs investors. The increase in the coefficient indicates that the stock should be sold whereas a decrease indicates that the stock should be bought.

KM - Profit Margin, indicates the earning power of each TL spent for the sales (Lazol, 2010:67-75, Ceylan, Korkmaz, 2015:65-75, B ker, A sko lu, Sevil,2008:101-110).

5. Findings

Table 1 2017 Financial Ratio Outcomes of Foreign Trade Capital Companies that Take Place in the BIST and Sustainability Index (Decision Matrix)

FINANCIAL RATIOS	SDH	ADH	DVDH	HDDH	AK	�K	HBK	F/K	NK/NS
COMPANIES									
AR�ELİK	4,38	1,02	3,05	8,07	0,04	0,12	1,25	14,54	0,04
FORD OTOSAN	20,58	2,11	4,88	14,03	0,12	0,4	4,24	14,01	0,06
���E CAM	3,75	0,53	0,87	3,2	0,06	0,09	0,54	9,14	0,11
TOFA�	15,74	1,26	2,84	5,39	0,09	0,36	2,57	11,19	0,07
T�PRA�	10,72	1,41	3,03	6,13	0,1	0,36	15,22	6,89	0,07
T�RK TRAKT�R	6,21	1,51	5,32	9,54	0,12	0,42	6,01	12,06	0,08
VESTEL	9,03	1,27	5,21	52,36	0,1	0,29	1,55	7,03	0,08
BORUSAN	3,79	0,68	1,14	5,5	0,06	0,13	1,72	7,84	0,085
BOSCH	15,98	1,7	10,39	4,99	0,23	0,33	8,6	21,56	0,13
ERE�Lİ DEMİR �ELİK	2,9	0,66	1,38	2,65	0,13	0,19	1,07	9,88	0,2
İZMİR DEMİR �ELİK	2,5	0,98	1,5	16,52	0,005	0,022	0,04	75,8	0,005
MENDERES TEKSTİL	2,74	0,71	1,38	21,99	0,05	0,16	0,22	4,78	0,066
PERGAMON STATUS	0	0,007	54,85	0,03	0,02	0,37	1,66	3,61	2,51
SANKO	366	1,89	5,96	22,08	0,064	0,09	0,33	10,73	0,034
SASA DI� TİC.	6,02	0,69	1,31	19,48	0,08	0,18	0,49	24,98	0,12
TGS A�	0	0,006	2,27	1,17	0,001	0,075	0,29	14,93	0,23

Table 2 Acquisition of the 2017 Normalized Table of Foreign Trade Capital Companies that Take Place in the BIST and Sustainability Index

FINANCIAL RATIOS	SDH	ADH	DVDH	HDDH	AK	�K	HBK	F/K	NK/NS
COMPANIES									
AR�ELİK	19,1844	1,0404	9,3025	65,1249	0,0016	0,0144	1,5625	211,4116	0,0016
FORD OTOSAN	423,5364	4,4521	23,8144	196,8409	0,0144	0,16	17,9776	196,2801	0,0036
���E CAM	14,0625	0,2809	0,7569	10,24	0,0036	0,0081	0,2916	83,5396	0,0121
TOFA�	247,7476	1,5876	8,0656	29,0521	0,0081	0,1296	6,6049	125,2161	0,0049
T�PRA�	114,9184	1,9881	9,1809	37,5769	0,01	0,1296	231,6484	47,4721	0,0049
T�RK TRAKT�R	38,5641	2,2801	28,3024	91,0116	0,0144	0,1764	36,1201	145,4436	0,0064
VESTEL	81,5409	1,6129	27,1441	2741,57	0,01	0,0841	2,4025	49,4209	0,0064
BORUSAN	14,3641	0,4624	1,2996	30,25	0,0036	0,0169	2,9584	61,4656	0,007225
BOSCH	255,3604	2,89	107,9521	24,9001	0,0529	0,1089	73,96	464,8336	0,0169
ERE�Lİ DEMİR �ELİK	8,41	0,4356	1,9044	7,0225	0,0169	0,0361	1,1449	97,6144	0,04
İZMİR DEMİR �ELİK	6,25	0,9604	2,25	272,9104	0,000025	0,000484	0,0016	5745,64	0,000025
MENDERES TEKSTİL	7,5076	0,5041	1,9044	483,5601	0,0025	0,0256	0,0484	22,8484	0,004356
PERGAMON STATUS	0	0,000049	3008,523	0,0009	0,0004	0,1369	2,7556	13,0321	6,3001
SANKO	133956	3,5721	35,5216	487,5264	0,004096	0,0081	0,1089	115,1329	0,001156
SASA DI� TİC.	36,2404	0,4761	1,7161	379,4704	0,0064	0,0324	0,2401	624,0004	0,0144
TGS A�	0	0,000036	5,1529	1,3689	0,000001	0,005625	0,0841	222,9049	0,0529
	135223,7	22,54289	3272,79	4858,426	0,148922	1,073209	377,9096	8226,256	6,476962

Normalization of the decision matrix is achieved by dividing each value in the columns by the square root of the sum of squares of the values in the relevant column and reducing into a single denominator (**Table 2**). The positive and negative distance values of the weighted values has been calculated by means of the formula 5 (**Tables 4,5**). Ranking is carried out by calculating the absolute proximity to the ideal solution by means of the Formula 6.

