ANALYZING FINANCIAL PERFORMANCE OF TURKISH DEPOSIT BANKS USING TOPSIS METHOD

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Abstract

Banking industry is indisputably the biggest part of the financial sector in Turkey. Regarding the importance of banking industry, this study aimed to investigate the financial performance of Turkish banking industry for the period between 2012 and 2019 using TOPSIS method. For this purpose, firstly ten banks, which had the highest amount of assets, were ranked using eight criteria since these banks represent a great percentage of the banking industry. Secondly, bank ownership types were analyzed and ranked. The results indicate that there is a decline in the performance of state owned banks. Foreign banks founded in Turkey seemed to be the best performing bank type in the last three years. Moreover, in this set of ten banks, the best bank from 2012 to 2017 was a state owned bank, the best bank in 2018 was a foreign bank founded in Turkey and the best bank in 2019 was a privately owned bank.

Keywords: *Banks, TOPSIS, Financial Performance.*

Jel Codes: G20, G21, G29

TÜRK MEVDUAT BANKALARININ FİNANSAL PERFORMANSLARININ TOPSIS METODUYLA ANALİZİ

Öz

Bankacılık endüstrisi tartışmasız Türkiye'deki finansal sektörün en büyük parçasıdır. Bankacılık sektörünün önemini dikkate alan bu çalışma, TOPSIS yöntemini kullanarak Türk bankacılık sektörünün finansal performansını 2012-2019 periyodu için araştırmayı amaçlamaktadır. Bu hedef doğrultusunda, ilk olarak bankacılık sektörünün büyük bir kısmını temsil ettiğinden en yüksek aktif büyüklüğe sahip on banka sekiz kriter kullanarak sıralanmıştır. İkinci olarak banka sahiplik tipleri analiz edilmiş ve gerekli sıralama yapılmıştır. Sonuçlara göre, kamu bankalarında bir düşüş gözlenmektedir. Türkiye'de kurulmuş yabancı bankalar son üç yıl içinde en iyi performans gösteren banka tipi olmuştur. Ayrıca bu 10 bankadan oluşan firma seti içinde, 2012'den 2017'ye kadar en iyi performans gösteren banka bir kamu sermayeli mevduat bankası olmuş, 2018 yılında Türkiye'de kurulmuş bir yabancı sermayeli banka ve 2019 yılında ise özel sermayeli bir mevduat bankası en iyi performansı göstermiştir.

Anahtar Kelimeler: *Bankalar, TOPSIS, Finansal Performans.*

Jel Kodları: G20, G21, G29

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1.INTRODUCTION

Banks are important organizations both for the ones who need to evaluate their excess funds and for the ones who require funds. Among the other intermediaries such as leasing companies, factoring companies and insurance companies, banks are of capital importance since their volume of transactions is much higher than other intermediaries' volume of transactions.

A growing and profitable banking industry may be interpreted as an indication of a growing economy. Because in a growing country, firms need bank loans to expand their businesses. In a growing economy, both profitability and the number of contracts may increase in the banking industry. Banks not only contribute to the economy of a country by providing loans to firms and individuals, but also they decrease the unemployment rate by employing a great number of staff. They also facilitate import and export transactions via various ways.

Bank performances have been investigated by many academicians, managers, government and investors. The most common approach is to calculate ratios such as return on assets, return on equity and net interest margin. Ratio analysis gives ranking of firms from a perspective, however, the combined effect of ratios could be better perceived via a multi criteria decision making (MCDM) method.

TOPSIS (Technique for Order Preference by Similarity to Ideal Solution), proposed by Hwang and Yoon (1981), is one of the most widely used MCDM methods in firm ranking. TOPSIS method was preferred in this study since it is easy to implement. TOPSIS was used in the baking industry by Demireli (2010), Oral (2016), Yamaltdinova (2017), Vergili (2018). While Demireli (2010) measured the performance of state-owned banks, Oral (2016) was investigated the performance of privately owned deposit banks. Yamaltdinova (2017) made a research on Kyrgyzstan banks, Kendirli, Kendirli and Aydın (2019) searched the performance of participation and commercial banks by considering the global financial crisis.

This study aims to investigate the financial performance of Turkish banks regarding different ownership types in the banking industry. These ownership types are state owned, privately owned, foreign banks founded in Turkey. In addition to ownership types, ten banks, which had the highest amount of assets, were ranked for the period from 2012 to 2019. Those banks were also investigated in terms of ownership types.

The rest of the study is structured as follows. Section 2 gives a brief literature review. Section 3 provides information about banking industry in Turkey. While section 4 explains the data and the methodology used in this study, section 5 gives the empirical findings. The conclusion part is in section 6.

