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Cash Flow Based Financial Performance of Borsa İstanbul Tourism Companies by Entropy-MAIRCA Integrated Model

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ABSTRACT

The cash flow of a company is a key element for the firm value. The firm value of a company is depending largely on the ability to generate cash flows. In other words, a company's firm value is calculated by using cash flows. Financial performance analysis helps companies in effective decision-making, planning, and auditing functions. Traditional ratio analysis uses the statement of financial position (balance sheet) and the profit and loss statement (income statement) to measure financial performance. However, the income statement of a company just shows the accounting profits. Depending on this, traditional ratios can sometimes be over or underestimated on measuring financial performances. To provide a better picture of a company's financial strength and measure sensitive financial performance cash flow ratios were suggested instead of traditional ratios. Within this context, the aim of this study is to measure and compare the financial performance of Borsa İstanbul (BIST) tourism companies with the use of cash flow based ratios. Ten tourism companies listed on BIST were evaluated by the Entropy-MAIRCA hybrid model. To achieve this, cash flow based eleven ratios were calculated within the indicators of liquidity, efficiency, profitability, and solvency (leverage). To calculate ratios a-year balance sheet, additionally, income statement and cash flow statement table gathered from Public Disclosure Platform. Findings of the Entropy method showed that the most important criteria were cash ratio, cash to sales, and cash to long term debts. According to the ranking results obtained by the MAIRCA method, the best tourism company is E. It was followed by G and D.

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1. Introduction

Financial performance analysis helps companies in effective decision-making, planning and auditing functions. With financial performance analysis, a holistic perspective can actually be provided on companies' performance (Coşkun 2007; Aydeniz 2009; Ecer, 2013; Ecer and Günay, 2014; Ulutagay et al., 2015; Deo, 2016). Income statement provides information about a company's operating results. The measurement of income is one of the important functions of financial accounting. Stakeholders such as investors, managers, lenders, bankers are interested in companies' income statement and financial results. The earnings and cash flows would lead to consistent decisions if it were not for the fact that earnings are affected by many accounting conventions, such as expense versus capitalization decisions and the choice of a depreciation method (Bierman, 2010: 85).

Likely actual cash flow of the firm is the most important item. Cash flow statement explain the change in accounting cash and equivalents (Ross, Westerfield and Jaffe, 2008: 29). The Financial Accounting Standards Board (FASB) described the primary purpose of cash flow statement as providing relevant information about a company's cash receipts and payments during a period. The statement of cash flow used by stakeholders to assess a company's ability to generate future net cash flows, to meet its obligations and pay dividends, and its needs for external financing. Cash flow statement also prove the reasons for difference between net income and related cash receipts and payments. On the other side, by statement of cash flows if used with related disclosures and other financial statements information it is possible to assess the effects on a company's financial position not only of its cash but also noncash investing and financing transactions during a fiscal period. (FASB, 1987).

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Research Paper

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The cash flows of a company are received from three activities. Cash flows such as net income, and changes in current assets and liabilities (other than financing activities), etc. related to operating activities are called as Cash Flows from Operating Activities or Operating Cash Flows. Net capital expenditure which is the sum of inflows from sales of fixed assets and outflows from acquisition of fixed assets is called as Cash Flows from Investing Activities or Investing Cash Flows. Changes in equity and debt is the third classification of cash flows called as Cash Flows from Financing Activities (FASB, 1987; Ross et al., 2008: 33-34).

A decision may be characterized by its effect on accounting earnings as well as by its incremental cash flows (Bierman, 2010: 5). Barua and Saha (2015) showed that economic crises in Bangladesh as well as abnormal condition of stock market are caused due to the manipulation of accounting data for consecutive financial year. The study also indicated that cash flow ratios are providing the better predictive power rather than traditional ratios, and accurate picture of companies. Fawzi, Kamaluddin and Sanusi (2015: 143) suggest that cash flow ratios are reliable tools for predicting financial distress. Cash flow statement ratios also provide a better picture of a company's financial strength and profitability (Carslaw and Mills, 1991: 63). Traditionally many auditors take into account balance sheet and income statement but cash flow statement and cash flow based ratios should be used for an effective auditing (Mills and Yamamura, 1998: 53). Studies that use cash flow ratios put forth the importance and more sensitive tool and method is that the cash flow statement analysis (e.g. Carslaw and Mills, 1991; Mills and Yamamura, 1998; Barua and Saha, 2015; Fawzi et al., 2015; Deo, 2016; Das, 2018).