Table 3 2017 Normalized Table of Foreign Trade Capital Companies that Take Place in the BIST and Sustainability Index

RATIOS	SDH	ADH	DVDH	HDDH	AK	ÖK	HBK	F/K	NK/NS
COMPANIES									
ARÇELİK	0,011911	0,214832	0,053314	0,115779	0,103654	0,115836	0,064301	0,160312	0,015718
FORD OTOSAN	0,055966	0,444407	0,085303	0,201285	0,310961	0,386119	0,218108	0,154469	0,023577
ŞİŞE CAM	0,010198	0,111628	0,015208	0,04591	0,155481	0,086877	0,027778	0,100774	0,043224
TOFAŞ	0,042804	0,26538	0,049643	0,077329	0,233221	0,347507	0,132202	0,123376	0,027506
TÜPRAŞ	0,029153	0,296973	0,052965	0,087946	0,259134	0,347507	0,782926	0,075966	0,027506
TÜRK TRAKTÖR	0,016888	0,318035	0,092994	0,136868	0,310961	0,405425	0,309158	0,132969	0,031435
VESTEL	0,024557	0,267487	0,091071	0,751198	0,259134	0,279936	0,079733	0,07751	0,031435
BORUSAN	0,010307	0,143221	0,019927	0,078907	0,155481	0,125489	0,088478	0,086441	0,0334
BOSCH	0,043457	0,358053	0,181618	0,07159	0,596009	0,318548	0,442389	0,237712	0,051083
EREĞLİ DEMİR ÇELİK	0,007886	0,139009	0,024123	0,038019	0,336875	0,183407	0,055041	0,108933	0,078589
İZMİR DEMİR ÇELİK	0,006799	0,206407	0,02622	0,237009	0,012957	0,021237	0,002058	0,835741	0,001965
MENDERES TEKSTİL	0,007451	0,14954	0,024123	0,315486	0,129567	0,154448	0,011317	0,052702	0,025934
PERGAMON STATUS	0	0,001474	0,958782	0,00043	0,051827	0,35716	0,085391	0,039802	0,986286
SANKO	0,995323	0,398071	0,104181	0,316777	0,165846	0,086877	0,016975	0,118305	0,01336
SASA DIŞ TİC.	0,016371	0,145327	0,022899	0,279475	0,207308	0,173754	0,025206	0,27542	0,047153
TGS AŞ	0	0,001264	0,03968	0,016786	0,002591	0,072397	0,014918	0,164612	0,090377
Weight	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11	0,11

Table 4 2017 Weighted Positive Distance Values of Foreign Trade Capital Companies that Take Place in the BIST and Sustainability Index

FINANCIAL RATIOS	SDH	ADH	DVDH	HDDH	AK	ÖK	HBK	F/K	NK/NS
COMPANIES									
ARÇELİK	0,011702	0,000638	0,00992	0,004886	0,002933	0,001015	0,006249	0,00552	0,011398
FORD OTOSAN	0,010677	5,28E-14	0,009232	0,003659	0,000983	4,51E-06	0,00386	0,005616	0,011214
ŞİŞE CAM	0,011743	0,00134	0,010773	0,006019	0,002348	0,001228	0,0069	0,006536	0,010761
TOFAŞ	0,010978	0,000388	0,010001	0,005495	0,001593	4,06E-05	0,005124	0,00614	0,011123
TÜPRAŞ	0,011295	0,000263	0,009928	0,005323	0,001373	4,06E-05	2,49E-14	0,006985	0,011123
TÜRK TRAKTÖR	0,011584	0,000193	0,00907	0,004567	0,000983	6,4E-14	0,002716	0,005976	0,011032
VESTEL	0,011403	0,000379	0,00911	5,05E-14	0,001373	0,000191	0,005983	0,006956	0,011032
BORUSAN	0,01174	0,001098	0,010666	0,005469	0,002348	0,000948	0,005835	0,006793	0,010986
BOSCH	0,010963	9,02E-05	0,007308	0,005589	6,85E-16	9,13E-05	0,001403	0,004327	0,010582
EREĞLİ DEMİR ÇELİK	0,011798	0,001129	0,01057	0,006154	0,000813	0,000596	0,006411	0,006392	0,009969
İZMİR DEMİR ÇELİK	0,011824	0,000685	0,010523	0,003199	0,004113	0,001786	0,007378	2,15E-12	0,011723
MENDERES TEKSTİL	0,011808	0,001052	0,01057	0,002297	0,002633	0,000762	0,007204	0,007419	0,011159
PERGAMON STATUS	0,011987	0,002374	3,51E-16	0,00682	0,003583	2,82E-05	0,005887	0,007665	2,23E-12
SANKO	3,68E-18	2,6E-05	0,008837	0,002284	0,002239	0,001228	0,007099	0,006228	0,011453
SASA DIŞ TİC.	0,011596	0,001082	0,010598	0,002693	0,001828	0,000649	0,006947	0,003799	0,010672
TGS AŞ	0,011987	0,002376	0,010221	0,006526	0,004261	0,001342	0,007137	0,00545	0,009712
Max	0,109485	0,048885	0,105466	0,082632	0,065561	0,044597	0,086122	0,091931	0,108491