2.LITERATURE REVIEW

There are a great number of studies on bank financial performances using MCDM methods. Based on the given criteria, these studies provide individual ranking for banks. Some of them are presented below:

Demireli (2010) analyzed the financial performance of Turkish state-owned commercial banks using TOPSIS method for the years from 2001 to 2007. Total equity/ total assets, total loans/ total assets, non-performing loans/ total loans, long-term assets/total assets, liquid assets/ total assets, liquid assets/ short term liabilities, return on assets, return on equity, net interest income/ total assets, net interest income/ total operating income were the ratios used in the analysis. The author used equal weights for the criteria and stated that state-owned banks were affected by both domestic and global financial crisis.

Oral (2016) investigated the financial performance of Turkish privately-owned deposit banks using TOPSIS method. The study covered the period between 2012 and 2014. Oral (2016) evaluated the financial performances using equally weighted ten criteria. The criteria included in the analysis were related to profitability, liquidity, capital adequacy, asset quality and revenue-expenditure structure.

Yamaltdinova (2017) evaluated the financial performance of Kyrgyzstan banks with TOPSIS method. The study covered the period between 2010 and 2014. The author ranked 15 banks using 27 criteria. Some of the criteria were total equity/ total assets, total loans/total assets, liquid assets/ total assets, return on assets, return on equity, interest income/total income.

A study on the performance of publicly traded private and state banks operating in Turkey was handled by Özkan (2017). The study covered the period between 2007 and 2015. Some of the criteria of the study were equity/ total assets, current assets/total assets, long-term assets/total assets, return on assets and return on equity.

Vergili (2018) evaluated the financial performance of banks traded in Borsa Istanbul (BIST) using TOPSIS method for the period between 2009 and 2013. Equity/ total assets, total loans and receivables/ total assets, return on assets, return on equity, liquid assets/ total assets are some of the ratios used in the analysis. The author stated that foreign deposit banks founded in Turkey showed better performance than privately-owned deposit banks and state-owned deposit banks.

Roy and Das (2018) investigated the financial performance of selected banks in Bangladesh. The study covered the period between 2000 and 2013. Twelve profitability and efficiency ratios, six size and growth indicators/ ratios, four strength and soundness ratios, three asset quality ratios were used in the analysis. The weights of the ratios were calculated using Shannon entropy method and the banks were ranked based on the TOPSIS method. The authors assert that foreign commercial banks and private commercial banks show better performance than state-owned banks.

Using TOPSIS method, Özkan (2019) evaluated the financial performance of deposit banks traded in Borsa Istanbul (BIST). The study period covered the years between 2013 and 2017. Equity/ total assets, average return on assets, average return on equity, loans under follow up/ total loans and receivables, total loans and receivables/ total assets, long-term assets/ total assets, liquid assets/ total assets are some of the criteria used in the study.

Kendirli, Kendirli and Aydın (2019) investigated the financial performance of participation and commercial banks within the framework of global financial crisis. According to the authors, while commercial banks showed better performances before and after the global financial crisis, participation banks were better during the crisis year.

While some studies give an idea about the ranking of companies, some of them focus on the sector performances. These studies may be about the performance of a sector during a period or it may be about the comparison of a few sectors.

Akyüz and Kaya (2013) investigated the financial performance of life/retirement insurance and non-life insurance sector in Turkey using TOPSIS method. The study covered the period between 2007 and 2011. Ten criteria were utilized in the analysis. While the best performance of the non-life insurance sector was in 2007, the worst performance was in 2008.

Gürol (2018) made a research on the performance of factoring, leasing and financing sectors in Turkey from 2014 to 2016. The ratios that Gürol (2018) used are net income/ transaction volume, receivables / total assets, non-performing loans, return on equity, return on assets, net income / number of companies, net income/ number of customers and net income / number of personnel. According to the study results, 2016 was the best year for both factoring and leasing sectors.

Gürol and İmam (2018) made a study on the performance of private pension sector using TOPSIS method for the period between 2006 and 2016. Shareholder's equity/ total assets, short term liabilities/ total assets, net period profit / total assets, net period profit/ shareholder's equity, net period profit/ number of sector employees are some of the criteria used in the analysis. The authors stated that 2006 was the worst and 2008 was the best year in the study period.

Not only the performance of financial intermediaries and finance sector, but also other sectors were studied using the TOPSIS method. For example, Wang and Hsu (2004) implemented TOPSIS to evaluate the operation performance of ten listing companies in Taiwan stock market. The authors used inventory turnover, net income ratio, earning per share and current ratio in the analysis.

