A HOLISTIC APPROACH TO THE BANKING SECTOR: PERFORMANCE AND EFFICIENCY ANALYSIS OF TURKISH BANKS USING CoCoSo AND DEA METHODS

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Abstract

The banking sector is a vital component of global economies, playing a critical role in ensuring financial stability by gathering savings, providing credit, and facilitating various financial transactions. Banks not only support economic growth but also act as intermediaries between surplus and deficit units within the economy. Therefore, evaluating their financial performance and efficiency is crucial for understanding the overall health of the financial system. This study analyzes the financial performance and efficiency of the top 10 banks in Turkey, which are ranked by asset size, over a 10-year period from 2013 to 2022. Using the Combined Compromise Solution (CoCoSo) method, the study ranks these banks based on various financial criteria, such as capital adequacy, asset quality, liquidity, and profitability. CoCoSo is a multi-criteria decision-making method that allows for comprehensive performance analysis by considering multiple factors simultaneously. In addition to CoCoSo, Data Envelopment Analysis (DEA) is used to evaluate the efficiency of these banks in utilizing their resources to generate financial outputs. The study's findings reveal that privately-owned banks, particularly Akbank T.A.Ş., consistently rank at the top in terms of both financial performance and efficiency. Akbank's strong performance is attributed to its effective resource utilization and strategic management decisions. State-owned banks, on the other hand, generally show lower financial performance, even though they exhibit high efficiency levels. This discrepancy suggests that public banks may be focusing on non-profit-driven projects that contribute to public welfare, which in turn affects their overall financial performance. Foreign-owned banks, such as Garanti Bankası and Denizbank, also demonstrate strong financial performance but show varying degrees of efficiency, with Denizbank being relatively less efficient in resource utilization. By employing both the CoCoSo and DEA methods, this study offers a unique dual-method approach that provides a comprehensive evaluation of the Turkish banking sector. The combination of these two methods allows for a more nuanced understanding of both financial performance and efficiency, offering valuable insights for policymakers, bank management, and researchers. The study not only highlights the strengths and weaknesses of individual banks but also underscores the importance of efficient resource management for sustaining competitive advantage in a highly dynamic banking environment. The results of this study can serve as a robust framework for future research on bank performance evaluation, especially in emerging markets. Moreover, the study's methodology can be applied to other sectors or countries to provide cross-sectional and time-series analysis, contributing to the broader literature on financial performance and efficiency.
KEYWORDS: Banking, Financial Performance, Financial Efficiency, Multi-Criteria Decision-Making, Combined Compromise Solution, Data Envelopment Analysis
JEL classification: D53, G21, P17

Introduction

The internationalization of trade and the emergence of money-related institutions led to the emergence of the banco as a pioneer. The word "banco" refers to the table where the money changers conducted their transactions. In case of bankruptcy, the public would express this by breaking their "banco". This gave the term "bancrupt" to bankrupt people in Western languages. The expansion of the fields of activity of the money changers, accepting deposits and making transfers, transformed them into "deposit and transfer banks". Money trade emerged with the trade in goods and capital. The development of trade capital made banks an important part of economic life. (Aydın, 2010; 21).

Today, the banking sector plays a crucial role in the global economy. By fulfilling various tasks in financial markets, this sector contributes to the healthy functioning of the economy. The role of banking in financial markets includes enhancing capital mobility, providing liquidity, managing risks, and building resilience against economic fluctuations. Moreover, the credit facilities offered by banks support economic growth by providing financing opportunities to investors and entrepreneurs, infusing vitality into the business world.

The financial performance and efficiency of banks in financial markets can be regarded as an indicator of a country's economic health. Strong financial performance by banks can enhance economic stability and foster confidence in financial markets. Conversely, poorly performing banks may become vulnerable to economic crises, potentially causing issues in the overall financial system. Therefore, effective evaluation and monitoring of banks can help identify potential issues in financial markets before they occur.

In Turkey, the first banking activities in the modern sense started towards the end of the 19th century, during the Ottoman Empire. The first bank was established in 1847 by Galata Bankers under the name of Istanbul Bank. In the following years, the banking sector started to expand with the establishment of private banks. After the proclamation of the Republic, especially in the first half of the 20th century, various regulations and reforms were introduced to the banking sector in Turkey. In 1924, Türkiye İş Bankası, the first private sector bank, started operations, and in 1925, Türkiye Sanayi ve Maadin Bankası, the first development bank, was established (Parasız, 2014; 20). With the regulations made in the 1930s, steps were taken towards the establishment of the Central Bank and the auditing of the banking sector.