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FINANCIAL RATIOS	SDH	ADH	DVDH	HDDH	AK	ÖK	HBK	F/K	NK/NS	TOPLAM	S+
COMPANIES											
ARÇELİK	0,011702	0,000638	0,00992	0,004886	0,002933	0,001015	0,006249	0,00552	0,011398	0,05426	0,232938
FORD OTOSAN	0,010677	5,28E-14	0,009232	0,003659	0,000983	4,51E-06	0,00386	0,005616	0,011214	0,045246	0,21271
ŞİŞE CAM	0,011743	0,00134	0,010773	0,006019	0,002348	0,001228	0,0069	0,006536	0,010761	0,057648	0,240099
TOFAŞ	0,010978	0,000388	0,010001	0,005495	0,001593	4,06E-05	0,005124	0,00614	0,011123	0,050881	0,225569
TÜPRAŞ	0,011295	0,000263	0,009928	0,005323	0,001373	4,06E-05	2,49E-14	0,006985	0,011123	0,04633	0,215245
TÜRK TRAKTÖR	0,011584	0,000193	0,00907	0,004567	0,000983	6,4E-14	0,002716	0,005976	0,011032	0,04612	0,214756
VESTEL	0,011403	0,000379	0,00911	5,05E-14	0,001373	0,000191	0,005983	0,006956	0,011032	0,046427	0,215469
BORUSAN	0,01174	0,001098	0,010666	0,005469	0,002348	0,000948	0,005835	0,006793	0,010986	0,055884	0,236397
BOSCH	0,010963	9,02E-05	0,007308	0,005589	6,85E-16	9,13E-05	0,001403	0,004327	0,010582	0,040354	0,200884
EREĞLİ DEMİR ÇELİK	0,011798	0,001129	0,01057	0,006154	0,000813	0,000596	0,006411	0,006392	0,009969	0,053832	0,232016
İZMİR DEMİR ÇELİK	0,011824	0,000685	0,010523	0,003199	0,004113	0,001786	0,007378	2,15E-12	0,011723	0,051232	0,226345
MENDERES TEKSTİL	0,011808	0,001052	0,01057	0,002297	0,002633	0,000762	0,007204	0,007419	0,011159	0,054905	0,234318
PERGAMON STATUS	0,011987	0,002374	3,51E-16	0,00682	0,003583	2,82E-05	0,005887	0,007665	2,23E-12	0,038345	0,195819
SANKO	3,68E-18	2,6E-05	0,008837	0,002284	0,002239	0,001228	0,007099	0,006228	0,011453	0,039394	0,198478
SASA DIŞ TİC.	0,011596	0,001082	0,010598	0,002693	0,001828	0,000649	0,006947	0,003799	0,010672	0,049864	0,223302
TGS AŞ	0,011987	0,002376	0,010221	0,006526	0,004261	0,001342	0,007137	0,00545	0,009712	0,059013	0,242925
Max	0,109485	0,048885	0,105466	0,082632	0,065561	0,044597	0,086122	0,091931	0,108491		

Table 5 2017 Weighted Negative Distance Values of Foreign Trade Capital Companies that Take Place in the BIST and Sustainability Index

FINANCIAL RATIOS	SDH	ADH	DVDH	HDDH	AK	ÖK	HBK	F/K	NK/NS	TOPLAM	S-
COMPANIES											
ARÇELİK	1,72E-06	0,000552	1,76E-05	0,000161	0,000124	0,000108	4,69E-05	0,000176	2,29E-06	0,001189	0,034481
FORD OTOSAN	3,79E-05	0,002376	5,94E-05	0,000488	0,001151	0,001611	0,000565	0,000159	5,65E-06	0,006453	0,08033
ŞİŞE CAM	1,26E-06	0,000147	2,47E-14	2,5E-05	0,000283	5,21E-05	8,01E-06	4,5E-05	2,06E-05	0,000582	0,02413
TOFAŞ	2,22E-05	0,000844	1,43E-05	7,16E-05	0,000644	0,001288	0,000205	8,45E-05	7,89E-06	0,003181	0,056402
TÜPRAŞ	1,03E-05	0,001058	1,72E-05	9,27E-05	0,000796	0,001288	0,007378	1,58E-05	7,89E-06	0,010665	0,103269
TÜRK TRAKTÖR	3,45E-06	0,001214	7,32E-05	0,000225	0,001151	0,001786	0,001141	0,000105	1,05E-05	0,005709	0,075561
VESTEL	7,3E-06	0,000858	6,96E-05	0,00682	0,000796	0,00081	7,3E-05	1,72E-05	1,05E-05	0,009462	0,097271
BORUSAN	1,29E-06	0,000244	2,69E-07	7,45E-05	0,000283	0,000132	9,04E-05	2,63E-05	1,2E-05	0,000863	0,029376
BOSCH	2,29E-05	0,00154	0,000335	6,13E-05	0,004261	0,00107	0,002346	0,000474	2,92E-05	0,010139	0,100694
EREĞLİ DEMİR ÇELİK	7,53E-07	0,00023	9,61E-07	1,71E-05	0,001352	0,000318	3,4E-05	5,78E-05	7,1E-05	0,002082	0,045624
İZMİR DEMİR ÇELİK	5,59E-07	0,000509	1,47E-06	0,000677	1,3E-06	4,03E-16	1,15E-13	0,007666	1,4E-14	0,008855	0,094103
MENDERES TEKSTİL	6,72E-07	0,000266	9,61E-07	0,001201	0,000195	0,000215	1,04E-06	2,01E-06	6,95E-06	0,001889	0,043457
PERGAMON STATUS	0	5,37E-10	0,010773	1,19E-13	2,93E-05	0,001365	8,4E-05	7,09E-14	0,011724	0,023975	0,15484
SANKO	0,011987	0,001905	9,58E-05	0,001211	0,000322	5,21E-05	2,69E-06	7,46E-05	1,57E-06	0,015652	0,12511
SASA DIŞ TİC.	3,24E-06	0,000251	7,16E-07	0,000942	0,000507	0,000281	6,49E-06	0,000672	2,47E-05	0,002689	0,051854
TGS AŞ	0	7,79E-17	7,25E-06	3,24E-06	2,3E-15	3,17E-05	2E-06	0,000188	9,46E-05	0,000327	0,01809
Min	0	0,000139	0,001673	4,73E-05	0,000285	0,002336	0,000226	0,004378	0,000216		