The aim of the study is to measure and compare Turkish tourism companies' cash flow based financial performance by using Entropy-MAIRCA hybrid model. For this purpose, the study is organized into five section. The following section encapsulate the review of the relevant literature. The third section covers the research methodology, and section four includes findings. The last section provides the general evaluation of study findings.

2. Literature Review

Studies in the sample of tourism companies mostly realized by using traditional ratios for the financial performance in different countries and sub-sectors (e.g. Kim, 2006; Ecer and Günay, 2014; Erdoğan, 2018). Some researches which outlined below revealed the importance of cash flow ratios and analyzing the cash flow statements. Although the number of studies based on cash flow ratios is limited, no study in the tourism sector example has been encountered. Under this constraint, some studies are summarized below.

Largay and Stickney (1980) examined what if used by investors cash flow information of companies are beneficial. In a company example it was investigated if cash flows provide an early signals to investors about the problems. It was proved that inability to generate operating cash flows warns investors about problems. This means if an investor needs any information about a company's performance should analyze company cash flows.

In the study conducted by Carslaw and Mill (1991), which is one of the pioneering studies, they had been suggested ratios to analyze and evaluate corporate cash flows. Giocomino and Mielke (1993) suggested cash flow ratios to analyze financial statements in the context of performance evaluation. They argued that the cash flow ratios can be used in terms of sufficiency and efficiency of companies. Besides traditional ratios, they proposed the cash flow based ratios can be used for relative performance evaluation. Mills and Yamamura (1998) argued that for an effective audit the use of cash flow statement and ratios based on cash flows should be taken into account by auditors.

Ryu and Jang (2014) examined the performance of commercial hotel and casino hotel companies by using both cash flow ratios and traditional financial ratios. Five ratios have been calculated within the liquidity, solvency, and operational efficiency as financial performance indicators. The study covers five years, the period from 1998 to 2002. Findings of the study put forth that traditional ratios generated different results from cash flow based ratios in liquidity.

Barua and Saha (2015) compared the traditional and cash flow ratios of Bangladeshi listed non-manufacturing companies. Income statement based and cash flow based ratios were calculated by using the data obtained from the tables. Study covers 10 years from 2001 to 2010. Results show that cash flow and accrual component of earnings can be used to predict future cash flows, and cash flows have better predictive power than income statement based ratios. They also found that cash flow ratios are sometimes providing better and accurate picture of companies. One another contribution of the study to literature is to support the potential of cash flow based ratios to serve as

an early warning of financial distress and bankruptcy.

Fawzi et al. (2015) aimed to examine cash flow ratios in determining companies' financial distress. For this purpose, 52 distressed and 52 non-distressed Malaysian companies analyzed by using logistic regression analysis. The data covers the years 2009-2012. According to the study results five cash flow ratios are significant predictors of financial distress with the overall predictive accuracy of 82.1 percent. The study reveals that cash flow ratios are a reliable tool in predicting financial distress.

Başar and Azgın (2016) presented the difference of income statement and cash flow statement and analyzes the cash flow statement by using the ratios and free cash flows. The study carried out for retail companies quoted in BIST and was aimed to analyze cash flows by ratios and to find correlation between the cash flows. The examined data cover the years 2010-2014. Findings of the study showed that a small portion of the sales of retail companies returns as operating cash flows. In the study it was obtained correlations between the operating cash flow, free cash flow and sales profitability are low and negative. So this result implies that the companies seems profitable but could not create the cash flow that is needed.

Das (2018) investigated a company's financial performance in the context of liquidity, solvency, profitability and efficiency by use of cash flow ratios. He calculated fourteen ratio for the years 2004-2013. The findings of the study showed that the investigated company had problems with profitability but was good enough to maintain liquidity, solvency and sufficiency.

Güleç and Bektaş (2019) performed a study by using eight fundamental cash flow ratios and ten traditional ratios comparatively within the scope of liquidity, profitability and financial structure to demonstrate the power of cash flow statement. The study was realized in the sample of 107 non-financial companies from seven sub-sectors in manufacturing industry listed on BIST. According to results, they have revealed that examined manufacturing companies cash quality is not good enough and have problems with liquidity. The study also support literature that cash flow based ratios provide more beneficial information than traditional ratios about liquidity of a company.

