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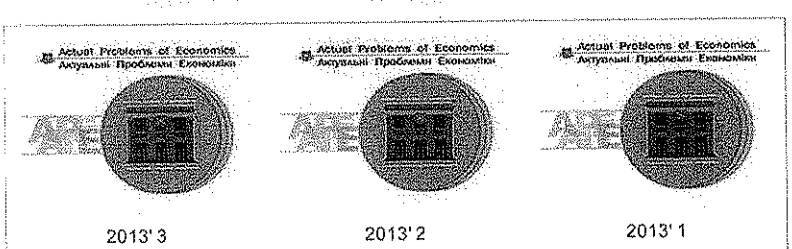

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A RESEARCH ON DETERMINATION OF THE FINANCIAL PERFORMANCES OF TOURISM COMPANIES TRADED IN ISTANBUL STOCK EXCHANGE

Hasan Uygurturk[1], Turhan Korkmaz[2], Hilal Uygurturk[3]

Abstract

In this study, financial performances of seven tourism businesses whose shares are traded in the Istanbul Stock Exchange (ISE) are analyzed with ELECTRE method, which is one of the multicriteria decision making methods. For that purpose, 10 financial ratios which explain financial performance of businesses are determined and financial ratios are calculated for each business by using ratio analysis method for the period 2007-2011. Financial ratios which are calculated for the businesses are turned into a point that shows general business performance by using ELECTRE method. Then, calculated performance scores are used for the businesses' ranking.

Keywords: financial performance, tourism sector, ratio analysis, ELECTRE.

JEL codes: L25, L83.

1. Introduction. Remaining over working time, people's desire for having a trip, keeping time for themselves, taking a rest, recreation, doing physical exercise and a desire for improving their cultural background form the basis of tourism activities. The continuity of these interests provides tourism to be one of the most important sectors which has a high growth rate in the world. The steady increase of the tourism activities and tourism revenues make the sector more important as it is an effective instrument in economic growth and development.

Considering the number of people participating in tourism activities throughout the world, international tourist arrivals have shown virtually uninterrupted growth: from 25 million in 1950, to 277 million in 1980, to 435 million in 1990, to 675 million in 2000, and to the current 940 million. As growth rate has been particularly high in the world's emerging regions, the share in international tourist arrivals received by emerging and developing economies has steadily risen from 31% in 1990 to 47% in 2010 (UNWTO, 2011:2). The decline of prices and the passion for discovering the undiscovered has played a major role for the increase of this ratio with the increase in transportation and communication by means of advances in technology,

Large amounts of investment are made in tourism sector, which is the major revenue building element of national economies that are growing rapidly. Tourism sector is a source for income, foreign exchange, and employment and its utilization of the investments, and all these play a crucial role for investing enterprises as well as the investing country. Therefore,

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the performances of the tourism enterprises in a country have the same importance for investors, researchers and public authorities.

In this study, it is aimed to determine the financial performance of the tourism enterprises which are operating in Turkey and whose shares are traded in ISE, via ELECTRE method.

Accurate decisions about the future can be possible with the correct analysis and interpretation of the past activities. Decisions made within this framework will reduce the risks and loses to a minimum level as long as they are made objectively and scientifically. The operating enterprises' healthy decision-making, planning and the control function makes it inevitable to make financial analysis regularly in the tourism sector, which especially has a dynamic structure and where there is an intense competition. For this reason, one of the most important responsibilities of the business managers of acting enterprises in tourism sector is the measurement and analysis of the financial performance.

2. Literature Review. ELECTRE methods have numerous application areas such as energy, finance, project selection, transportation, agriculture, and military.

Buchanan and Sheppard (1998), illustrated a real application of project selection for a business firm, using ELECTRE method. Ok (2006), made an activity selection using a multi-criteria decision model based on an ELECTRE method for the planning of Igneada's ecotourism.

Soner and Onut (2006), mentions that a firm that produce ventilation and air conditioner apply ELECTRE and AHP methods for a specific product in supplier selection by using data about supplier. Milani, Shanian and El-Lahham (2006), using a sample case study within an organization, shows how different versions of ELECTRE methods can be used in choosing efficient strategies that account for both human behavioral resistance and technical elements. Almeida (2007) used ELECTRE method as a decision support system for outsourcing contracts selection.

Ozden (2009), used multiple decision making method such as TOPSIS, ELECTRE, PROMETHEE and VIKOR in the financial performance of banks in the financial analysis, and indicated that, this method can be used for classification of banks according to their financial statements. Bulbul and Kose (2009) used both TOPSIS and ELECTRE methods in the evaluation of financial performance of companies in all sectors in food industry.

Atici and Ulucan (2009) used two contemporary decision analysis techniques, ELECTRE and PROMETHEE in Turkish energy industry. Cagil (2011) makes in her study the financial performance evaluation of private and public capital deposit banks and foreign capital banks in Turkey between the terms of 2006–2010 is targeted with the usage of ELECTRE Method.

Ergul and Oktem (2011) aimed at testing accurate usability of TOPSIS and ELECTRE methods at financial performance measurement and evaluation of firms which are acting in "Construction and Public Works Sector" that have significant role in Turkey economy, in their study. Ok, Okan and Yilmaz (2011), used the AHP, ELECTRE I and III methods for the selection of ecotourism planning activity.