Bilici (2019) investigated the performance of Tourism sector with TOPSIS and ratio analysis.

Guo (2020) made a research on financial ability of port listed companies using entropy weight TOPSIS. The author states that the overall level of port-listed companies' ability to pay debts is good, and overall level of operation ability of this set of firms is poor.

Singh, Kumar and Sagar (2020) made an analysis to select the best software methodology. The authors evaluated six alternatives using six criteria. The model the authors used was a hybrid model consisted of entropy and Topsis. Finally, the alternatives were ranked in the study.

3.BANKING INDUSTRY IN TURKEY

The banking sector in Turkey can be analyzed through a number of ratios related to profitability and liquidity, and a few sector indicators. The importance of banking industry was explained in the introduction part. According to annual report 2019 released by Banking Regulation and Supervision Agency (BRSA), banks' share in the financial system is 86.5%. Figure 1 gives an idea about the banking industry in the financial sector. Factoring, leasing and asset management companies have small percentages in the financial system when compared with banks.

Liquidity is an important indicator in the banking industry. It shows the firm's ability to make payment for short term debt and operating expenses. The figure 2 depicts two important ratios, the liquid assets/ total assets and liquid assets/ short term liabilities for the banking system in Turkey. The ratio of liquid assets in the total assets is decreasing. Also, the ability to pay short term liabilities with liquid assets is decreasing. Banks in Turkey should review their liquidity positions by considering the bank specific, country specific and global risks in the financial sectors.
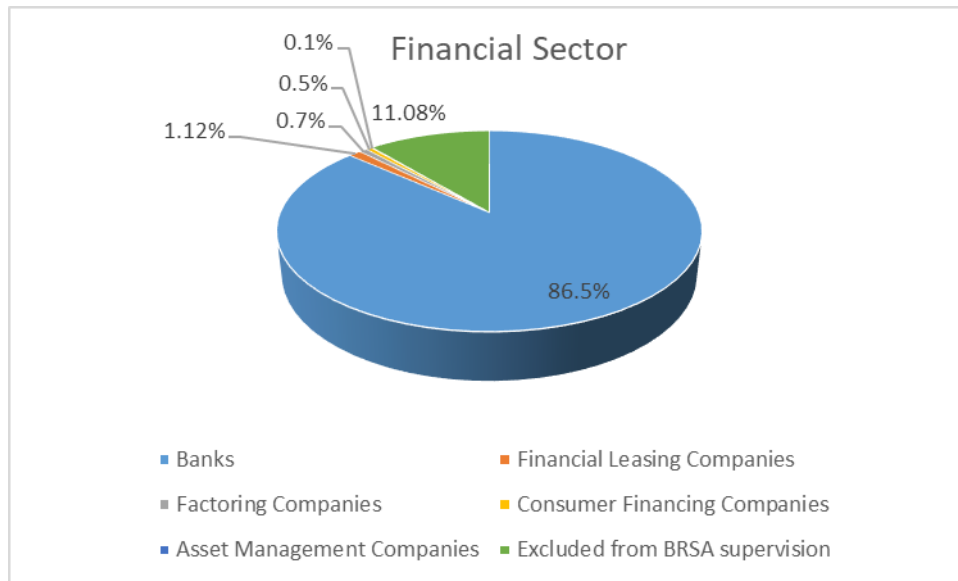

Figure 1: Financial Sector under BRSA Supervision

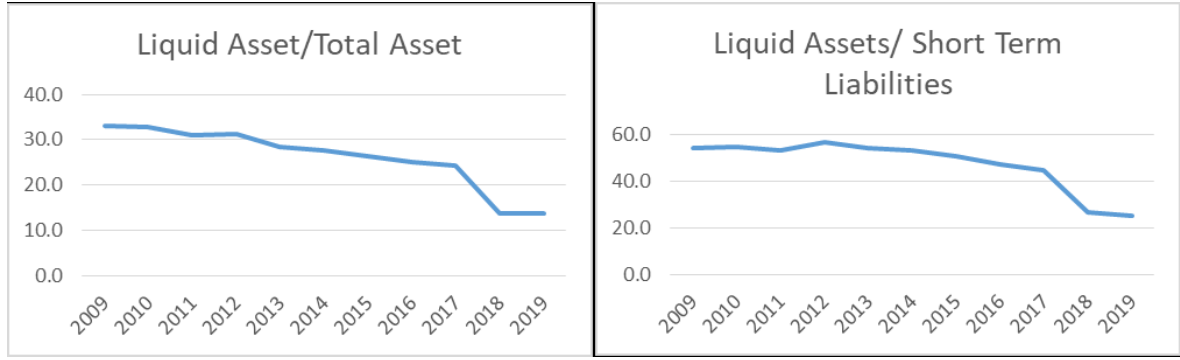*Source:* BRSA, 2019 Annual Report, p.21

Figure 2: Liquidity Indicators for Banking System in Turkey[1]