Çavuş and Başar (2020) who investigated whether the cash flow ratios have the explanatory power in predicting the financial failure, examined Borsa İstanbul Manufacturing sector for 2018. In the study, logistic regression analysis method was used for predicting financial failure through cash flow ratios. To determine financial failure, the Altman-Z score was calculated for the year 2018. To explain the power of cash flow ratios to predict financial failure of 2018, fourteen cash flow ratios have used. Each ratios were examined for each year 2015, 2016 and 2017, separately. It was concluded in the study that cash flow based ratios are effective in predicting financial failure.

Dereköy (2020) aimed to reveal whether there is a difference between the traditional ratios and cash flow ratios in measuring liquidity and solvency. For the purpose of study, 22 companies were examined which are traded on Borsa İstanbul and listed in Textile, Weaving Apparel and Leather sector. The study covers the period of 2013-2017. Four ratios calculated for each method and used t-test statistic to determine difference. According to the findings of the study, accrual based traditional ratios and cash flow based ratios give statistically different results in assessment of liquidity and solvency.

3. Research Methodology

Traditional ratios have been used for many years but not enough to measure financial performance. Investors and other stakeholders need to have a beneficial information about a company's financial position. So cash flow based ratios were suggested instead of traditional ratios to measure companies' financial statement more sensitive. In light of this information, the aim of this study is to measure and compare the cash flow based financial performance of tourism companies listed on BIST in the context of cash flow based ratios by Entropy-MAIRCA hybrid model.

Data and Variables

Tourism is one of a key sector in Turkey closing the trade and foreign exchange deficit. Despite this importance of sector, there are not many companies listing in stock exchange. In Turkey twelve companies from the sector of restaurants and hotels are listed on stock exchange. The study covers the recent available year of statements. The list of tourism companies quoted in BIST was shown in Table 1.

There are twelve companies in BIST restaurants and hotels sector. Two companies in which one does not have operating activities (ULAS) and the other does not have appropriate data to analyze (METUR) have not included in the study sample.

Table 1. The list of codes and companies quoted in BIST

Code	Company Name
AYCES	Altın Yunus Çeşme Turistik Tesisler A.Ş.
AVTUR	Avrasya Petrol ve Turistik Tesisler Yatırımlar A.Ş.
ETILR	Etiler Gıda ve Ticari Yatırımlar Sanayi ve Ticaret A.Ş.
KSTUR	Kuştur Kuşadası Turizm Endüstri A.Ş.
MAALT	Marmaris Altınyunus Turistik Tesisler A.Ş.
MARTI	Martı Otel İşletmeleri A.Ş.
MERIT	Merit Turizm Yatırım ve İşletme A.Ş.
METUR*	Metemtur Otelcilik ve Turizm İşletmeleri A.Ş.
PKENT	Petrokent Turizm A.Ş.
TEKTU	Tek-Art İnşaat Ticaret Turizm Sanayi ve Yatırımlar A.Ş.
ULAS*	Ulaşlar Turizm Yatırımları ve Dayanıklı Tüketim Malları Ticaret Pazarlama A.Ş.
UTPYA	Utopya Turizm İnşaat İşletmecilik Ticaret A.Ş.
** It has not been included in the analysis due to observation deficiencies and incompatibility.*	

Source: Authors

Financial statements of the companies for 2018 were obtained from Public Disclosure Platform. Balance sheet, income statement and cash flow statement were used to generate cash flow based ratios. Although various ratios based on cash flows were suggested in literature (e.g. Carslaw and Mill, 1991; Giocomino and Mielke, 1993; etc.), we use eleven ratios compiled from literature (Mills and Yamamura, 1998; Ibarra, 2009 in Başar and Azgın, 2016; Barua and Saha, 2015; Fawzi et al., 2015; Güleç and Bektaş, 2019) in the context of four indicators to measure Turkish tourism companies performance. Table 2 shows the list and calculation method of ratios used in the study.

Data Analysis

According to FAS 95 in a statement of cash flows shall classify cashes as resulting from operating, investing and financing activities (FASB, 1987). Depending on the purpose of the statement of cash flow analysis it is possible to generate many ratios. But in this study only operating cash flow-based ratios were analysed. Other cash flow ratios can be calculated in case of the need of analysis. When fundamental operating cash flow based ratios in Table 2 are examined mostly expected to be high. With this information to determine the performance of tourism companies, we propose a novel Entropy-MAIRCA integrated model. Thus, we introduces these methods briefly in following section.