3. Data and Research Methodology

3.1. Firms Included in the Study and Analysis Period. This study's data set consists of seven tourism firms that are ISE listed between the years 2007-2011 and their financial tables can be reached without interruption. Accordingly, the five year period covering the years 2007-2011 with complete data, the annual financial statements of these seven tourism firms are obtained from ISE and Public Disclosure Platform (PDP) official websites (ISE, 2012; PDP, 2012).

Firms included in the study are shown in Table 1.

Table 1. **Tourism Firms Traded on the ISE**

ISE Code	Firms Name
AYCES	ALTINYUNUS ÇEŞME TURİSTİK TESİSLER A.Ş.
FVORI	FAVORİ DİNLENME YERLERİ A.Ş.
MAALT	MARMARİS ALTINYUNUS TURİSTİK TESİSLER A.Ş.
MARTI	MARTI OTEL İŞLETMELERİ A.Ş.
METUR	METEMTUR OTELCİLİK VE TURİZM İŞLETMELERİ A.Ş.
NTTUR	NET TURİZM TİCARET VE SANAYİ A.Ş.
TEKTU	TEK-ART TURİZM ZİGANA A.Ş.

3.2. Financial Ratios. Ratio analysis is a method which gives information about companies' financial structure, asset efficiency, usage of foreign source and profitability by making mathematical contact with account and groups of account that are found in fiscal tables. In first stage of this study, financial ratios that can reveal financial performance of companies successfully are determined with literature search. Financial ratios that are used in the analysis and their calculation methods are shown in Table 2.

Table 2. **Financial Ratios Used in the Research**

Current Ratio (CR)	Current Assets/Current Liabilities
Liquidity Ratio (LR)	(Current Assets–Inventories)/Current Liabilities
Dept to Total Assets (DTA)	Total Dept/Total Assets
Equity to Total Assets (ETA)	Equity/Total assets
Fixed Assets Turnover Ratio (FATR)	Net Sales/Net Fixed Assets
Asset Turnover Ratio (ATR)	Net Sales/Total Assets
Working Capital Turnover Ratio (WCTR)	Net Sales/Working Capital
Return on Equity (ROE)	Net profit/Equity
Return on Assets (ROA)	Net Profit/Total Assets
Net Profit to Net Sales Ratio (NPNS)	Net Profit/Net Sales

Financial ratios used in the research are defined as following;

Current Ratio: This ratio is the ratio of current assets to current liabilities. A higher ratio indicates a stronger ability of paying current debts (Ergul and Oktem, 2011:1091).

Liquidity Ratio: This ratio is calculated by deducting inventories from current assets and then dividing the remaining by current liabilities.

Debt to Total Assets: This ratio measures the percentage of the firm's assets that is financed with debt.

Equity to Total Assets: This ratio measures amount of assets funded by sources of equity capital.

Fixed Assets Turnover Ratio: This ratio is computed as dividing net sales by the firm's net fixed assets, and it indicates that how much long-term assets are being used to produce sales (Melicher and Norton, 2011:393).

Asset Turnover Ratio: This ratio indicates how effectively a firm uses its total resources to generate sales, and it is a summary measure influenced by each activity ratios (Ergul and Oktem, 2011:1091)

Working Capital Turnover Ratio: This ratio highlights the effective utilization of working capital with regard to sales, and represents the firm's liquidity position (Periasamy, 2007:50).

Return on Equity (ROE) Ratio: This ratio measures the ratio of net profit to equity. It is major indicator of how well the enterpriser uses investors' funds to generate profits and indicates the rate at which the firm's value is growing (Gartner and Bellamy, 2010:432).

Return on Assets (ROA): This ratio measures how productively a company uses its assets to generate profits.

Net Profit to Net Sales Ratio: This ratio measures the percentage of each sales dollar remaining after all expenses including taxes, have been deducted.

3.3. ELECTRE Method. The acronym ELECTRE stands for: ELimination Et Choix Traduisant la REalité (Elimination and Choice Translating Reality). ELECTRE method was proposed by Benayoun, Roy and Sussman in 1966, and it was developed and improved by Roy in 1971. ELECTRE concentrates the analysis on the dominance relations among the alternatives. The basic concept of ELECTRE is how to deal with outranking relation by using pair-wise comparisons among alternatives under each criteria separately (Wang et al., 2009:2275).

Different versions of ELECTRE have been developed including ELECTRE I, II, III, IV and TRI. All methods are based on the same fundamental concepts but differ both operationally and according to the type of the decision problem (Marzouk, 2010:596).

ELECTRE method includes seven-step process of a solution. Steps of the ELECTRE method are described below.

Step 1: Determining the Decision Matrix (A). Decision matrix is formed in the first step of the method. In this matrix, the rows indicate alternatives and columns indicate the value of criteria for each alternative.

$$A_{ij} = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ . & . & . & . \\ . & . & . & . \\ . & . & . & . \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{bmatrix}$$

Here, m shows the number of alternatives and n shows the number of criteria values.

Step 2: Calculation of the Normalized Decision Matrix (X). This procedure transforms various units in the decision matrix into dimensionless comparable units by using the following Equation (1) (Dodangh et al., 2010:270).

$$x_{ij} = \frac{a_{ij}}{\sqrt{\sum_{i=1}^{m} a_{ij}^2}} \qquad i = 1, \dots, m \qquad j = 1, \dots, n \tag{1}$$

Therefore, the normalized matrix X is defined as follows:

$$X_{ij} = \begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix}$$

Where m is the number of alternatives and n is the number of criteria, and X_{ij} is the new and dimensionless preference measure of the i-th alternative in terms of the j-th criterion (Triantaphyllou et al., 1998:175-186).