Source: https://www.tbb.org.tr/en/banks-and-banking-sector-information/statistics-and-data-query/
statistical-reports/20

Another important indicator for banking industry is profitability. In the banking industry, profitability is usually evaluated with return on assets, return on equity and net interest margin. Figure 3 provides an overview of how profitability changed in the Turkish banking industry over the last decade. Both average return on assets and average return on shareholder's equity are in a declining trend, though there is a rise in profitability between 2015 and 2017.
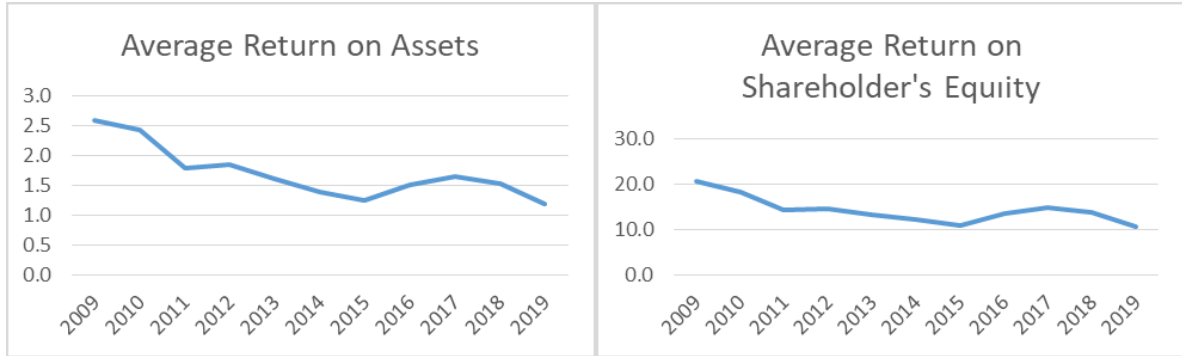
Figure 3: Profitability Indicators for Banking System in Turkey[2]

Source: https://www.tbb.org.tr/en/banks-and-banking-sector-information/statistics-and-data-query/
statistical-reports/20

Both liquidity and profitability indicators have been in a declining trend over the last decade. Number of staff and number of branches also give an idea about the performance of banking industry. If a bank has enough profit and capital, it may follow a business growth strategy, both domestically and globally, and increase the number of branches and employees.

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1 The figure 2 was produced from the data taken from The Banks Association of Turkey.
2 The figure 3 was produced from the data taken from The Banks Association of Turkey.
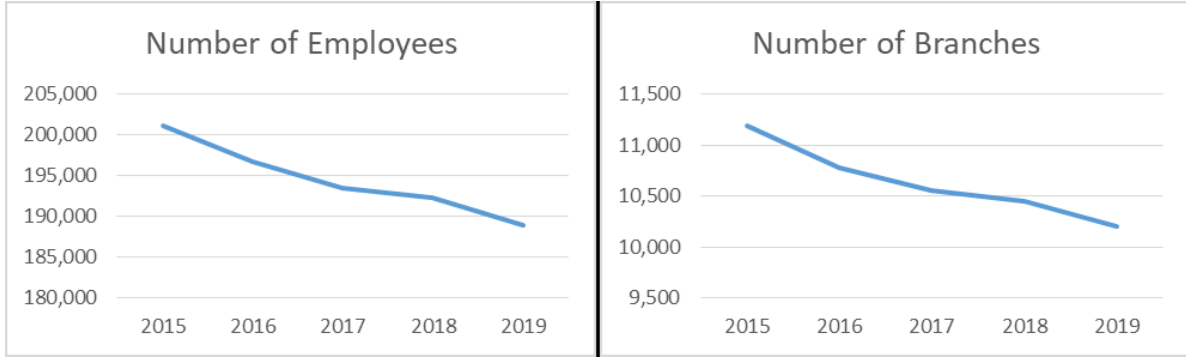
Figure 4: Number of Branches and Employees for Banking System in Turkey[3]

Source: https://www.tbb.org.tr/Content/Upload/istatistikiraporlar/ekler/952/Banks_Employees_and_
Branches-December_2019.pdf

The numbers in Figure 4 show that both number of employees and number of branches are declining in the Turkish banking industry. With the increase in the number of internet users in the banking industry, most banking transactions have been done via internet banking. This decline may be partially attributed to online banking activities, because the need for some branches and staff has decreased. If this decline was completely resulted from internet usage of bank customers, then the profitability of the banking system would increase. Because less branches and employees mean less operating expenses and more profit. So rather than internet usage, there are some other factors which affect the number of branches and employees.