Shannon's entropy method

In this paper, Shannon's entropy method is used to calculate the weights of the criteria objectively. Thus, the steps for deciding criteria weights based on entropy method are as followings (Ecer, 2019).

Step 1: Determining of decision matrix

$$A = \begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix} \quad (1)$$

(i = 1, 2,..., m; j = 1, 2,..., n) is the performance value of the ith alternative to the jth criterion.

Step 2: Standardization of criteria

Table 2. The list and calculation method of cash flow ratios used in the study

Ratio	Method of calculation	Decision Criterion
Liquidity		
Operating Cash Flow Ratio (OCFR)	= CFFO / STD	40% or more
Cash Ratio (CR)	= Cash / STD	Expected to be upward trend and high
Efficiency		
Cash Return on Assets (CROA)	= CFFO/Total Assets	Expected to be upward trend and high
Cash Return on Fixed Assets (CROFA)	= CFFO/Fixed Assets	Expected to be upward trend and high
Cash Turnover (CTO)	= Cost of Sales/Cash	Expected to be upward trend and high
Profitability		
Cash to Net Profit (CNP)	= CFFO/Net Profit	Expected to be upward trend and high
Cash to Sales (CTS)	= CFFO/Sales	Expected to be upward trend and high
Cash to Equity Employed (CTEE)	= CFFO/(LTD+Equity)	Expected to be upward trend and high
Leverage		
Cash to Long Term Debts (CTLTD)	= CFFO/LTD	Expected to be upward trend and high
Cash to Equity (CTE)	= CFFO/Equity	Expected to be upward trend and high
Cash per Share (CPS)	= CFFO/Number of Shares	Expected to be upward trend and high
CFFO: Cash Flow from Operating Activities; STD: Short-Term Debt; LTD: Long-Term Debt		

Source: Authors

$$r_{ij} = x_{ij} \Big/ \max_j x_{ij} \quad (2)$$

$$r_{ij} = \min_j x_{ij} \Big/ x_{ij} \quad (3)$$

While Eq. (2) used for benefit-type criteria, Eq. (3) utilized for cost-type criteria. After standardization of criteria, the standardized criterion matrix is $R = \lfloor r_{ij} \rfloor_{mxn}$

Step 3: Calculation of entropy

$$e_j = -\frac{\sum_{i=1}^{m} f_{ij} \ln f_{ij}}{\ln m} \quad (4)$$

wherein:

$$f_{ij} = \frac{r_{ij}}{\sum_{i=1}^{m} r_{ij}}$$

Step 4: Calculation of the weight of entropy

$$w_j = \frac{1 - e_j}{n - \sum_{j=1}^{n} e_j} \quad (5)$$

MAIRCA method

Since the MAIRCA method is utilized to rank the tourism companies in this work, we first mentioned its steps (Gigovic et al., 2016; Ecer, 2020; Hashemkhani Zolfani et al., 2020).

Step 1. Construct the initial matrix and normalization matrix. Linear normalization is preferred for normalization i.e. (Value – $\text{Value}_{\text{min}}$)/($\text{Value}_{\text{max}}$ – $\text{Value}_{\text{min}}$).

Step 2. Determine the preferences.

$$P_{A_i} = \frac{1}{m} \qquad \sum_{i=1}^{m} P_{A_i} = 1 \quad (6)$$

where m is the number of alternatives. In MAIRCA, the expert is neutral towards the alternatives. So, Eq. (7) can be written.

$$P_{A_1} = P_{A_2} = \ldots = P_{A_m} \quad (7)$$

Step 3. Calculate theoretical evaluation matrix.

$$T_p = \begin{bmatrix} w_1.t_{p11} & w_2.t_{p12} & \cdots & w_n.t_{p1n} \\ w_1.t_{p21} & w_2.t_{p22} & \cdots & w_n.t_{p2n} \\ \vdots & \vdots & \ddots & \vdots \\ w_1.t_{pm1} & w_2.t_{pm2} & \cdots & w_n.t_{pmn} \end{bmatrix} \quad (8)$$

Step 4. Form the real evaluation matrix.

$$t_{rij} = t_{pij}.\left(\frac{x_{ij} - x_i^-}{x_i^+ - x_i^-}\right) \quad (9)$$

$$t_{rij} = t_{pij}.\left(\frac{x_i^+ - x_{ij}}{x_i^+ - x_i^-}\right) \quad (10)$$

Whilst Eq. (9) is handled for normalization of benefit-type criteria, Eq. (10) used for normalization of cost-type criteria.