Step 3: Calculation of the Weighted Normalized Decision Matrix (V). The column of the X matrix is then multiplied by its associated weights which were assigned to the criteria by the decision maker. Thus the weighted matrix depends on normalized matrix assigned to it is given by: $V_{ij} = w_j * x_{ij}$.

$$V_{ij} = \begin{bmatrix} w_1x_{11} & w_2x_{12} & \cdots & w_nx_{1n} \\ w_1x_{21} & w_2x_{22} & \cdots & w_nx_{2n} \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ w_1x_{m1} & w_2x_{m2} & \cdots & w_nx_{mn} \end{bmatrix}$$

Where $0 \leq w_1, w2, \ldots, wn \leq 1$ or $\sum_{j=1}^{n} w_j = 1$. The weights of the attributes are expressed by these constants.

Step 4: Determining the Concordance and Discordance Sets. The concordance set C_{pq} of two alternatives A_p and A_q (1, 2, …, m and $p \neq q$), is defined as the set of all criteria for which A_p is preferred to Aq . That is, the following is true:

$C_{(p,q)} = \{j, \text{ such that: } V_{pj} \geq V_{qj}\}$, for j = 1, 2, 3, ..., n.

The complementary subset is called the discordance set and it is described as follows:

$D_{(p,q)} = \{j, \text{ such that: } V_{pj} < V_{qj}\}$, for j = 1, 2, 3, ..., n.

Step 5: Calculation of Concordance and Discordance Indexes. The relative power of each concordance set is measured by means of the concordance index. The concordance index C_{pq} represents the degree of confidence in the pair wise judgments of (A_p, A_q). The concordance index of $C_{(p,q)}$ is defined as:

$$C_{pq} = \sum_{j^*} w_j. \qquad (2)$$

Where j^* are attributes which belong to concordance set $C_{(p,q)}$. On the other hand, the discordance index, measures the power of $D_{(p,q)}$. The discordance index of $D_{(p,q)}$, which indicates the degree of disagreement in (A_p, A_q), can be defined as:

$$D_{pq} = \frac{\max \left| V_{pj} - V_{qj} \right|, j \in D_{(p,q)}}{\delta} \qquad (3)$$

Where V_{pj} indicates the performance of alternative A_p in terms of criterion C_j, and $\delta = \sum_j \left| V_{pj} - V_{qj} \right|, j = 1,2,3,....,n$.

Step 6: Outrank the Relationships. A higher concordance index C_{pq} and a lower discordance index D_{pq} means the dominance relationship of alternative A_p becomes stronger over alternative A_q. When the $C_{pq} \geq \overline{C}$ and $D_{pq} \leq \overline{D}$, that represents A_p outranks A_q ($A_p \rightarrow A_q$). Here, $\overline{C}$ and $\overline{D}$ are the averages of C_{pq} and D_{pq} respectively.

Step 7: Calculation of Net Concordance and Discordance Indexes. The application of the method proceeds with the calculation of the net concordance and discordance indexes, where the net concordance index constitutes a measure of relative dominance of an alternative A_p over other alternatives when compared with a measure of dominance of other alternatives over the alternative A_p and a net discordance index provides a measure of relative weakness of alternative A_p over other alternatives when compared with a measure of weakness of other alternatives over alternative A_p (Charilas et al., 2009:69). The net concordance and discordance indexes are calculated by equations (4) and (5) as follows:

$$C_p = \sum_{\substack{k=1 \\ k \neq p}}^{m} C_{pk} - \sum_{\substack{k=1 \\ k \neq p}}^{m} C_{kp} \tag{4}$$

$$D_p = \sum_{\substack{k=1 \\ k \neq p}}^{m} D_{pk} - \sum_{\substack{k=1 \\ k \neq p}}^{m} D_{kp} \tag{5}$$

Obviously, an alternative A_p has a greater preference with a higher C_p and a lower D_p. Hence the final selection should satisfy the condition that its net concordance index should be at a maximum and its net discordance index at a minimum. If both these conditions are not satisfied, the alternative that scores the highest average rank can be selected as the final solution (Yoon and Hwang, 1995:53).

4. Empirical Results. The financial ratios that competed for each enterprise in the analysis are used for determining the financial performances of the enterprises for 2007, 2008, 2009, 2010 and 2011 years separately. Competed financial ratios are turned into one point that shows the general performance of the enterprise via ELECTRE method. Then, the enterprises are ranked and the performance measurement is completed.

Step 1: Determining the Decision Matrix (A). In the first stage of research, 10 financial ratios which explain financial performance of firms are determined and financial ratios are calculated for each firm by using ratio analysis method. In the test usability of ELECTRE method of firms included in the analysis; decision matrices are formed separately for the 2007, 2008, 2009, 2010 and 2011 years by using financial ratios that are determined in the previous step. In decision matrices, decision points (firms) are placed in the lines and valuation factors (financial ratios) which used in decision making are placed in the columns. There are seven decision points and ten valuation factors in this study (7x10). Accordingly, decision matrix of 2011 for the firms that are included in this study are shown in Table 3. As an example, data from the year 2011 are shown in the tables.