All the trends necessitate the investigation of banking industry in Turkey since that industry is connected to all industries and constitutes a very big part of the financial system in Turkey.

4. DATA AND METHODOLOGY

4.1. Data

The data used in this study was taken from the website of the Banks Association of Turkey. Under the statistical reports section, financial statements and some selected ratios of banks are available (https://www. tbb.org.tr/en/banks-and-banking-sector-information/statistics-and-data-query/statistical-reports/20). Although most of the studies which implement the TOPSIS method use five years of data, this analysis includes eight years of data. Analysis with a longer period will provide more reliable results. For example, this study results show that the state owned banks were the best banks between 2012 and 2016. Those five years indicate a super performance by that bank type, but if 2017, 2018 and 2019 are studied, it can be observed that foreign banks founded in Turkey are the best performing banks. Thus, the longer period indicates more reliable results.

Profitability is an important indicator for the financial performance of banks. Return on assets and return on equity are main profitability ratios which are broadly used by many authors. In this study, rather than using return on assets, average return on assets and average return on shareholder's equity were used. Return on assets and return on equity were used by Demireli (2010), Yamaltdinova (2017), Vergili (2018) and many other authors.

The decreasing trend in liquidity in the financial sector in the last decade makes liquidity as important as profitability. Liquid assets/ total assets and liquid assets/ short-term liabilities are frequently used ratios in the measurement of financial performance of banks. These ratios were considered by Demireli (2010), Kendirli, Kendirli and Aydın (2019), Oral (2016), Özkan (2019) and Vergili (2018).

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3 The figure 4 was produced from the data taken from The Banks Association of Turkey (Quarterly Statistics by Banks, Employees and Branches in Banking System, December 2019).

Shareholder's equity/total assets shows what percentage of bank's assets are owned by shareholders. Shareholder's equity/ total assets ratio was preferred by Demireli (2010), Kendirli, Kendirli and Aydın (2019), Oral (2016), Özkan (2019) and Vergili (2018).

Since banking activities are mainly based on interest, the analysts expect interest income to be as much as possible. Net interest income after specific provisions / total assets was used by Kendirli, Kendirli and Aydın (2019), Özkan (2019). Net interest income/ total assets was utilized by Demireli (2010), Oral (2016). All ratios in the analysis were equally weighted. Table 1 gives the full list of the variables used in this study.

Table 1: Ratios used in the Analysis

	Ratio Group	Ratio	Weight
R1	Profitability	Average Return on Assets	12.50%
R2	Profitability	Average Return on Shareholder's Equity	12.50%
R3	Liquidity	Liquid Assets/ Total Assets	12.50%
R4	Liquidity	Liquid Assets/ Short Term Liabilities	12.50%
R5	Capital Ratios	Shareholder's Equity/ Total Assets	12.50%
R6	Interest- Expense Structure	Net Interest Income After Specific Provisions / Total Assets	12.50%
R7	Interest- Expense Structure	Net Interest Income After Specific Provisions / Total Operating Income	12.50%
R8	Interest- Expense Structure	Interest Income / Total Assets	12.50%

4.2.Methodology

Firstly, ten biggest banks in terms of assets were determined using the data of 2020. Among these banks, the Eximbank was omitted since its main activity and purpose are not similar to the deposit banks. So the eleventh bank with highest amount of assets was added into the analysis. The selected ten banks are the biggest banks and have a great percentage in the Turkish banking industry.

Secondly, the ownership types of deposit banks given in the data of Banks Association of Turkey were investigated. Foreign banks having branches in Turkey were not considered since the size of transactions of that ownership type is relatively low. Consequently, three ownership types were included in the second analysis, which are state-owned, privately owned and foreign banks founded in Turkey.

In this study, TOPSIS (The Technique for Order Preference by Similarity to Ideal Solution) method was used. It is a popular method for financial performance evaluation and ranking firms considering multi-criteria. TOPSIS method was first proposed by Hwang and Yoon (1981).

The steps of the method can be stated as follows (Wang, 2017:4068-4069):

1) First of all, the analyst should determine the decision matrix.

$$X = (x_{ij})_{n*m} \tag{1}$$

Normalization of that matrix is needed in the second step.