Step 5. Construct the total gap matrix.

$$G = \begin{bmatrix} t_{p11} - t_{r11} & t_{p12} - t_{r12} & \cdots & t_{p1n} - t_{r1n} \\ t_{p21} - t_{r21} & t_{p22} - t_{r22} & \cdots & t_{p2n} - t_{r2n} \\ \vdots & \vdots & \ddots & \vdots \\ t_{pm1} - t_{rm1} & t_{pm2} - t_{rm2} & \cdots & t_{pmn} - t_{rmn} \end{bmatrix} \quad (11)$$

Step 6. Calculate the criteria functions (Q_i) for the alternatives.

$$Q_i = \sum_{j=1}^{n} g_{ij} \quad (12)$$

Alternatives are ranked from the smallest to the largest as to their Q_i values. That is, the best alternative is the one with the smallest Q_i value.

4. Findings

Results of Shannon's Entropy

As mentioned before, we used Entropy method to calculate criteria weights in this study.

Step 1. Cash flow ratios (as criteria) as to tourism companies can be seen in Table 3. This table is also called initial decision matrix.

Step 2. By using Eq. (2), we realize standardization of criteria. Table 4 presents standardized values.

Step 3. In the last step of Entropy method, we first calculate the *fij* values as shown in Table 5.

After calculations, we get the weights of criteria as shown in Table 6. As a result, CR is the most

important ratio with 0.1769, followed by CTS with 0.123 and CTLTD with 0.1207, respectively.

Results of MAIRCA

Step 1. MAIRCA is also consider Table 3 as an initial matrix. Moreover, Table 7 shows the normalized matrix.

Step 2. Since we have 10 alternatives (m=10), we can get the preferences by dividing all the weights of the criteria by 10. Thus, Table 8 gives the preferences.

Step 3-4. By multiplying the preferences and normalized matrix, the real evaluation matrix is built. This matrix can be display in Table 9.

Step 5. Once we apply the steps of it, we get the total gap matrix presented by Table 10.

Step 6. Applying Eq. (12), we reached ranking order of tourism companies shown as Table 11. Therefore, E, G, and D are the most effective tourism companies, whereas C, I, and J are the worst. Fig. 1 can show the results better.