Table 3. **2011 Decision Matrix (A)**

2011	Valuation Factors (Financial Ratios)									
Firms	CR	LR	DTA	ETA	FATR	ATR	WCTR	ROE	ROA	NPNS
AYCES	0,895	0,895	0,178	0,822	0,176	0,168	3,588	0,000	-0,006	-0,036
FVORI	0,543	0,474	0,896	0,104	0,071	0,065	0,748	0,639	0,066	1,019
MAALT	7,424	7,424	0,113	0,887	0,391	0,320	1,763	0,087	0,077	0,242
MARTI	1,224	0,678	0,508	0,492	0,322	0,216	0,656	-0,041	-0,020	-0,093
METUR	1,930	1,843	1,033	-0,033	1,596	0,044	0,045	8,337	-0,099	-1,252
NTTUR	0,357	0,258	0,263	0,737	0,110	0,101	1,211	0,094	0,069	0,690
TEKTU	9,376	9,376	0,053	0,947	0,086	0,067	0,301	0,017	0,016	0,244

Step 2: Calculation of the Normalized Decision Matrix (X). The normalized decision matrix that is in Table 4 is constructed by using elements of A matrix in Table 3 and equation (1).

Table 4. **The Normalized Decision Matrix (X)**

2011	Valuation Factors (Financial Ratios)									
Firms	CR	LR	DTA	ETA	FATR	ATR	WCTR	ROE	ROA	NPNS
AYCES	0,073	0,074	0,119	0,463	0,104	0,377	0,834	0,001	-0,038	-0,020
FVORI	0,044	0,039	0,598	0,058	0,042	0,146	0,174	0,076	0,414	0,569
MAALT	0,607	0,610	0,075	0,499	0,231	0,719	0,410	0,010	0,482	0,135
MARTI	0,100	0,056	0,339	0,277	0,190	0,485	0,152	-0,005	-0,125	-0,052
METUR	0,158	0,151	0,689	-0,018	0,944	0,099	0,011	0,997	-0,618	-0,699
NTTUR	0,029	0,021	0,175	0,415	0,065	0,226	0,281	0,011	0,433	0,385
TEKTU	0,767	0,771	0,036	0,533	0,051	0,151	0,070	0,002	0,102	0,136

Step 3: Calculation of the Weighted Normalized Decision Matrix (V). In the third step, weighted normalized values are calculated by weighted degree of evaluation factors multiplied by normalized values computed in the previous step.

While weighted degree of the evaluation factors are calculated, primarily, columns values of each factor (CR, LR, DTA ect.) in Table 4 that belongs to seven firms are collected. Then, the calculated values of these factors are collected and consequently the total factor value is computed. Finally, the weights of the evaluation factors are calculated by dividing the sum of column in each criterion to the total value of the criteria. Accordingly, the weights of the evaluation factors in 2011 are calculated below:

$w_1 = 0{,}113$, $w_2 = 0{,}110$, $w_3 = 0{,}129$, $w_4 = 0{,}142$, $w_5 = 0{,}104$, $w_6 = 0{,}140$, $w_7 = 0{,}123$, $w_8 = 0{,}069$, $w_9 = 0{,}041$, $w_{10} = 0{,}029$

Table 5. **2011 the Weighted Normalized Decision Matrix (V)**

2011	Valuation Factors (Financial Ratios)									
Firms	CR	LR	DTA	ETA	FATR	ATR	WCTR	ROE	ROA	NPNS
AYCES	0,008	0,008	0,015	0,066	0,011	0,053	0,102	0,000	-0,002	-0,001
FVORI	0,005	0,004	0,077	0,008	0,004	0,021	0,021	0,005	0,017	0,016
MAALT	0,069	0,067	0,010	0,071	0,024	0,101	0,050	0,001	0,020	0,004
MARTI	0,011	0,006	0,044	0,039	0,020	0,068	0,019	0,000	-0,005	-0,002

2011	Valuation Factors (Financial Ratios)									
Firms	CR	LR	DTA	ETA	FATR	ATR	WCTR	ROE	ROA	NPNS
METUR	0,018	0,017	0,089	-0,003	0,098	0,014	0,001	0,069	-0,026	-0,020
NTTUR	0,003	0,002	0,023	0,059	0,007	0,032	0,035	0,001	0,018	0,011
TEKTU	0,087	0,084	0,005	0,076	0,005	0,021	0,009	0,000	0,004	0,004

Step 4: Determining the Concordance and Discordance Sets. The concordance (C) and discordance (D) clusters are established for each pair-wise comparison of alternatives. A letter is determined for each firm for representation of concordance and discordance clusters to provide simplicity. Accordingly, AYCES (A), FVORI (B), MAALT (C), MARTI (D), METUR (E), NTTUR (F) and TEKTU (G) are represented by these letters.

For example, AYCES (A) and FVORI (B) firms' concordance (C) and discordance (D) clusters are shown below:

$$C(A,B) = (1,2,4,5,6,7) \quad D(A,B) = (3,8,9,10)$$

The concordance (C) and discordance (D) clusters of all firms are shown in Table 6.