Table 6 2017 Performance Rankings in Different Weights of Foreign Trade Capital Companies that Take Place in the BIST and Sustainability Index

	S+	S-	CC	TOPSİS	UZMAN	ENTROPİ	MAX
COMPANIES							
ARÇELİK	0,232938	0,034481	0,128941	13	13	13	11
FORD OTOSAN	0,21271	0,08033	0,274125	7	7	8	6
ŞİŞE CAM	0,240099	0,02413	0,091321	15	15	16	16
TOFAŞ	0,225569	0,056402	0,200028	9	9	10	10
TÜPRAŞ	0,215245	0,103269	0,324222	4	4	3	8
TÜRK TRAKTÖR	0,214756	0,075561	0,260269	8	8	7	9
VESTEL	0,215469	0,097271	0,311028	5	6	5	3
BORUSAN	0,236397	0,029376	0,110529	14	14	15	13
BOSCH	0,200884	0,100694	0,333891	3	3	6	4
EREĞLİ DEMİR ÇELİK	0,232016	0,045624	0,164329	11	10	12	14
İZMİR DEMİR ÇELİK	0,226345	0,094103	0,293661	6	5	4	2
MENDERES TEKSTİL	0,234318	0,043457	0,156448	12	12	11	12
PERGAMON STATUS	0,195819	0,15484	0,441568	1	1	2	5
SANKO	0,198478	0,12511	0,386633	2	2	1	1
SASA DIŞ TİC.	0,223302	0,051854	0,188452	10	11	9	7
TGS AŞ	0,242925	0,01809	0,069305	16	16	14	15

Table 7 2016 Ratio Results of Foreign Trade Capital Companies that Take Place in the BIST and Sustainability Index

FINANCIAL RATIOS	SDH	ADH	DVDH	HDDH	AK	ÖK	HBK	F/K	NK/NS
COMPANIES									
ARÇELİK	4,39	0,95	2,72	6,59	0,08	0,22	1,92	10,85	0,08
FORD OTOSAN	15,77	1,97	3,97	15,38	0,1	0,3	2,72	12,06	0,05
ŞİŞE CAM	3,24	0,44	0,73	2,58	0,04	0,06	0,36	9,87	0,09
TOFAŞ	17,55	1,2	2,54	5,97	0,08	0,33	1,94	12,65	0,07
TÜPRAŞ	10,93	1,12	1,98	5,76	0,06	0,22	7,16	9,92	0,05
TÜRK TRAKTÖR	5,03	1,49	4,78	15,07	0,16	0,53	6,93	10	0,11
VESTEL	2,8	1,33	6,48	236,73	0,14	0,35	1,71	3,82	0,11
BORUSAN	2,89	0,55	0,8	19,54	0,03	0,06	0,72	12,33	0,05
BOSCH	16,43	1,44	8	3,83	0,24	0,32	7,4	18,48	0,16
EREĞLİ DEMİR ÇELİK	2,45	0,49	0,92	2,54	0,06	0,1	0,43	12,65	0,13
İZMİR DEMİR ÇELİK	6,87	0,75	1,1	8,18	-0,02	-0,11	-0,19	-15,74	-0,03
MENDERES TEKSTİL	3,18	0,77	1,42	27,28	-0,003	-0,01	-0,011	-57,71	-0,004
PERGAMON STATUS	0	0,01	23,55	0,03	0,009	0,15	0,48	6,38	0,94
SANKO	770	1,99	8,17	26,99	0,06	0,1	0,43	6,28	0,03
SASA DIŞ TİC.	5,19	1,15	4,55	158,16	0,13	0,26	0,37	7,67	0,11
TGS AŞ	0	0,007	1,96	0,13	0,002	0,1	0,38	10,11	0,3

Table 8 2015 Ratio Results of Foreign Trade Capital Companies that Take Place in the BIST and Sustainability Index