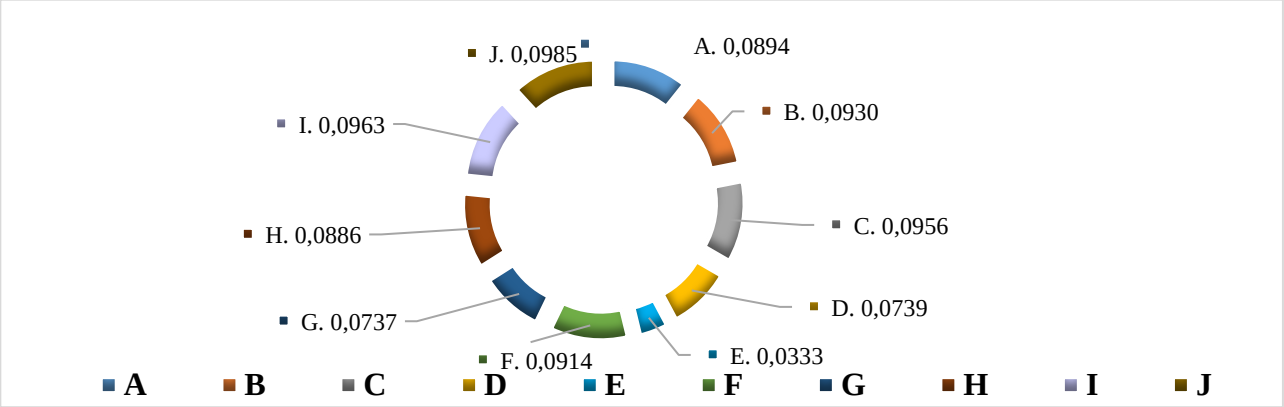

Figure 1. Qi values of firms

Source: Authors

Table 3. Initial decision matrix*

Firms	OCFR	CR	CROA	CROFA	CTO	CNP	CTS	CTEE	CTLTD	CTE	CPS
A	0.4778	0.0674	0.0509	0.0521	17.3606	20.5976	0.2623	0.0569	0.3885	0.0667	0.0058
B	0.0402	0.0007	0.0119	0.0140	297.9586	1.2615	0.2449	0.0123	0.0925	0.0142	0.0269
C	0.1165	0.0027	0.0488	0.0544	89.6254	0.2509	0.2790	0.0840	0.7221	0.0950	0.1183
D	1.4924	3.1971	0.2218	0.4827	0.5770	1.5884	0.4032	0.2606	26.6612	0.2631	0.0304
E	9.6027	15.5865	0.4685	1.9637	0.0209	6.1101	15.6739	0.4925	0.9710	0.9995	0.1286
F	0.1819	0.3897	0.0650	0.0755	0.4659	0.2855	0.5658	0.1011	0.1163	0.7727	0.7150
G	2.1027	0.0018	0.2332	0.2800	98.6466	2.2282	1.1044	0.2623	7.1548	0.2723	4.3163
H	0.0774	0.0236	0.0428	0.0920	46.1257	2.2587	0.0424	0.0958	0.8993	0.1073	3.1259
I	0.5303	0.0046	0.0328	0.0353	70.8845	0.0460	1.2405	0.0349	0.1607	0.0446	0.0015
J	0.0354	0.0157	0.0127	0.0146	28.8538	0.6804	0.0567	0.0199	0.0366	0.0435	0.1776

Table 4. Standardized values*

Firms	OCFR	CR	CROA	CROFA	CTO	CNP	CTS	CTEE	CTLTD	CTE	CPS
A	0.0498	0.0043	0.1086	0.0265	0.0583	1.0000	0.0167	0.1156	0.0146	0.0667	0.0013
B	0.0042	0.0000	0.0255	0.0071	1.0000	0.0612	0.0156	0.0250	0.0035	0.0142	0.0062
C	0.0121	0.0002	0.1041	0.0277	0.3008	0.0122	0.0178	0.1705	0.0271	0.0951	0.0274
D	0.1554	0.2051	0.4735	0.2458	0.0019	0.0771	0.0257	0.5290	1.0000	0.2633	0.0070
E	1.0000	1.0000	1.0000	1.0000	0.0001	0.2966	1.0000	1.0000	0.0364	1.0000	0.0298
F	0.0189	0.0250	0.1387	0.0384	0.0016	0.0139	0.0361	0.2053	0.0044	0.7731	0.1656
G	0.2190	0.0001	0.4978	0.1426	0.3311	0.1082	0.0705	0.5325	0.2684	0.2724	1.0000
H	0.0081	0.0015	0.0914	0.0469	0.1548	0.1097	0.0027	0.1946	0.0337	0.1073	0.7242
I	0.0552	0.0003	0.0700	0.0180	0.2379	0.0022	0.0791	0.0709	0.0060	0.0447	0.0004
J	0.0037	0.0010	0.0272	0.0074	0.0968	0.0330	0.0036	0.0403	0.0014	0.0435	0.0411
	1.526369	*1.237588*	*2.536668*	*1.560437*	*2.183253*	*1.714143*	*1.267916*	*2.883808*	*1.3954*	*2.680288*	*2.003152*

*** Source:** Authors

Table 5. f_{ij} values*

Firms	OCFR	CR	CROA	CROFA	CTO	CNP	CTS	CTEE	CTLTD	CTE	CPS
A	0.0326	0.0035	0.0428	0.0170	0.0267	0.5834	0.0132	0.0401	0.0104	0.0249	0.0007
B	0.0027	0.0000	0.0100	0.0046	0.4580	0.0357	0.0123	0.0087	0.0025	0.0053	0.0031
C	0.0079	0.0001	0.0411	0.0178	0.1378	0.0071	0.0140	0.0591	0.0194	0.0355	0.0137
D	0.1018	0.1657	0.1867	0.1575	0.0009	0.0450	0.0203	0.1835	0.7166	0.0982	0.0035
E	0.6552	0.8080	0.3942	0.6408	0.0000	0.1731	0.7887	0.3468	0.0261	0.3731	0.0149
F	0.0124	0.0202	0.0547	0.0246	0.0007	0.0081	0.0285	0.0712	0.0031	0.2884	0.0827
G	0.1435	0.0001	0.1962	0.0914	0.1516	0.0631	0.0556	0.1847	0.1923	0.1016	0.4992
H	0.0053	0.0012	0.0360	0.0300	0.0709	0.0640	0.0021	0.0675	0.0242	0.0400	0.3615
I	0.0362	0.0002	0.0276	0.0115	0.1090	0.0013	0.0624	0.0246	0.0043	0.0167	0.0002
J	0.0024	0.0008	0.0107	0.0048	0.0444	0.0193	0.0029	0.0140	0.0010	0.0162	0.0205