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{k=1}^{n} x^2_{kj}}} \tag{2}$$

Where rij is the normalized value, i= 1,2,3….n and j=1,2,3,...m.

2) After the normalization process, the weighted normalized decision matrix should be calculated.

$$v_{ij} = w_j r_{ij} \tag{3}$$

Where w_j represents the weight of the jth criterion.

3) In the next step, the positive and negative ideal solutions should be determined.

$$A^* = \{v_1^*, v_2^*, \dots, v_m^*\} \tag{4}$$

$$= \{\max v_{ij} | j \in Q_b\}, \{\min v_{ij} | j \in Q_c\},$$

$$A^- = \{v_1^-, v_2^-, \dots, v_m^-\} \tag{5}$$

$$= \{\min v_{ij} | j \in Q_b\}, \{\max v_{ij} | j \in Q_c\},$$

Where Q_b and Q_c represent the categories of benefit and cost criteria respectively.

4) The Euclidean distance of alternatives from both the positive and negative ideal solution should be calculated as a fifth step.

$$D_i^* = \sqrt{\sum_{j=1}^{m} (v_{ij} - v_j^*)^2}, i = 1,2,3, \dots n \tag{6}$$

$$D_i^- = \sqrt{\sum_{j=1}^{m} (v_{ij} - v_j^-)^2}, i = 1,2,3, \dots n \tag{7}$$

The sixth step is the calculation of the relative closeness for all alternatives to the ideal solution.

$$RC_i = \frac{D_i^-}{D_i^- + D_i^*}, i = 1,2,3, \dots n \tag{8}$$

After the steps given above, the alternatives can be ranked based on the relative closeness to ideal solution.

5.EMPIRICAL FINDINGS

The decision matrix, normalized matrix and the weighted normalized matrix of the selected ten banks are given in table 2, table 3, and table 4 respectively.

Table 2: Decision Matrix for 2019 – the Selected Ten Banks

Bank	R1	R2	R3	R4	R5	R6	R7	R8
B1	1.043	9.708	8.832	14.737	10.783	2.907	79.495	10.096
B2	0.412	5.620	8.367	13.541	7.045	1.294	45.660	10.224
B3	1.372	11.175	14.141	24.275	12.578	2.464	51.983	9.196
B4	0.747	9.131	10.099	18.551	7.874	1.133	25.681	10.032
B5	1.641	12.262	16.342	27.300	13.745	1.919	27.643	10.146
B6	0.979	8.979	19.250	35.221	10.629	1.539	30.397	9.214
B7	1.575	11.034	12.896	24.061	15.085	2.208	38.898	9.572
B8	1.547	16.778	12.468	22.227	9.184	3.131	63.588	10.102
B9	0.909	8.057	13.629	22.546	11.324	0.540	8.484	10.780
B10	1.048	11.001	19.887	28.138	9.055	3.732	65.889	11.571

Table 3: Normalized Matrix for 2019– the Selected Ten Banks

Bank	R1	R2	R3	R4	R5	R6	R7	R8
B1	0.277	0.286	0.198	0.195	0.310	0.401	0.519	0.316
B2	0.110	0.165	0.188	0.179	0.203	0.179	0.298	0.320
B3	0.365	0.329	0.317	0.322	0.362	0.340	0.340	0.287
B4	0.199	0.269	0.226	0.246	0.226	0.156	0.168	0.314
B5	0.436	0.361	0.366	0.362	0.395	0.265	0.181	0.317
B6	0.260	0.264	0.431	0.467	0.306	0.213	0.199	0.288
B7	0.419	0.325	0.289	0.319	0.434	0.305	0.254	0.299
B8	0.411	0.494	0.279	0.295	0.264	0.432	0.415	0.316
B9	0.242	0.237	0.305	0.299	0.326	0.075	0.055	0.337
B10	0.279	0.324	0.446	0.373	0.260	0.515	0.431	0.362

Table 4: The Weighed Normalized Matrix and Positive - Negative Ideal Solutions for 2019 – the Selected Ten Banks

Bank	R1	R2	R3	R4	R5	R6	R7	R8
B1	0.035	0.036	0.025	0.024	0.039	0.050	0.065	0.039
B2	0.014	0.021	0.023	0.022	0.025	0.022	0.037	0.040
B3	0.046	0.041	0.040	0.040	0.045	0.043	0.042	0.036
B4	0.025	0.034	0.028	0.031	0.028	0.020	0.021	0.039
B5	0.055	0.045	0.046	0.045	0.049	0.033	0.023	0.040
B6	0.033	0.033	0.054	0.058	0.038	0.027	0.025	0.036
B7	0.052	0.041	0.036	0.040	0.054	0.038	0.032	0.037
B8	0.051	0.062	0.035	0.037	0.033	0.054	0.052	0.039
B9	0.030	0.030	0.038	0.037	0.041	0.009	0.007	0.042
B10	0.035	0.040	0.056	0.047	0.033	0.064	0.054	0.045
A*	0.055	0.062	0.056	0.058	0.054	0.064	0.065	0.045
A-	0.014	0.021	0.023	0.022	0.025	0.009	0.007	0.036