FINANCIAL RATIOS	SDH	ADH	DVDH	HDDH	AK	ÖK	HBK	F/K	NK/NS
COMPANIES									
ARÇELİK	4,51	1,03	3,71	6,53	0,06	0,19	1,32	12,47	0,06
FORD OTOSAN	18,78	1,98	3,8	17,08	0,1	0,27	2,4	12,44	0,05
ŞİŞE CAM	3,38	0,47	0,81	2,35	0,046	0,076	0,38	6,96	0,097
TOFAŞ	17,53	1	2,13	4,02	0,08	0,32	1,66	11,29	0,08
TÜPRAŞ	14,65	1,45	2,2	12,18	0,1	0,3	10,18	5,66	0,07
TÜRK TRAKTÖR	5,23	1,54	4,83	12,7	0,13	0,39	4,81	13,09	0,08
VESTEL	8,76	1,46	6,26	28,46	0,095	0,23	0,86	11,07	0,06
BORUSAN	3,51	0,62	0,99	8,09	0,006	0,015	0,13	44,48	0,01
BOSCH	9,45	1,24	6,35	3,02	0,17	0,24	4,97	28,75	0,14
EREĞLİ DEMİR ÇELİK	3,03	0,64	1,12	4,06	0,06	0,09	0,32	9,67	0,09
İZMİR DEMİR ÇELİK	8,15	0,99	1,51	9,29	-0,09	-0,69	-0,49	-4,44	-0,09
MENDERES TEKSTİL	2,86	0,71	1,36	7	-0,05	-0,15	-0,17	-2,85	-0,08
PERGAMON STATUS	0	0,012	25,93	0,05	0,009	0,15	0,69	4,02	0,77
SANKO	1499	1,77	7,26	10,16	0,05	0,09	0,46	4,34	0,03
SASA DIŞ TİC.	5	1,59	5,08	32,25	0,1	0,18	0,33	3,24	0,06
TGS AŞ	0,03	0,014	2,84	13,16	0,003	0,1	0,31	11,72	0,18

Table 9 2014 Ratio Results of Foreign Trade Capital Companies that Take Place in the BIST and Sustainability Index

FINANCIAL RATIOS	SDH	ADH	DVDH	HDDH	AK	ÖK	HBK	F/K	NK/NS
COMPANIES									
ARÇELİK	4,15	1	3,19	6,84	0,05	0,14	0,91	14,79	0,05
FORD OTOSAN	18,79	1,65	2,79	20,65	0,08	0,22	1,69	16,54	0,05
ŞİŞE CAM	3,75	0,56	1,03	2,48	0,03	0,06	0,24	10,36	0,06
TOFAŞ	17,9	1,04	2,25	1,35	0,08	0,26	1,15	11,82	0,08
TÜPRAŞ	13,2	1,81	2,66	10,19	0,07	0,23	5,83	7,31	0,04
TÜRK TRAKTÖR	5,26	1,42	4,58	10,11	0,14	0,38	5,02	12,07	0,1
VESTEL	7,35	1,51	5,78	14,27	0,08	0,2	0,69	16,67	0,06
BORUSAN	3,44	0,61	1,03	14,63	0,009	0,025	0,18	36,4	0,015
BOSCH	9,76	1,1	6,99	2,67	0,12	0,18	3,69	35,57	0,11
EREĞLİ DEMİR ÇELİK	2,72	0,72	1,34	5,25	0,1	0,15	0,46	7,43	0,14
İZMİR DEMİR ÇELİK	6,94	1,08	1,55	2097	-0,02	-0,07	-0,09	-27,92	-0,016
MENDERES TEKSTİL	3,23	0,78	2,12	4,85	0,03	0,08	0,1	6,87	0,04
PERGAMON STATUS	0	0,013	39,05	0,07	0,005	0,095	0,39	10,5	0,42
SANKO	962,6	1,85	8,9	10,33	0,04	0,07	0,41	4,35	0,02
SASA DIŞ TİC.	5,79	1,82	5,63	86,5	0,11	0,22	0,33	18,13	0,06
TGS AŞ	0	0,012	1,63	0,77	0,004	0,1	0,31	12,77	0,35

Table 10 2013 Ratio Results of Foreign Trade Capital Companies that Take Place in the BIST and Sustainability Index

FINANCIAL RATIOS	SDH	ADH	DVDH	HDDH	AK	ÖK	HBK	F/K	NK/NS
COMPANIES									
ARÇELİK	6,18	0,97	2,96	8,76	0,05	0,14	0,88	7,35	0,05
FORD OTOSAN	15,92	1,9	3,21	47,89	0,11	0,29	1,83	8,92	0,06
ŞİŞE CAM	3,81	0,52	0,88	3,05	0,04	0,07	0,27	5,38	0,07
TOFAŞ	16,29	1,19	2,77	1,37	0,07	0,23	0,87	10,05	0,06
TÜPRAŞ	11,66	1,94	3,61	11,21	0,06	0,23	4,78	6,17	0,03
TÜRK TRAKTÖR	4,8	1,45	5,32	10,39	0,19	0,38	5,24	7,31	0,13
VESTEL	6,78	1,5	5,2	109	0,04	0,1	0,28	8,94	0,03
BORUSAN	3,41	0,6	1,03	7,7	0,02	0,05	0,26	17,96	0,03
BOSCH	15,95	1,11	5,85	2,05	0,14	0,2	3,42	29,11	0,12
EREĞLİ DEMİR ÇELİK	2,54	0,69	1,22	12,85	0,065	0,11	0,26	7,38	0,09
İZMİR DEMİR ÇELİK	6,05	0,77	1,32	4,71	-0,05	-0,24	-0,31	-7,33	-0,07
MENDERES TEKSTİL	3,37	0,75	1,87	8,04	0,04	0,09	0,1	3,99	0,05
PERGAMON STATUS	0	0,01	32,62	0,24	0,01	0,49	1,43	2,35	0,92
SANKO	545	1,65	7,11	9,2	0,03	0,07	0,35	3,77	0,02
SASA DIŞ TİC.	4,93	1,67	5,06	1817	0,01	0,02	0,03	18,37	0,006
TGS AŞ	0,02	0,007	6,4	0,11	0,001	0,04	0,12	44	0,17