Table 6. **The Concordance (C) and Discordance (D) Clusters**

Concordance Clusters		Discordance Clusters	
C (A,B)	(1,2,4,5,6,7)	D (A,B)	(3,8,9,10)
C (A,C)	(3,7)	D (A,C)	(1,2,4,5,6,8,9,10)
C (A,D)	(2,4,7,8,9,10)	D (A,D)	(1,3,5,6)
C (A,E)	(4,6,7,9,10)	D (A,E)	(1,2,3,5,8)
C (A,F)	(1,2,4,5,6,7)	D (A,F)	(3,8,9,10)
C (A,G)	(3,5,6,7)	D (A,G)	(1,2,4,8,9,10)
C (B,A)	(3,8,9,10)	D (B,A)	(1,2,4,5,6,7)
C (B,C)	(3,8,10)	D (B,C)	(1,2,4,5,6,7,9)
C (B,D)	(3,7,8,9,10)	D (B,D)	(1,2,4,5,6)
C (B,E)	(4,6,7,9,10)	D (B,E)	(1,2,3,5,8)
C (B,F)	(1,2,3,8,10)	D (B,F)	(4,5,6,7,9)
C (B,G)	(3,7,8,9,10)	D (B,G)	(1,2,4,5,6)
C (C,A)	(1,2,4,5,6,8,9,10)	D (C,A)	(3,7)
C (C,B)	(1,2,4,5,6,7,9)	D (C,B)	(3,8,10)
C (C,D)	(1,2,4,5,6,7,8,9,10)	D (C,D)	(3)
C (C,E)	(1,2,4,6,7,9,10)	D (C,E)	(3,5,8)
C (C,F)	(1,2,4,5,6,7,9)	D (C,F)	(3,8,10)
C (C,G)	(3,5,6,7,8,9)	D (C,G)	(1,2,4,10)
C (D,A)	(1,3,5,6)	D (D,A)	(2,4,7,8,9,10)
C (D,B)	(1,2,4,5,6)	D (D,B)	(3,7,8, 9,10)
C (D,C)	(3)	D (D,C)	(1,2,4,5,6,7,8,9,10)
C (D,E)	(4,6,7)	D (D,E)	(1,2,3,5,8,9,10)
C (D,F)	(1,2,3,5,6)	D (D,F)	(4,7,8,9,10)
C (D,G)	(3,5,6,7)	D (D,G)	(1,2,4,8,9,10)
C (E,A)	(1,2,3,5,8)	D (E,A)	(4,6,7,9,10)
C (E,B)	(1,2,3,5,8)	D (E,B)	(4,6,7,9,10)
C (E,C)	(3,5,8)	D (E,C)	(1,2,4,6,7,9,10)

Concordance Clusters		Discordance Clusters	
C (E,D)	(1,2,3,5,8,9,10)	D (E,D)	(4,6,7)
C (E,F)	(1,2,3,5,8)	D (E,F)	(4,6,7,9,10)
C (E,G)	(3,5,8)	D (E,G)	(1,2,4,6,7,9,10)
C (F,A)	(3,8,9,10)	D (F,A)	(1,2,4,5,6,7)
C (F,B)	(4,5,6,7,9)	D (F,B)	(1,2,3,8,10)
C (F,C)	(3,8,10)	D (F,C)	(1,2,4,5,6,7,9)
C (F,D)	(4,7,8,9,10)	D (F,D)	(1,2,3,5,6)
C (F,E)	(4,6,7,9,10)	D (F,E)	(1,2,3,5,8)
C (F,G)	(3,5,6,7,8,9,10)	D (F,G)	(1,2,4)
C (G,A)	(1,2,4,8,9,10)	D (G,A)	(3,5,6,7)
C (G,B)	(1,2,4,5,6)	D (G,B)	(3,7,8,9,10)
C (G,C)	(1,2,4,10)	D (G,C)	(3,5,6,7,8,9)
C (G,D)	(1,2,4,8,9,10)	D (G,D)	(3,5,6,7)
C (G,E)	(1,2,4,6,7,9,10)	D (G,E)	(3,5,8)
C (G,F)	(1,2,4)	D (G,F)	(3,5,6,7,8,9,10)

Step 5: Calculation of Concordance and Discordance Indexes. In the fifth step, the concordance and discordance indexes are calculated by using concordance and discordance clusters. Accordingly, C (A,B) concordance index 0,732 and D (A,B) discordance index 0,358 are found. The concordance (C) and discordance (D) indexes of all firms are shown in Table 7.

Table 7. **The Concordance (C) and Discordance (D) Indexes**

Concordance Indexes		Discordance Indexes	
C (A,B)	0,732	D (A,B)	0,358
C (A,C)	0,252	D (A,C)	0,786
C (A,D)	0,514	D (A,D)	0,322
C (A,E)	0,475	D (A,E)	0,496
C (A,F)	0,731	D (A,F)	0,262
C (A,G)	0,496	D (A,G)	0,553
C (B,A)	0,269	D (B,A)	0,642
C (B,C)	0,228	D (B,C)	0,791
C (B,D)	0,392	D (B,D)	0,554
C (B,E)	0,475	D (B,E)	0,625
C (B,F)	0,450	D (B,F)	0,534
C (B,G)	0,392	D (B,G)	0,665
C (C,A)	0,748	D (C,A)	0,214
C (C,B)	0,772	D (C,B)	0,209
C (C,D)	0,871	D (C,D)	0,120
C (C,E)	0,698	D (C,E)	0,369
C (C,F)	0,772	D (C,F)	0,076
C (C,G)	0,607	D (C,G)	0,200
C (D,A)	0,486	D (D,A)	0,678
C (D,B)	0,608	D (D,B)	0,446
C (D,C)	0,129	D (D,C)	0,880