Table 5: Ranking of the Selected Ten Banks - 2019

Bank	Bank Classification	Score	Rank
B1	State owned 1	0.56	4
B2	State owned 2	0.26	8
B3	Privately owned 1	0.59	3
B4	State owned 3	0.23	10
B5	Foreign Bank Founded in Turkey 1	0.54	6
B6	Privately owned 2	0.46	7
B7	Privately owned 3	0.55	5
B8	Foreign Bank Founded in Turkey 2	0.68	2
B9	Foreign Bank Founded in Turkey 3	0.26	9
B10	Privately owned 4	0.69	1

Table 5 presents the ranking of ten biggest deposit banks for 2019. In table 5, there are three state-owned, four privately owned and three foreign banks founded in Turkey. The best bank in 2019 was a privately owned deposit bank and it is followed by a foreign bank founded in Turkey. The performance of state banks was relatively low.

Table 6 gives the rankings of the ten selected banks from 2012 to 2019. There is a decline in the performance of state owned banks. From 2012 to 2017, the best performing bank was a state-owned bank. In the last two years, there are no state-owned banks among the three best performing banks. There is a rise in the performance of the privately owned bank 4. It was in the ninth place in 2012, but at the first place in 2019.

Table 6: Ranking of the Selected Ten Banks – 2012-2019[4]

		2019		2018		2017		2016		2015		2014		2013		2012	
	Bank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
State Owned 1	B1	0.56	4	0.53	6	0.67	1	0.69	1	0.78	1	0.86	1	0.69	1	0.52	4
State Owned 2	B2	0.26	8	0.16	10	0.23	9	0.20	9	0.37	6	0.42	5	0.60	2	0.58	1
Privately owned 1	B3	0.59	3	0.54	5	0.47	5	0.47	5	0.40	5	0.55	3	0.41	6	0.36	7
State Owned 3	B4	0.23	10	0.35	9	0.27	8	0.27	8	0.32	8	0.33	10	0.33	8	0.25	10
Foreign bank founded in Turkey 1	B5	0.54	6	0.62	3	0.65	2	0.48	3	0.47	3	0.55	4	0.48	5	0.52	3
Privately owned 2	B6	0.46	7	0.49	7	0.22	10	0.14	10	0.19	10	0.33	9	0.60	3	0.29	8
Privately owned 3	B7	0.55	5	0.57	4	0.65	3	0.59	2	0.50	2	0.64	2	0.53	4	0.53	2
Foreign bank founded in Turkey 2	B8	0.68	2	0.66	1	0.47	4	0.39	6	0.31	9	0.35	8	0.35	7	0.41	6
Foreign bank founded in Turkey 3	B9	0.26	9	0.43	8	0.42	7	0.48	4	0.35	7	0.39	6	0.21	10	0.52	5
Privately owned 4	B10	0.69	1	0.64	2	0.43	6	0.36	7	0.45	4	0.36	7	0.27	9	0.29	9
The best bank		Privately		Foreign		State		State		State		State		State		State	
The second best bank		Foreign		Privately		Foreign		Privately		Privately		Privately		State		Privately	
The third best bank		Privately		Foreign		Privately		Foreign		Foreign		Privately		Privately		Privately	

Of course, there may be other banks which perform better than those ten banks. To see the performance of the whole sector, an analysis including the data of all banks of the ownership types were performed. Table 7, table 8 and table 9 gives the decision, normalized and the weighted normalized matrices respectively.