Table 6. Weights of criteria*

	OCFR	**CR**	**CROA**	**CROFA**	**CTO**	**CNP**	**CTS**	**CTEE**	**CTLTD**	**CTE**	**CPS**
$\mathbf{e_j}$	0.5087	0.1256	0.7549	0.5358	0.6917	0.6018	0.3919	0.8028	0.4032	0.7335	0.5064
$\mathbf{w_j}$	0.0994	0.1769	0.0496	0.0939	0.0624	0.0806	0.1230	0.0399	0.1207	0.0539	0.0998

Table 7. Normalized matrix*

Firms	OCFR	CR	CROA	CROFA	CTO	CNP	CTS	CTEE	CTLTD	CTE	CPS
A	0.046	0.004	0.085	0.020	0.058	1.000	0.014	0.093	0.013	0.053	0.001
B	0.001	0.000	0.000	0.000	1.000	0.059	0.013	0.000	0.002	0.000	0.006
C	0.008	0.000	0.081	0.021	0.301	0.010	0.015	0.149	0.026	0.082	0.027
D	0.152	0.205	0.460	0.240	0.002	0.075	0.023	0.517	1.000	0.253	0.007
E	1.000	1.000	1.000	1.000	0.000	0.295	1.000	1.000	0.035	1.000	0.029
F	0.015	0.025	0.116	0.032	0.001	0.012	0.033	0.185	0.003	0.770	0.165
G	0.216	0.000	0.485	0.136	0.331	0.106	0.068	0.521	0.267	0.262	1.000
H	0.004	0.001	0.068	0.040	0.155	0.108	0.000	0.174	0.032	0.094	0.724
I	0.052	0.000	0.046	0.011	0.238	0.000	0.077	0.047	0.005	0.031	0.000
J	0.000	0.001	0.002	0.000	0.097	0.031	0.001	0.016	0.000	0.030	0.041

Table 8. The preferences*

Firms	OCFR	CR	CROA	CROFA	CTO	CNP	CTS	CTEE	CTLTD	CTE	CPS
A	0.010	0.018	0.005	0.009	0.006	0.008	0.012	0.004	0.012	0.005	0.010
B	0.010	0.018	0.005	0.009	0.006	0.008	0.012	0.004	0.012	0.005	0.010
C	0.010	0.018	0.005	0.009	0.006	0.008	0.012	0.004	0.012	0.005	0.010
D	0.010	0.018	0.005	0.009	0.006	0.008	0.012	0.004	0.012	0.005	0.010
E	0.010	0.018	0.005	0.009	0.006	0.008	0.012	0.004	0.012	0.005	0.010
F	0.010	0.018	0.005	0.009	0.006	0.008	0.012	0.004	0.012	0.005	0.010
G	0.010	0.018	0.005	0.009	0.006	0.008	0.012	0.004	0.012	0.005	0.010
H	0.010	0.018	0.005	0.009	0.006	0.008	0.012	0.004	0.012	0.005	0.010
I	0.010	0.018	0.005	0.009	0.006	0.008	0.012	0.004	0.012	0.005	0.010
J	0.010	0.018	0.005	0.009	0.006	0.008	0.012	0.004	0.012	0.005	0.010

Table 9. Real evaluation matrix*

Firms	OCFR	CR	CROA	CROFA	CTO	CNP	CTS	CTEE	CTLTD	CTE	CPS
A	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.000
B	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000
C	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.001	0.000	0.000	0.000
D	0.002	0.004	0.002	0.002	0.000	0.001	0.000	0.002	0.012	0.001	0.000
E	0.010	0.018	0.005	0.009	0.000	0.002	0.012	0.004	0.000	0.005	0.000
F	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.004	0.002
G	0.002	0.000	0.002	0.001	0.002	0.001	0.001	0.002	0.003	0.001	0.010
H	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.000	0.001	0.007
I	0.001	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000
J	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000

