Financial Performance Analysis of Banks Included In BIST Banking Index During the Pandemic Period

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Abstract

The aim of this study is to examine the financial performance of banks included in the Borsa Istanbul Banking Index during the pandemic period. The Covid 19 pandemic caused a shock wave that deeply affected both real and financial markets around the world. The epidemic, which initially appeared as a regional health crisis, turned into an economic crisis due to the restrictions on social life and the closure of borders. This economic crisis, which affected the world, also deeply affected the financial markets that provided resources to the economy, as the countries' economies had to reduce production. Banks, the most important institution of the financial markets, are the institutions most affected by the economic crisis caused by the epidemic. The Turkish banking system, which has a strong capital structure, is also under the influence of the economic crisis. In this study, which examines the financial performance of the Turkish banking system during the pandemic period, the additive ratio assessment (ARAS) method, which is one of the multi-criteria decision-making techniques, was used. The financial performance indicators used in the study consist of 12 financial ratios determined by considering the components of the CAMELS evaluation system as a result of the literature review. Eight banks that make up the scope of the study were determined as deposit banks in the Borsa Istanbul Banking Index (XBANK). As a result of the analysis made with the indicators obtained from the 9-month financial statements of the relevant banks for September 2021, the banks with the best performance in the pandemic period were determined as Şekerbank, Halkbank and İş Bankası, respectively.

Keywords: Financial Performance, Banking, CAMELS, Multi-Criteria Decision Making Techniques, ARAS (Additive Ratio Assessment)

1. Introduction

The global pandemic situation, which entered the world agenda at the beginning of 2020 and whose effects are still continuing, has deeply affected the life we live. The pandemic crisis, which has shaped societies in all aspects and created a new normal, has also caused significant changes in the global economy. Particularly from a financial and economic point of view, the increasing uncertainty, decreasing demand and mandatory restrictions on all areas of life since the second quarter of 2020 started a sudden and deep deterioration process in the economy. It has been observed that economic activities are supported with support packages as well as the implementation of financial and monetary measures all over the world in order to reduce the effects of the negative effects in the economy.

Troubles in economic activities have affected all sectors around the world as well as banks, which are the main institutions of the financial system. In this period, when uncertainties and risks in the global markets and thus in the global financial system were high, regulations were implemented to support the banking sector. The global pandemic crisis has shown that banks, beyond being financial institutions, are key institutions that provide support for the execution of economic activities affected by the crisis. In order to mitigate the effects of the sectoral problems arising as a result of the sudden contraction in global trade and falling production volumes, banks have carried out support activities such as credit support packages and postponing loan payments for customers who have difficulties in payments.

In recent years, the digitalization process that has emerged in financial services, especially with the increase in technological developments, has progressed faster than expected due to the pandemic. The adaptation of technological developments to business models, especially in the banking sector, accelerated in this process, thus increasing the efficiency of banks by responding to the needs of customers more quickly. Due to the restrictions experienced during the pandemic process, banks have improved their service capacities by turning to alternative distribution channels and digital banking applications. Banks, which fall into a financial services ecosystem where daily withdrawal limits are increased, contactless transaction limits are increased, mobile approvals are used and remote service is also possible, have also had the opportunity to increase their efficiency during the pandemic period by producing technological solutions that respond quickly to customer requests and needs.

The Turkish banking sector continues to carry out its activities on solid foundations by adapting to the conditions of the pandemic period. Although there is no significant change in the number of banks operating in Turkey, the number of banks, which was 51 in 2019, is 55 as of the third quarter of 2021. The changes in the number of branches and personnel envisaged with the developments in financial technologies have developed as expected when the conditions of the pandemic period are taken into account. In the third quarter of 2021, the sector banks, which carried out their activities in 11,155 local and foreign branches, provided employment opportunities to 201,665 people in the same period. At this point, the development of internet banking and policies to reduce operational costs also increase the expectation that there will be a decrease in the number of branches and employment over the years. As of the third quarter of 2021, the asset size of the Turkish banking sector was 33%. In the same period, it is observed that the loan growth, the increase in the deposit amount and the

increase in the securities portfolio supported the asset size. The weight of the asset size of the banks included in this study is 64.2% of the sector (Banking Regulation and Supervision Agency, 2021).