Table 7: Decision Matrix for 2019 - Bank Ownership Types

	R1	R2	R3	R4	R5	R6	R7	R8
State-owned Banks	0.772	8.566	9.041	15.329	8.864	1.936	53.528	10.117
Privately-owned	1.212	10.066	15.708	27.492	12.247	2.134	40.865	9.658
Foreign Banks Founded in Turkey	1.481	12.501	18.362	31.232	12.118	2.135	34.305	10.228

Table 8: Normalized Matrix for 2019 – Bank Ownership Types

	R1	R2	R3	R4	R5	R6	R7	R8
State-owned Banks	0.374	0.471	0.350	0.346	0.457	0.540	0.708	0.584
Privately-owned	0.587	0.553	0.609	0.620	0.632	0.595	0.541	0.557
Foreign Banks Founded in Turkey	0.718	0.687	0.712	0.704	0.625	0.595	0.454	0.590

Table 9: The Weighed Normalized Matrix and Positive - Negative Ideal Solutions for 2019 – Bank Ownership Types

	R1	R2	R3	R4	R5	R6	R7	R8
State-owned Banks	0.047	0.059	0.044	0.043	0.057	0.067	0.089	0.073
Privately-owned	0.073	0.069	0.076	0.077	0.079	0.074	0.068	0.070
Foreign Banks Founded in Turkey	0.090	0.086	0.089	0.088	0.078	0.074	0.057	0.074
A*	0.090	0.086	0.089	0.088	0.079	0.074	0.089	0.074
A-	0.047	0.059	0.044	0.043	0.057	0.067	0.057	0.070

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4 Foreign bank founded in Turkey 1 was a privately owned bank in 2012, 2013 and 2014. Since 2015, its status has turned into foreign bank founded in Turkey.

Table 10: Ranking of Bank Ownership Types -2019

Bank Classification	Score	Rank
State-owned Banks	0.27	3
Privately-owned	0.63	2
Foreign Banks Founded in Turkey	0.73	1

According to table 6, the best bank was a privately owned bank in 2019 while the second best bank was a foreign bank founded in Turkey. Again, the third best one was a privately owned bank. The results seen in Table 10 indicate that the foreign banks founded in Turkey was the best bank type in 2019. This result may be interpreted as a success of a few privately owned banks. Some privately owned banks were distinctively more successful than the other privately owned banks, but foreign banks founded in Turkey was the best bank type when all banks were included in the analysis.

Table 11: Ranking of Bank Ownership Types 2012 -2019

		2019		2018		2017		2016		2015		2014		2013		2012	
Bank Classification	Bank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
State-ow ned Banks	B1	0.27	3	0.21	3	0.42	2	0.66	1	0.80	1	0.83	1	0.84	1	0.63	1
Privately-ow ned Banks	B2	0.63	2	0.56	2	0.38	3	0.42	2	0.20	3	0.66	2	0.72	2	0.44	3
Foreign Banks Founded in Turkey	B3	0.73	1	0.79	1	0.66	1	0.41	3	0.41	2	0.18	3	0.14	3	0.47	2

Table 11 presents the bank performances of ownership types. One of the outstanding issues in the table is state-owned banks showed relatively good performance in 2012, 2013, 2014, 2015 and 2016. In 2017, state-owned banks were the second best performing bank type. In 2018 and 2019, state-owned banks fell to the last place.

In the last three years, foreign banks founded in Turkey was the best performing bank type. When figure 2, figure 3 and figure 4 are studied, it can be said that there is a declining trend in the Turkish banking industry. During this trend, it seems that foreign banks founded in Turkey took better strategic decisions when compared with state-owned and privately owned banks.

6. CONCLUSION

In this study, the performance of Turkish deposit banks was investigated using the TOPSIS method and regarding the classification of Banks Association of Turkey.

First of all, the banking industry is in a declining trend as shown in figure 2, figure 3 and figure 4. The profitability and liquidity ratios are decreasing. In addition, the number of employees and the number of branches are also decreasing. Since the banking industry is the most important part of the financial system, as shown in the figure 1, a decrease in the performance of banks will probably affect many sectors in the near future. Government should investigate the reasons for this decline in the performance of the banking industry and take the appropriate actions using laws, bylaws and other regulations. Otherwise, all sectors will be affected by that poor performance.

Secondly, state-owned banks began to show poor performance in recent years, although that ownership type was the best between 2012 and 2016. Foreign banks founded in Turkey relatively showed a better performance in the last three years. In this declining trend of the banking industry, foreign banks' strategies gave better results. Both state-owned and privately-owned banks should analyze the actions of foreign banks founded in Turkey.

Thirdly, the ranking of the ten banks having the highest amount of assets changes from year to year. The best bank of a year may be the sixth bank of the next year. The important thing is to sustain the position. A state owned bank remained as the best bank between 2013 and 2017. In 2018 and in 2019 different banks

were the best banks. State-owned, privately owned or foreign, banks should determine their policies regarding sustainability and follow the best bank's implementations.

Other multi-criteria decision making methods may be implemented to see the performance trend of the banking industry. Another analysis may give healthier results if the author implements a hybrid method and uses more criteria to evaluate the sector performance.

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