Table 11 Pre-Index and Post-Index Performance Rankings of Foreign Trade Capital Companies that Take Place in the BIST and Sustainability Index

YEARS		2017		2016		2015		2014		2013
RANKING	CC	TOPSIS	CC	TOPSIS	CC	TOPSIS	CC	TOPSIS	CC	TOPSIS
COMPANIES										
ARÇELİK	0,027	13	0,37	10	0,4163	11	0,276	14	0,237	11
FORD OTOSAN	0,136	7	0,406	7	0,4629	6	0,327	8	0,332	7
ŞİŞE CAM	0,014	15	0,334	14	0,368	14	0,227	15	0,197	15
TOFAŞ	0,073	9	0,387	9	0,433	10	0,31	10	0,278	9
TÜPRAŞ	0,267	3	0,397	8	0,493	5	0,364	5	0,335	6
TÜRK TRAKTÖR	0,117	8	0,451	5	0,495	4	0,41	3	0,417	2
VESTEL	0,212	6	0,47	3	0,458	7	0,318	9	0,239	10
BORUSAN	0,018	14	0,344	12	0,438	9	0,303	12	0,208	13
BOSCH	0,216	5	0,475	2	0,519	1	0,405	4	0,376	5
EREĞLİ DEMİR ÇELİK	0,06	10	0,35	11	0,383	13	0,283	13	0,23	12
İZMİR DEMİR ÇELİK	0,231	4	0,227	15	0,209	16	0,338	7	0,06	16
MENDERES TEKSTİL	0,043	12	0,087	16	0,271	15	0,219	16	0,202	14
PERGAMON STATUS	0,48	1	0,465	4	0,511	2	0,433	1	0,479	1
SANKO	0,44	2	0,493	1	0,503	3	0,416	2	0,384	3
SASA DIŞ TİC.	0,05	11	0,425	6	0,439	8	0,343	6	0,383	4
TGS AŞ	0,008	16	0,343	13	0,392	12	0,307	11	0,297	8

Table 12 *The Percentage Increase after the Comparative Analysis of Pre-Index and Post-Index Stock Prices of Foreign Trade Capital Companies that Take Place in the BIST and Sustainability Index*

YEARS	2013	2014	2015	2016	2017	TUTAR	% ARTIŞ
COMPANIES							
ARÇELİK	6,51	13,51	16,45	20,88	18,18	11,67	179,2627
FORD OTOSAN	16,3	28,04	30	32,84	59,41	43,11	264,4785
ŞİŞE CAM	1,48	2,52	2,65	3,58	4,98	3,5	236,4865
TOFAŞ	8,73	13,58	18,76	24,55	28,71	19,98	228,866
TÜPRAŞ	29,51	42,6	57,7	71,06	104,87	75,36	255,3711
TÜRK TRAKTÖR	38,36	60,65	63	69,33	72,5	34,14	88,99896
VESTEL	2,48	11,51	9,55	6,54	10,92	8,44	340,32
BORUSAN	4,66	6,45	6	8,88	13,47	8,81	189,0558
BOSCH	99,73	131,35	143,1	136,8	185,42	85,69	85,922
EREĞLİ DEMİR ÇELİK	1,94	3,4	3,11	5,48	10,6	8,66	446,39
İZMİR DEMİR ÇELİK	2,31	2,5	2,17	3,08	3,03	0,72	31,16883
MENDERES TEKSTİL	0,41	0,7	0,5	0,69	1,04	0,63	153,6585
PERGAMON STATUS	3,35	4,15	2,78	3,05	6,01	2,66	79,40299
SANKO	1,33	1,79	1,98	2,69	3,6	2,27	170,6767
SASA DIŞ TİC.	0,53	1,07	1,06	2,87	12,33	11,8	2226,415
TGS AŞ	5,12	3,91	3,71	3,83	4,38	-0,74	-14,4531

6. Conclusions and Evaluations

In this study, performance evaluations of Foreign Trade Capital Companies in BİST and Sustainability index were measured through the TOPSIS method. As a multi-criteria decision-making method, TOPSIS performs performance ranking according to the proximity and distance of the financial ratio outcomes of companies to the ideal and negative ideal solution. First of all, performance evaluations have been made according to whether the companies are in the sustainability index or not, however it has been seen that the two companies with the highest performance scores were out of the index. Then, taking into consideration the financial data between 2013 and 2017, whether there was any change in performance ranking before and after taking part in the index has been analyzed. According to the results obtained, it has been seen that there were still no shift in the ranking. Upon this, a comparative analysis has been run based on the stock prices of companies between 2013 and 2017. When 2015 was taken as the year the sustainability index was first put into service and 2013 was taken as the base year, it has been seen that the percentage increase in the stock prices of the index companies in 2017 has been ($\%247/\%165=1,50$) 1,5 times higher in comparison to the companies that do not take part in the index. Stock prices of companies have been calculated by taking the average of the first three months of the year in which the financial statements have been issued. In addition, outliers have been not taken into consideration when the mean of the percentage increases in stock prices is calculated.