In this study, which was carried out to determine the financial performance rankings of banks operating in the Turkish banking system during the pandemic period, firstly the studies on this subject will be examined, then the analysis results will be obtained by giving information about the method used in the study.

2. Literature Review

Although there are many studies examining the financial performance of companies in various sectors during the pandemic period, it is seen that the number of studies on the banking sector is less. Within the scope of this study, studies that reveal the effects of the pandemic on banks will be included.

Andersen et al. (2020) analyzed the effects of the pandemic on consumers demanding financial services in banks in Denmark. According to the findings, they concluded that credit card expenditures decreased by 25% and the primary reason for this was limited goods and services.

Armagan et al. (2021) examined the financial performances of banks traded in BIST during the pandemic period. As a result of the analysis made using the SECA method through the financial ratios obtained from the financial statements of 2020, they concluded that the best performing bank was QNB Finansbank and the lowest performing bank was Şekerbank.

Arslantürk Çöllü (2021) examined the performances of participation banks and traditional banks in Turkey separately. As a result of the study, sufficient evidence could not be reached that the participation banks are more durable than traditional banks for the epidemic period in terms of the period and variables evaluated within the scope of the research. As a result, the findings obtained by using the data for the period of June 2020, which can be considered as the initial stage of the epidemic, indicate that the negative impact of the epidemic on participation banks and traditional banks in Turkey remained at a limited level as a result of comprehensive measures taken by the relevant institutions and organizations.

Ersoy et al. (2020), in their research, examined the data of banks in Turkey 10 weeks before and 10 weeks after the start date of the pandemic period restrictions in Turkey, 11 March 2020. According to the findings, they found that the deposits increased accordingly, as the loan and securities values increased.

Hartley and Rebucci (2020) examined the 10-year government bond yields of 21 central banks during the pandemic and found that government bond yields increased in all banks during the pandemic period.

Işık and Akdoğan (2021) analyzed the effects of the pandemic on the financial statements of public, private and foreign banks in the Turkish Banking Sector. As a result of the analysis, it has been shown that the return on assets of a significant part of the deposit banks decreased

compared to the pre-pandemic period, the loan/deposit ratios increased compared to the pre-pandemic period, but this increase was due to the state-owned deposit banks.

Korzeb and Niedziółka (2020) examined the effects of 13 commercial banks in Poland against the situations encountered during the pandemic process. According to the results obtained, it has been obtained that the larger banks are more resistant during the pandemic period.

Kose et al. (2021), using the data of the first and second quarters of 2020, examined the financial performances of six participation banks operating in Turkey through the financial ratios of the CAMELS components with MAUT analysis. As a result, it has been determined that the best performing bank in the first quarter of 2020 is Türkiye Finans Katılım Bankası and the best performing bank in the second quarter of 2020 is Vakıf Katılım Bankası.

Koc et al. (2021), using the weekly data for the period of 2020 March-2021 May, analyzed the effects of the number of pandemic cases on banking indicators with the Fourier Cointegration Test. Accordingly, it has been observed that there is a positive relationship between the number of cases, retail loan volume and total loan volume, and that the increase in the number of cases affects the asset quality negatively.

Ulusoy and Demirel (2021) analyzed the factors affecting the profitability of banks before and after the pandemic. The findings showed that the capital adequacy ratio, own funds and total assets were effective on the profitability in the pre-pandemic period in the Turkish banking system. While the capital adequacy ratio continued to have an impact on the profitability of the system during the pandemic period, it was observed that the balance sheet structure, asset quality and liquidity took the place of equity and total assets in terms of impact on profitability.

3. Methodology

When the studies on financial performance are examined, it is seen that the most frequently used method is multi-criteria decision making techniques. In this study, financial performance evaluation will be made by using the ARAS (Additive Ratio Assessment) method, which is one of the multi-criteria decision-making techniques.