Concordance Indexes		Discordance Indexes	
C (D,E)	0,405	D (D,E)	0,687
C (D,F)	0,596	D (D,F)	0,467
C (D,G)	0,496	D (D,G)	0,650
C (E,A)	0,525	D (E,A)	0,504
C (E,B)	0,525	D (E,B)	0,375
C (E,C)	0,302	D (E,C)	0,631
C (E,D)	0,595	D (E,D)	0,313
C (E,F)	0,525	D (E,F)	0,424
C (E,G)	0,302	D (E,G)	0,535
C (F,A)	0,269	D (F,A)	0,738
C (F,B)	0,550	D (F,B)	0,466
C (F,C)	0,228	D (F,C)	0,924
C (F,D)	0,404	D (F,D)	0,533
C (F,E)	0,475	D (F,E)	0,576
C (F,G)	0,636	D (F,G)	0,702
C (G,A)	0,504	D (G,A)	0,447
C (G,B)	0,608	D (G,B)	0,335
C (G,C)	0,393	D (G,C)	0,800
C (G,D)	0,504	D (G,D)	0,350
C (G,E)	0,698	D (G,E)	0,465
C (G,F)	0,364	D (G,F)	0,298
Total	21		21
Average	0,50		0,50

Step 6: Outrank the Relationships. Primarily, C and D indices' average value $\left(\overline{C} = 0{,}50 \text{ and } \overline{D} = 0{,}50\right)$ are calculated for a comparison of dominance. Then, the analyze processes are carried out in accordance with the rule of $C_{pq} \geq \overline{C}$ and $D_{pq} \leq \overline{D}$, that represents A_p outranks A_q ($A_p \rightarrow A_q$).

Table 8. **Outrank the Relationships**

	C_{pq}	$C_{pq} \geq \overline{C}$		D_{pq}	$D_{pq} \leq \overline{D}$	$A_p \rightarrow A_q$
C_{AB}	0,732	Yes	D_{AB}	0,358	Yes	$A \rightarrow B$
C_{AC}	0,252	No	D_{AC}	0,786	No	No
C_{AD}	0,514	Yes	D_{AD}	0,322	Yes	$A \rightarrow D$
C_{AE}	0,475	No	D_{AE}	0,496	Yes	No
C_{AF}	0,731	Yes	D_{AF}	0,262	Yes	$A \rightarrow F$
C_{AG}	0,496	No	D_{AG}	0,553	No	No
C_{BA}	0,269	No	D_{BA}	0,642	No	No
C_{BC}	0,228	No	D_{BC}	0,791	No	No
C_{BD}	0,392	No	D_{BD}	0,554	No	No
C_{BE}	0,475	No	D_{BE}	0,625	No	No
C_{BF}	0,450	No	D_{BF}	0,534	No	No
C_{BG}	0,392	No	D_{BG}	0,665	No	No
C_{CA}	0,748	Yes	D_{CA}	0,214	Yes	$C \rightarrow A$

	$\mathbb{C}_{pq}$	$C_{pq} \geq \overline{C}$		$\mathbb{D}_{pq}$	$D_{pq} \leq \overline{D}$	$A_p \rightarrow A_q$
C_{CB}	0,772	Yes	D_{CB}	0,209	Yes	$C \rightarrow B$
C_{CD}	0,871	Yes	D_{CD}	0,120	Yes	$C \rightarrow D$
C_{CE}	0,698	Yes	D_{CE}	0,369	Yes	$C \rightarrow E$
C_{CF}	0,772	Yes	D_{CF}	0,076	Yes	$C \rightarrow F$
C_{CG}	0,607	Yes	D_{CG}	0,200	Yes	$C \rightarrow G$
C_{DA}	0,486	No	D_{DA}	0,678	No	No
C_{DB}	0,608	Yes	D_{DB}	0,446	Yes	$D \rightarrow B$
C_{DC}	0,129	No	D_{DC}	0,880	No	No
C_{DE}	0,405	No	D_{DE}	0,687	No	No
C_{DF}	0,596	Yes	D_{DF}	0,467	Yes	$D \rightarrow F$
C_{DG}	0,496	No	D_{DG}	0,650	No	No
C_{EA}	0,525	Yes	D_{EA}	0,504	No	No
C_{EB}	0,525	Yes	D_{EB}	0,375	Yes	$E \rightarrow B$
C_{EC}	0,302	No	D_{EC}	0,631	No	No
C_{ED}	0,595	Yes	D_{ED}	0,313	Yes	$E \rightarrow D$
C_{EF}	0,525	Yes	D_{EF}	0,424	Yes	$E \rightarrow F$
C_{EG}	0,302	No	D_{EG}	0,535	No	No
C_{FA}	0,269	No	D_{FA}	0,738	No	No
C_{FB}	0,550	Yes	D_{FB}	0,466	Yes	$F \rightarrow B$
C_{FC}	0,228	No	D_{FC}	0,924	No	No
C_{FD}	0,404	No	D_{FD}	0,533	No	No
C_{FE}	0,475	No	D_{FE}	0,576	No	No
C_{FG}	0,636	Yes	D_{FG}	0,702	No	No
C_{GA}	0,504	Yes	D_{GA}	0,447	Yes	$G \rightarrow A$
C_{GB}	0,608	Yes	D_{GB}	0,335	Yes	$G \rightarrow B$
C_{GC}	0,393	No	D_{GC}	0,800	No	No
C_{GD}	0,504	Yes	D_{GD}	0,350	Yes	$G \rightarrow D$
C_{GE}	0,698	Yes	D_{GE}	0,465	Yes	$G \rightarrow E$
C_{GF}	0,364	No	D_{GF}	0,298	Yes	No