***Source:** Authors

Table 10. The total gap matrix*

Firms	OCFR	CR	CROA	CROFA	CTO	CNP	CTS	CTEE	CTLTD	CTE	CPS
A	0.009	0.018	0.005	0.009	0.006	0.000	0.012	0.004	0.012	0.005	0.010
B	0.010	0.018	0.005	0.009	0.000	0.008	0.012	0.004	0.012	0.005	0.010
C	0.010	0.018	0.005	0.009	0.004	0.008	0.012	0.003	0.012	0.005	0.010
D	0.008	0.014	0.003	0.007	0.006	0.007	0.012	0.002	0.000	0.004	0.010
E	0.000	0.000	0.000	0.000	0.006	0.006	0.000	0.000	0.012	0.000	0.010
F	0.010	0.017	0.004	0.009	0.006	0.008	0.012	0.003	0.012	0.001	0.008
G	0.008	0.018	0.003	0.008	0.004	0.007	0.011	0.002	0.009	0.004	0.000
H	0.010	0.018	0.005	0.009	0.005	0.007	0.012	0.003	0.012	0.005	0.003
I	0.009	0.018	0.005	0.009	0.005	0.008	0.011	0.004	0.012	0.005	0.010
J	0.010	0.018	0.005	0.009	0.006	0.008	0.012	0.004	0.012	0.005	0.010

***Source**: Authors

In Table 11 (also in figure 1) it can be seen the results of Entropy-MAIRCA integrated method. According to the method, company performance is better if Qi is low. Considering the results of MAIRCA in Table 5, we can say that company E shows better performance in liquidity, efficiency, and profitability than others. As a result of this finding, as shown in Table 11 company E has the better overall performance with 0.0333 Qi degree when compared to others.

Table 11. Ranking of firms

	Q_i	Rank
A	0.0894	5
B	0.0930	7
C	0.0956	8
D	0.0739	3
E	*0.0333*	*1*
F	0.0914	6
G	0.0737	2
H	0.0886	4
I	0.0963	9
J	0.0985	10

Source: Authors

Results of the study shows that the worst performed companies have very close Qi degree as seen in Table 11. The company J has the worst degree with 0.0985 and ranked as 10th, the company I is the 9th with 0.0963 and with 0.0914 the company F is ranked as 6th.

5. Discussion and Conclusion

Tourism is one of the important sectors for Turkey's economic growth (Kaplan and Aktas, 2015: 41). As Furmolly and Kırkulak-Uludağ (2018: 19) showed that Turkey is one of the tourism-led growth economies, it can be said that financial decisions are important in the survival of tourism companies which have the important role for the country's tourism. Financial statements are an important information provider about a company's operating and financial decision results. As a result of the decisions, it will not be wrong to say one of the most important items that can be extracted from financial statements is the actual cash flow of the firm. There is an official accounting statement called the statement of cash flows, which purpose the showing the firm cash flow (Ross et al., 2008: 29).

The cash flow statement is one of the important table as part of a set of financial statements for all companies. This statement of cash flows classify cash receipts and payments according to whether they originate from operating, investing, or financing activities. To understand a company's financial position, company stakeholders should calculate ratios from the statement of cash flows in which sources and uses of cash (Mills and Yamamura, 1998: 60-61). Using traditional ratios to evaluate a company's financial performance is not the only way, but it is also necessary to use cash flow-based ratios to understand better and accurate picture of a company.

Within this context, it was aimed to evaluate financial performance of tourism companies based on cash flow ratios in the study. Eleven cash flow ratios were used to measure the performance of ten companies whose shares traded on BIST. According to the study results, it has been seen that examined companies as of 2018 have some problems to generate operating cash flows. Mostly, companies are illiquid, insufficient and unprofitable according to cash flow based ratios. Fawzi et al. (2015) revealed that CTS and CTLTD have significant relationship with financial distress additional to other three cash flow based ratios. The other important conclusion of the Fawzi et al. (2015)'s study is that the cash flow based solvency and profitability ratios signal about financial distress.

The study has some important limitations and the findings should be handled under these constraints. First of all, the study was realized by using a year observations to evaluate cash flow based performance. In this respect, the study can be seen as a case study and the results cannot be generalized. Second, in the study just a few ratios were used instead of using a wide set of ratio, and only operating cash flows was analyzed excluding cash flows from investing and financing activities. Last but not least, just limited number of tourism companies in a country level have been evaluated. On the other hand, it makes the study important to be one of the limited cash flow based studies in the tourism sector. One another importance of the study is to be one of the pioneering study using multi-criteria decision-making process in the context of cash flow based ratio analysis.

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