The ARAS method is a method developed by Zavadskas and Turskis (2010). In the ARAS method, the utility function values of the alternatives are compared with the utility function values of the optimal alternative. For this reason, the ARAS method is seen as the most appropriate method for proportional rating among multi-criteria decision-making methods (Zavadskas & Turskis, 2010; Yıldırım, 2015; Ömürbek et al., 2017; Bakır & Atalık, 2018).

The ARAS method consists of five stages (Zavadskas & Turskis, 2010):

Step 1. Creating the decision matrix: In the first stage, the decision alternatives of the decision problem and the evaluation criteria to be taken into account when evaluating these alternatives are determined. Then, the decision matrix showing the scores of the decision alternatives according to the criteria is created (Equation 1).

$$X=\begin{bmatrix} x_{01} & \cdots & x_{0j} & \cdots & x_{0n} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ x_{i1} & \cdots & x_{ij} & \cdots & x_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ x_{m1} & \cdots & x_{mj} & \cdots & x_{mn} \end{bmatrix};\ i=\overline{0,m};\ j=\overline{1,n}, \quad (1)$$

where m – number of alternatives, n – number of criteria describing each alternative, x_{ij}– value represening the performance value of the i alternative in terms of the j criterion, x_{0j} – optimal value of j criterion.

If optimal value of j criterion is unknown, then (Equation 2)

$$\begin{aligned} x_{0j} &= \max_i x_{ij},\ if\ \max_i x_{ij}\ is\ preferable; \\ x_{0j} &= \min_i x_{ij}^*,\ if\ \min_i x_{ij}^*\ is\ preferable. \end{aligned} \quad (2)$$

Step 2. Creating the Normalized Decision Matrix: The values of the criteria in the decision problems can be in different scales or in different units. For this reason, the values of the criteria with different units should be standardized to take values in the range of [0,1] by normalization. While performing the normalization process, Equation (3) is used for benefit-oriented criteria and Equation (4) is used for cost-oriented criteria.

The criteria, whose preferable values are maxima, are normalized as follows:

$$\bar{x}_{ij}=\frac{x_{ij}}{\sum_{i=0}^{m} x_{ij}} \quad (3)$$

The criteria, whose preferable values are minima, are normalized by applying two-stage procedure:

$$\bar{x}_{ij}=\frac{1}{x_{ij}^*};\ \bar{x}_{ij}=\frac{x_{ij}}{\sum_{i=0}^{m} x_{ij}} \quad (4)$$

The normalized decision matrix consisting of the values obtained by applying Equation (3) and Equation (4) is shown in Equation (5).

$$X=\begin{bmatrix} \bar{x}_{01} & \cdots & \bar{x}_{0j} & \cdots & \bar{x}_{0n} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ \bar{x}_{i1} & \cdots & \bar{x}_{ij} & \cdots & \bar{x}_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ \bar{x}_{m1} & \cdots & \bar{x}_{mj} & \cdots & \bar{x}_{mn} \end{bmatrix};\ i=\overline{0,m};\ j=\overline{1,n}, \tag{5}$$

Step 3. Creating the Weighted Normalized Decision Matrix: After the normalized decision matrix is created, a weighted normalized decision matrix is created by taking into account the determined criteria weights. It is possible to evaluate the criteria with weights $0 < w_j < 1$. The sum of weights w_j would be limited as follows Equation (6):

$$\sum_{j=1}^{n} w_j = 1 \tag{6}$$

Normalized-weighted values of all the criteria are calculated as follows Equation (7):

$$\hat{x}_{ij} = \bar{x}_{ij} w_j\ ;\ i=\overline{0,\ m} \tag{7}$$

The normalized decision matrix weighted with the values calculated by Equation (7) is created as shown in Equation (8).

$$X=\begin{bmatrix} \hat{x}_{01} & \cdots & \hat{x}_{0j} & \cdots & \hat{x}_{0n} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ \hat{x}_{i1} & \cdots & \hat{x}_{ij} & \cdots & \hat{x}_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ \hat{x}_{m1} & \cdots & \hat{x}_{mj} & \cdots & \hat{x}_{mn} \end{bmatrix};\ i=\overline{0,m};\ j=\overline{1,n}, \tag{8}$$