According to the information in Table 8, 19 dominance relationships of alternatives are observed in 42 comparisons of dominance. Accordingly, firm A has superiority over firm B, D and F, firm C has superiority over firm A, B, D, E, F and G, firm D has superiority over firm B and F, firm E has superiority over firm B, D and F, firm F has superiority over firm B, firm G has superiority over firm A, B, D and E. These situations are shown in Figure 1.

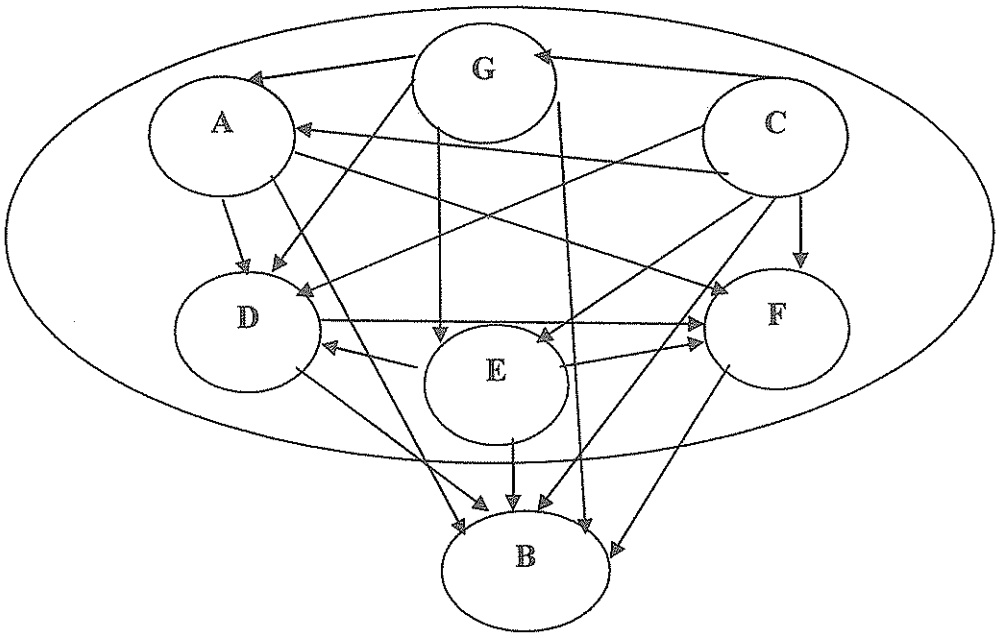

Figure 1. **Advantages of Firms**

Step 7: Calculation of Net Concordance and Discordance Indexes. Net concordance and discordance indexes are calculated to determine which alternative is more dominant than the other. Net concordance index (Cp) and net discordance index (Dp) calculations are presented below:

Net concordance indexes:

$C_A = (C_{AB} + C_{AC} + C_{AD} + C_{AE} + C_{AF} + C_{AG}) - (C_{BA} + C_{CA} + C_{DA} + C_{EA} + C_{FA} + C_{GA}) = 0,398$

$C_B = (C_{BA} + C_{BC} + C_{BD} + C_{BE} + C_{BF} + C_{BG}) - (C_{AB} + C_{CB} + C_{DB} + C_{EB} + C_{FB} + C_{GB}) = -1,589$

$C_C = (C_{CA} + C_{CB} + C_{CD} + C_{CE} + C_{CF} + C_{CG}) - (C_{AC} + C_{BC} + C_{DC} + C_{EC} + C_{FC} + C_{GC}) = 2,935$

$C_D = (C_{DA} + C_{DB} + C_{DC} + C_{DE} + C_{DF} + C_{DG}) - (C_{AD} + C_{BD} + C_{CD} + C_{ED} + C_{FD} + C_{GD}) = -0,560$

$C_E = (C_{EA} + C_{EB} + C_{EC} + C_{ED} + C_{EF} + C_{EG}) - (C_{AE} + C_{BE} + C_{CE} + C_{DE} + C_{FE} + C_{GE}) = -0,450$

$C_F = (C_{FA} + C_{FB} + C_{FC} + C_{FD} + C_{FE} + C_{FG}) - (C_{AF} + C_{BF} + C_{CF} + C_{DF} + C_{EF} + C_{GF}) = -0,878$

$C_G = (C_{GA} + C_{GB} + C_{GC} + C_{GD} + C_{GE} + C_{GF}) - (C_{AG} + C_{BG} + C_{CG} + C_{DG} + C_{EG} + C_{FG}) = 0,144$

Net disconcordance indexes:

$D_A = (D_{AB} + D_{AC} + D_{AD} + D_{AE} + D_{AF} + D_{AG}) - (D_{BA} + D_{CA} + D_{DA} + D_{EA} + D_{FA} + D_{GA}) = -0,445$