Given the results obtained, it can be argued that taking place in the sustainability index increases stock prices even though it does not seem to create any surplus value in the financial statements of the companies. In addition, this situation increases the market value of the companies. Furthermore, rise in share prices will also trigger the demand for the shares of these companies. Increase in the demand not only depends on the price increase, but also on the fact that today's investors prefer companies with high social responsibility consciousness and sensitivity to the environment more when they both make investment and buy products.

The fact that there are a total of 44 firms in the sustainability index as of 2017, and that 7 of these are among Foreign Trade Capital Companies, shows that outward-oriented companies pay more attention to this issue.

In conclusion, while there has been no significant change in the short-term financial performances of the companies that take place in the sustainability index, there have been significant increases in their stock prices. Moreover, an increase in their stock returns will increase the demand for these firms' shares, facilitating them to find resources and grow up in the long run.

References

- Alpar, R. (2011). *Uygulamalı Çok Değişkenli İstatistiksel Yöntemler (Applied Multi-variate Statistical Methods)*. Third Edition, Detay Publishing, Ankara
- Ashtiani, B., Haghighirad, F., Makui, A., Montazer, G. (2009). *Extension of fuzzy TOPSIS method based on interval-valued fuzzy sets*. Appl. Soft Comput, 9, 457–461
- Behzadian, M., Otaghsara, S. K., Yazdani, M., & Ignatius, J. (2012). *A State-of the-Art Survey of TOPSIS Applications*. Expert Systems with Applications, 39, 13051-13069
- Bo, J., Haidong, L. (2008). *Research on Financial Early Warning for Listed Companies Based on TOPSIS Method*. <http://dergipark.gov.tr/download/article-file/432769>
- Boran, F. Gene, S. Kurt, M. Akay, D. (2009). *A multi-criteria intuitionistic fuzzy group decision making for supplier selection with TOPSIS method*. Expert Syst. Appl., 36, 11363–11368
- Brundtland Report. (1987). *Our Common Future*. <http://www.un-documents.net/our-common-future.pdf>
- Büker, S., Aşıkoğlu, R., Sevil G. (2008). *Finansal Yönetim (Financial Management)*. 4 Edition, Sözkese Printing, Ankara
- Bülbül, S., & Köse, A. (2011). *Türk Gıda Şirketlerinin Finansal Performansının Çok Amaçlı Karar Verme Yöntemleriyle Değerlendirilmesi, (An Evaluation of the Financial Performance of Turkish Food Companies through Multi-Purpose Decision Making Methods)* Atatürk Ü. İİBF Journal, 10. Econometrics and Statistics Symposium Special Volume
- Ceylan, A., Korkmaz, T. (2015). *İşletmelerde Finansal Yönetim (Financial Management in Firms)*, Ekin Publishing, 14. Edition, Bursa
- Christofi, A., Christofi, P., Sisaye, S. (2012). *Corporate sustainability: Historical development and reporting practices*. Management Research Review 35(2):157-172
- Çonkar, K., Elitaş, C., & Atar, G. (2011). *İMKB Kurumsal Yönetim Endeksi'ndeki (XKURY) Firmaların Finansal Performanslarının TOPSIS Yöntemi İle Ölçümü ve Kurumsal Yönetim Notu İle Analizi (Measurement of the Financial Performances and Analysis with the Management Grade of Companies Traded in the Management Index (XKURY) of IMKB)*. İstanbul Üniversitesi İktisat Fakültesi Mecmuası, (Istanbul University Journal of Faculty of Economics), 61 (1)
- Demireli, E. (2010). *Topsis Çok Kriterli Karar Verme Sistemi: Türkiye'deki Kamu Bankaları Üzerine Bir Uygulama (Multi-Criteria Decision-Making System: An Application on the Public Banks in Turkey)*. Girişimcilik ve Kalkınma Dergisi, (Journal of Entrepreneurship and Development) 5, 101-112
- Eyüboğlu, K. (2015). *Comparison of Developing Countries ' Macro Performances with AHP and TOPSIS Methods*. Çankırı Karatekin Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi (Journal of Çankırı Karatekin University Faculty of Economic and Administrative Sciences) 2016(1), 1–16