Step 4 Calculation of the Optimality Function: The optimality function values are calculated for each decision alternative by using Equation (9) with the help of the weighted

normalized decision matrix. The larger the Si value of any decision alternative, the better. Considering the calculation process, Si is directly related to the x_{ij} and w_j values that affect the final result. Therefore, the decision alternative with the highest optimality function value is a more efficient alternative.

$$S_i = \sum_{j=1}^{n} \hat{x}_{ij} \; ; \; i = \overline{0, m} \tag{9}$$

Step 5. Calculation of Benefit Degree and Final Ranking: In the last step of the method, the final ranking will be obtained by calculating the utility grade. The degree of utility is calculated by dividing the optimality function value of a decision alternative with the optimality function value of the best alternative. The degree of utility is calculated with the help of Equation (10).

$$K_i = \frac{S_i}{S_0} \quad i = \overline{0, m} \tag{10}$$

4. Results

In this study, which examines the financial performance of banks operating in the BIST Banking Index, deposit banks in the relevant index are determined as decision alternatives. The list and codes of the banks included in the study are shown in Table 1.

Table 1. Banks and Codes (Decision Alternatives)

Banks	**Codes**
AKBANK T.A.Ş.	AKBNK
TÜRKİYE GARANTİ BANKASI A.Ş.	GARAN
TÜRKİYE HALK BANKASI A.Ş.	HALKB
TÜRKİYE İŞ BANKASI A.Ş.	ISCTR
ŞEKERBANK T.A.Ş.	SKBNK
QNB FİNANSBANK A.Ş.	QNBFB
TÜRKİYE VAKIFLAR BANKASI T.A.O.	VAKBN
YAPI VE KREDİ BANKASI A.Ş.	YKBNK

The financial ratios used in the CAMELS analysis were taken into account in determining the evaluation criteria. CAMELS analysis is a rating system consisting of six components. These components are Capital Adequacy, Asset Quality, Management Adequacy, Earnings, Liquidity and Sensitivity to Market Risk, respectively. CAMELS analysis is an evaluation system created by supervisors in the USA and used in remote surveillance activities, especially for risk-based supervision of banks (Kaya, 2001). The system is actively used in

financial performance analysis methods of banks all over the world. As a result of the literature review, the two most frequently used financial ratio evaluation criteria in each component were determined in the CAMELS analysis. Determined evaluation criteria are shown in Table 2.

Table 2. Evaluation Criteria

	Criteria	**Code**	**Optimisation Direction**
C	Capital Adequacy Ratio	C1	max
	Total Equity/Total Assets	C2	max
A	Financial Assets/Total Assets	A1	max
	Total Loans/Total Assets	A2	max
M	Net Interest Income/Total Assets	M1	max
	Interest Expenses/Total Assets	M2	min
E	Return on Assets (ROA)	E1	max
	Return on Equity (ROE)	E2	max
L	Liquid Assets/Total Assets	L1	max
	Liquid Assets/Short-Term Liabilities	L2	max
S	Interest Income/Total Assets	S1	min
	Foreign Currency Assets/Total Assets	S2	min

The relevant evaluation criteria were obtained from the September 2021 financial statements of the decision alternatives included in the scope of the study and the database of the Banks Association of Turkey.

After the decision alternatives and evaluation criteria were determined, the financial performance analysis stages were started with the ARAS method.

Step 1. The decision matrix consisting of decision alternatives and evaluation criteria was created with the help of Equation (1) and shown in Table 3.