$D_B = (D_{BA} + D_{BC} + D_{BD} + D_{BE} + D_{BF} + D_{BG}) - (D_{AB} + D_{CB} + D_{DB} + D_{EB} + D_{FB} + D_{GB}) = 1,621$

$D_C = (D_{CA} + D_{CB} + D_{CD} + D_{CE} + D_{CF} + D_{CG}) - (D_{AC} + D_{BC} + D_{DC} + D_{EC} + D_{FC} + D_{GC}) = -3,624$

$D_D = (D_{DA} + D_{DB} + D_{DC} + D_{DE} + D_{DF} + D_{DG}) - (D_{AD} + D_{BD} + D_{CD} + D_{ED} + D_{FD} + D_{GD}) = 1,614$

$D_E = (D_{EA} + D_{EB} + D_{EC} + D_{ED} + D_{EF} + D_{EG}) - (D_{AE} + D_{BE} + D_{CE} + D_{DE} + D_{FE} + D_{GE}) = -0,435$

$D_F = (D_{FA} + D_{FB} + D_{FC} + D_{FD} + D_{FE} + D_{FG}) - (D_{AF} + D_{BF} + D_{CF} + D_{DF} + D_{EF} + D_{GF}) = 2,303$

$D_G = (D_{GA} + D_{GB} + D_{GC} + D_{GD} + D_{GE} + D_{GF}) - (D_{AG} + D_{BG} + D_{CG} + D_{DG} + D_{EG} + D_{FG}) = -0,611$

The calculated net concordance indexes (Cp) are sorted by descending order and net disconcordance indexes (Dp) are sorted by ascending order. Accordingly, the generated ranking is shown in Table 9.

Table 9. **Cp and Dp Values and Rankings (2011)**

Firms Code	C_p Value	Rankings	D_p Value	Rankings
A	0,398	2	-0,445	3
B	-1,589	7	1,621	6
C	2,935	1	-3,624	1
D	-0,560	5	1,614	5
E	-0,450	4	-0,435	4
F	-0,878	6	2,303	7
G	0,144	3	-0,611	2

Table 10 includes 2007-2011 analysis period values of C_p and D_p and performance rankings of the firms that are made according to these values.

Table 10. **C_p and D_p Values and Performance Rankings of the Tourism Firms**

Firms Code	2007				2008				2009				2010				2011			
	C	Rankings	D	Rankings	C	Rankings	D	Rankings	C	Rankings	D	Rankings	C	Rankings	D	Rankings	C	Rankings	D	Rankings
A	-1,826	6	1,695	5	0,086	4	1,007	5	-1,419	5	-0,140	4	-0,198	5	0,021	4	0,398	2	-0,445	3
B	-2,432	7	2,380	6	-7,229	7	1,117	7	-5,325	7	1,641	6	-4,213	7	2,486	7	-1,589	7	1,621	6
C	1,411	2	-1,509	2	3,798	2	0,953	4	3,619	2	-2,340	1	3,774	1	-2,818	1	2,935	1	-3,624	1
D	1,121	3	-0,805	4	5,275	1	1,015	6	4,002	1	-0,880	3	1,120	2	0,528	5	-0,560	5	1,614	5
E	2,635	1	-3,319	1	-2,744	5	-1,471	2	-2,158	6	-1,445	2	-0,951	6	-0,358	3	-0,450	4	-0,435	4
F	-0,332	4	-0,853	3	-2,970	6	-1,097	3	0,464	4	2,886	7	0,637	3	0,886	6	-0,878	6	2,303	7
G	-0,578	5	2,411	7	3,783	3	-1,523	1	0,817	3	0,278	5	-0,168	4	-0,745	2	0,144	3	-0,611	2

According to Table 10, A-coded firm takes place near the end in the year 2007, but in the years 2008, 2009 and 2010 generally is in the front line when compared to the year 2007. In the year 2011, the A-coded firm is in the best sort value during the analysis period. B-coded firm takes the last place in all the analysis period and shows low performance when compared to other firms. C-coded firm generally exhibits superior performance over the analysis period, especially in the years 2010 and 2011, it has continued its success by taking in the first place.

D-coded firm achieves a better ranking value in the midterm of the analysis period when compared to the year 2007. But D-coded firm cannot continue this upward trend and it obtains low-order values towards the end of the analysis period. E-coded firm generally shows a downward trend in the rankings after the year 2007. F-coded firm takes mid-rank place during the analysis period. However, F-coded firm shows low performance in the year 2011 and it takes low order place. G-coded firm, compared to previous years, increases the performance by achieving a better ranking value towards the end of the analysis period.

5. Conclusion. This study is aimed at testing accurate usability of ELECTRE method at financial performance measurement, and evaluation of firms which are operating in tourism sector.

As a result of the study, according to the calculated Cp and Dp values of firms in the analysis period, A and G coded firms increase their performance and D, E, and F coded firms decrease their performance. In the analysis period, B-coded firm generally took place in the lower ranks and its low performance position did not change so much. C coded firm has high and close performance ranking values during the period in general.

ELECTRE method provides an objective valuation opportunity for the decision-makers. Therefore, the results of this study provide information to business executives about the financial performance status of business operating in the tourism sector. Also, the analysis results of the firms will help existing or potential investors to make decision.

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