- Feng, C.-M., & Wang, R.-T. (2000). *Performance evaluation for airlines including the consideration of financial ratios*, Journal of Air Transport Management, 6(3), 133-142
- He, Y.Y., Gong, Z.W. (2012). *Extension of TOPSIS for intuitionistic fuzzy multiple attribute decision making and experimental analysis*. Adv. Inf. Sci. Serv. Sci., 4, 397-405
- Herzig, C., & Schaltegger, S. (2006). *Reporting External Accounting Frameworks and Benchmarking: Corporate Sustainability Reporting*. An Overviev. Sustainability Accounting and Reporting. (Ed: S. Schaltegger, M. Bennet and R. Burrit). Netherlands, Dordrecht: Springer, 301-324
- Isaksson, R., & Steimle, U. (2009). *What Does Gri-Reporting Tell Us About Corporate Sustainability?* The TQM Journal, 21(2). 168-181
- Kim, G.-J., & Suhee (2011). *Exploiting The Decision-Making Tecnique to Explore The Relationship Between The Financial Factors and The Stock Preference*, <http://ieomsociety.org/ieom2011/pdfs/IEOM067.pdf> (02.11.16)
- Lazol, İ. (2010). *Mali Analiz Uygulamaları (Financial Analysis Applications)*, Ekin Publishing, 5. Edition, Bursa
- Liu, S. Yu, F. Xu, W., & Zhang, W. (2013). *New approach to MCDM under interval-valued intuitionistic fuzzy environment*. Int. J. Mach. Learn. Cybern. 4, 671-678
- Lin, M. C., Wang, C. C., Chen, M. S., & Chang, C. A. (2008). *Using AHP and TOPSIS approaches in customer-driven product design process*. Computers in Industry, 59(1), 17-31
- Mandic, K., Delibasic, B., Knezevic, S., & Benkovic, S. (2014). *Analysis of the financial parameters of Serbian banks through the application of the fuzzy AHP and TOPSIS methods*. Economic Modelling, 43, 30-37
<http://doi.org/10.1016/j.econmod.2014.07.036>
- Özcan, T., Elebi, N., & Esnaf, A. (2011). *Comparative analysis of multi-criteria decision making methodologies and implementation of a warehouse location selection problem*. Expert Systems with Applications, 38(8), 9773-9779
- Salmi, T., & Martikainen, T. (1994). *A Review of the Theoretical and Empirical Basis of Financial Ratio Analysis*. The Finnish Journal of Business Economics, 4(94), 426-448
- Supçiller, A. A., & Çapraz, O. (2011). *AHP-TOPSIS Yöntemine Dayalı Tedarikçi Seçimi Uygulaması ("A Supplier Selection Application based on the AHP-TOPSIS Method")* Ekonometri ve İstatistik (Econometrics and Statistics) 13
- Şimşek, Ş., Çelik, A. (2013). *İşletme Bilimine Giriş (Introduction to the Science of Business Administration)*. Eğitim Publishing, Konya
- Urfalıoğlu, F., & Genç, T. (2013). *Çok Kriterli Karar Verme Teknikleri ile Türkiye'nin Ekonomik Performansının Avrupa Birliği Üye Ülkeleri ile Karşılaştırılması. (A Comparison of Turkey's Economic Performance with those of the EU Countries using Multi-Criteria Decision-Making Techniques)*. Marmara University Journal of Economic & Administrative Sciences, 35(2), 329-360
- Ünal, S., & Yüksel, R. (2017). *Finansal Performans ve Hisse Senedi Getirisi İlişkisi: Bist Sürdürülebilirlik Endeksindeki Bankalar Üzerine Bir İnceleme (The Relationship Between Financial Performance and Stock Exchange Profits: An Examination on the Banks in the BİST Sustainability Index)*. Uluslararası Yönetim İktisat ve İşletme Dergisi, ICMEB17 Özel Sayısı Int. Journal of Management Economics and Business, ICMEB17 Special Issue, 266)
- Wang, T.-C., & Hsu, J-C. (2004). *Evaluation of The Business Operation Performance of The Listing Companies by Applying TOPSIS Method*. IEEE International Conference on Systems, Man and Cybernetics, Sayı: 2, 1286-1291
- Wanke, P., Azad, M. D. A. K., & Barros, C. P. (2016). *Predicting efficiency in Malaysian Islamic banks: A two-stage TOPSIS and neural networks approach*. Research in

International Business and Finance, 36, 485–498

<http://doi.org/10.1016/j.ribaf.2015.10.002>

- Yalçın, N., Bayrakdaroglu, A., & Kahraman, C. (2012). *Application of Fuzzy Multi-Criteria Decision Making Methods for Financial Performance Evaluation of Turkish Manufacturing Industries*. Expert Systems with Applications, Volume 39, 350–364
- Yue, Z. (2011). *An extended TOPSIS for determining weights of decision makers with interval numbers*. Knowl. Based Syst. 24, 146–153
- Yurdakul M., & İç, Y. T. (2003). *Türk Otomotiv Firmalarının Performans Ölçümü ve Analizine Yönelik Topsis Yöntemini Kullanan Bir Örnek Çalışma (An Example Study Using the TOPSIS Method toward the Performance Measurement of Turkish Automotive Companies)*. Gazi Üniversitesi Mühendislik ve Mimarlık Fakültesi Dergisi, (Journal of Gazi University Faculty of Architecture and Engineering) 18(1)
- Zsolnai, L. (2002). *Green Business or Community Economy?* International Journal of Economics, 29(8), 652-662
<http://www.borsaistanbul.com/data/kilavuzlar/surdurulebilirlik-rehberi.pdf>.



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