Table 3. Decision Matrix

Criteria	C1	C2	A1	A2	M1	M2	E1	E2	L1	L2	S1	S2
Banks/Direction of criterion	max	max	max	max	max	min	max	max	max	max	min	min
AKBNK	0,173	0,1272	0,0367	0,0651	0,0274	0,033	0,0133	0,1045	0,1791	0,0611	0,0604	0,3206
GARAN	0,173	0,1236	0,262	0,046	0,03	0,0165	0,0089	0,0131	0,16	0,0817	0,047	0,1081
HALKB	0,1343	0,0583	0,02123	0,0524	0,0073	0,0737	0,0077	0,1313	0,1059	0,0487	0,0737	0,0004
ISCTR	0,172	0,1068	0,3042	0,0654	0,0285	0,0594	0,0111	0,1042	0,1814	0,0816	0,0594	0,3886
SKBNK	0,1414	0,0655	0,1925	0,0292	0,0814	0,0003	0,0003	0,005	0,1719	0,0264	0,0814	0,3989
QNBFB	0,1521	0,0797	0,2684	0,0669	0,0266	0,0449	0,0084	0,1052	0,1583	0,0117	0,0449	0,3355
VAKBN	0,0988	0,0631	0,2739	0,076	0,0205	0,0435	0,0028	0,0449	0,1175	0,0769	0,0435	0,2937
YKBNK	0,1749	0,0998	0,2255	0,0754	0,0214	0,0416	0,0124	0,1243	0,1602	0,0305	0,0416	0,3099
Optimal Value	0,1749	0,1272	0,3042	0,076	0,0814	0,0003	0,0133	0,1313	0,1814	0,0817	0,0416	0,0004

Since the optimal values are not fully expressed in the decision matrix, the optimal values are calculated by determining the maximum and minimum properties with the help of Equation (2) and are shown in the bottom line of Table 3.

Step 2. Considering the values on the decision matrix, the normalization process was performed in order to make the alternatives comparable. According to the maximum or minimum evaluation criteria, the decision matrix was rearranged using Equation (3) and Equation (4) and the decision matrix normalized with the help of Equation (5) is shown in Table 4.

Table 4. Normalized Decision Matrix

Criteria	C1	C2	A1	A2	M1	M2	E1	E2	L1	L2	S1	S2
Banks/Direction of criterion	max	max	max	max	max	min	max	max	max	max	min	min
AKBNK	0,141861	0,175691	0,023163	0,13665	0,112711	0,008599	0,204931	0,165217	0,145102	0,145963	0,110508	0,001234299
GARAN	0,141861	0,170718	0,165359	0,096558	0,123406	0,017198	0,137134	0,020711	0,129628	0,195174	0,142014	0,003660651
HALKB	0,110127	0,080525	0,013399	0,109992	0,030029	0,00385	0,118644	0,207589	0,085798	0,11634	0,090565	0,98929097
ISCTR	0,141041	0,147514	0,191993	0,13728	0,117236	0,004777	0,171032	0,164743	0,146966	0,194935	0,112368	0,001018313
SKBNK	0,115949	0,09047	0,121495	0,061293	0,334842	0,94591	0,004622	0,007905	0,139269	0,063067	0,081998	0,000992019
QNBFB	0,124723	0,110083	0,169398	0,140428	0,10942	0,00632	0,12943	0,166324	0,128251	0,02795	0,148656	0,001179483
VAKBN	0,081017	0,087155	0,17287	0,15953	0,084327	0,006524	0,043143	0,070988	0,095196	0,183708	0,153441	0,001347349
YKBNK	0,143419	0,137845	0,142322	0,15827	0,08803	0,006821	0,191063	0,196522	0,12979	0,072862	0,160449	0,001276916
Optimal Value	0,143419	0,175691	0,191993	0,15953	0,334842	0,00385	0,204931	0,207589	0,146966	0,195174	0,081998	0,000992019

Step 3. A weighted normalized decision matrix is created as shown in Equation (8) with the calculation made using Equation (7) through the weights of the evaluation criteria determined with the help of Equation (6) over the normalized decision matrix. Evaluation criteria weights were calculated as equally weighted by accepting each of the criteria at the same level of importance. The weighted normalized decision matrix created is shown in Table 5.

Table 5. Weighted Normalized Decision Matrix

Weights	0,083	0,083	0,083	0,083	0,083	0,083	0,083	0,083	0,083	0,083	0,083	0,083
Criteria	C1	C2	A1	A2	M1	M2	E1	E2	L1	L2	S1	S2
Banks/Direction of criterion	max	max	max	max	max	min	max	max	max	max	min	min
AKBNK	0,011817	0,014635	0,001929	0,011383	0,009389	0,000716	0,017071	0,013763	0,012087	0,012159	0,009205	0,000102817
GARAN	0,011817	0,014221	0,013774	0,008043	0,01028	0,001433	0,011423	0,001725	0,010798	0,016258	0,01183	0,000304932
HALKB	0,009174	0,006708	0,001116	0,009162	0,002501	0,000321	0,009883	0,017292	0,007147	0,009691	0,007544	0,082407938
ISCTR	0,011749	0,012288	0,015993	0,011435	0,009766	0,000398	0,014247	0,013723	0,012242	0,016238	0,00936	8,48255E-05
SKBNK	0,009659	0,007536	0,010121	0,005106	0,027892	0,078794	0,000385	0,000658	0,011601	0,005254	0,00683	8,26352E-05
QNBFB	0,010389	0,00917	0,014111	0,011698	0,009115	0,000526	0,010782	0,013855	0,010683	0,002328	0,012383	9,82509E-05
VAKBN	0,006749	0,00726	0,0144	0,013289	0,007024	0,000543	0,003594	0,005913	0,00793	0,015303	0,012782	0,000112234
YKBNK	0,011947	0,011483	0,011855	0,013184	0,007333	0,000568	0,015916	0,01637	0,010812	0,006069	0,013365	0,000106367
Optimal Value	0,011947	0,014635	0,015993	0,013289	0,027892	0,000321	0,017071	0,017292	0,012242	0,016258	0,00683	8,26352E-05

Step 4. The values in the weighted normalized decision matrix were calculated with the help of Equation (9) and the optimality function values were calculated. Calculated values are shown in Table 6.

Step 5. By using the optimality function values with Equation (10), the utility degrees of the decision alternatives are calculated and the final ranking is obtained. Calculated benefit degrees and financial performance rankings are shown in Table 6.

Table 6. Optimal Function and Grades of Benefit

	Si	Ki	Ranking
AKBNK	0,114257	0,742636	5
GARAN	0,111907	0,727364	6
HALKB	0,162947	1,059109	2
ISCTR	0,127524	0,828871	3
SKBNK	0,163919	1,065424	1
QNBFB	0,105138	0,683368	7
VAKBN	0,094899	0,616816	8
YKBNK	0,119008	0,773519	4
Optimal Value	0,153853	1	

5. Conclusion

The pandemic crisis has affected the whole world since the beginning of 2020 and has become a crisis whose effects continue today. This crisis has deeply affected all world economies and every sector. Various measures implemented by the economies, especially the restrictions on international circulation, also adversely affected the financial system. Banks, which constitute the main element of the financial system, are among the sectors affected by the pandemic crisis. In addition to all the negative effects of the pandemic crisis, the opportunities it offers should not be ignored. As a result of the pandemic crisis, which coincided with a period in which the development of financial technologies, led by technological developments, accelerated, banks started to improve their service quality through online and remote systems by improving their distribution channels at the point of reaching their customers.

In this study, in which the financial performances of the deposit banks in the Borsa Istanbul Banking Index during the pandemic period were examined, the analysis was carried out using the evaluation criteria taken from the 2021 third quarter financial statements of the banks included in the analysis. The main reason for using the data of this last period is that it was the period when the pandemic crisis started to slow down. A total of 12 ratios, two financial ratios for each of the CAMELS components, were used as evaluation criteria. As an analysis method, multi-criteria decision making techniques, which are frequently used in financial performance analysis, were examined and it was decided to use the ARAS method. As a result of the analysis, Şekerbank was determined as the bank with the highest financial performance as of the third quarter of 2021. The second and third best performing banks were determined as Halkbank and İşbank, respectively. The lowest performing bank was determined as Vakıfbank.

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