Developments in financial markets in the 1960s led Turkey to further modernize its banking sector. With the transition to a free market economy in the 1980s, the banking sector became more competitive. Privatizations and the inflow of foreign capital into the sector have contributed to the Turkish banking system becoming more in line with international standards. Moreover, in recent years, there have also been major developments in the field of digital banking due to technological advances. Banks operating in Turkey have rapidly adapted to digitalization and financial technologies and started to offer more effective and diverse services to customers. This evolution is considered to have made Turkey's banking sector stronger and more competitive.

As of 2023, according to the Banks Association of Turkey, the number of banks in Turkey reached 58. Of these, 32 were deposit banks, 3 were banks transferred to the Savings Deposit Insurance Fund (TMSF), 17 were development and investment banks, and 6 were participation banks. However, in parallel with digitalization and changes in customer preferences, the downward trend in the number of branches continued until December 2022. According to data from the Banks Association of Turkey, the number of branches decreased by 131 units from 9,792 in 2021 to 9,661 in 2022. As of March 2023, the number of branches is 9,667. Despite the decrease in the number of branches due to digitalization and the positive contribution provided by technology, the decrease in the number of personnel, which started in 2018, continued until 2021, and showed an increase again in 2022. In 2021, the number of employees increased by 3,439 from 185,248 to 188,687. This increase continued in 2023. According to March 2023 figures, the total number of employees in the sector is 191,209. With the impact of technological transformation and digitalization, the trends in the number of branches and personnel of banks are expected to continue in 2023 and beyond. On the other hand, digital banking is developing rapidly in Turkey as in the rest of the world. According to data published by the Banks Association of Turkey (TBB), the number of active digital banking customers in 2022 increased by 16 million 549 thousand people compared to the previous year and reached 94 million 390 thousand people (Vardar, 2023; 9).

This study examines the comparative analysis of the performance of banks in Turkey using the Combined Compromise Solution (CoCoSo) method, which was introduced to the literature in 2019. CoCoSo is a new method among multi-criteria decision-making techniques and is an effective tool providing a combined solution for financial performance analysis. In the second phase of the study, the efficiency of the banks was measured using Data Envelopment Analysis (DEA). DEA is a frequently used method in financial efficiency measurement.

This study aims to fill this gap by applying the CoCoSo and DEA methods to the top 10 banks in Turkey, ranked by asset size. The novelty of this research lies in its dual-method approach, which combines CoCoSo's comprehensive performance ranking with DEA's efficiency measurement. This methodology offers a more nuanced understanding of the banking sector's dynamics and provides robust insights for policymakers and stakeholders in the financial industry.

Literature Review

In the literature, several studies have analyzed bank performance and efficiency using various data sets and methods. In this regard, some of these studies have been mentioned in this section.

Önder, Taş, and Hepşen (2013) converted subjective and objective assessments of financial stakeholders into a quantitative format to rank the financial performance of Turkish banks. Their study found that Akbank had the best financial performance among the banks analyzed.

Sáez-Fernández, Picazo-Tadeo, and Beltrán-Esteve (2015) assessed the technical efficiency of domestic and foreign banks in Latin America and the Caribbean. The findings indicated that foreign banks were more efficient due to their advanced technology.

Chu (2016) explored the relationship between financial openness and the performance of Chinese banks. The study concluded that financial openness positively affected bank performance.

Mousa, Judit and Zeman (2018) examined the impact of credit and capital risk on the performance of Syrian private banks from 2009 to 2016. It emphasized the crucial role of risk in banking success and stability, highlighting the need for effective risk management mechanisms. The study focused on six selected Syrian private banks and analyzed their financial data to examine the relationship between credit risk, capital risk, and banking performance, measured by return on equity (ROE). The research methodology involved regression analysis and descriptive statistics using SPSS software. The findings contributed to the understanding of how risk factors influence the profitability and sustainability of banks in the Syrian financial market.

Yazdi, Hanne, and Osorio Gómez (2020) evaluated the performance of Colombian banks using a hybrid approach that combined the Balanced Scorecard (BSC) and Multicriteria Decision Making (MCDM) methods. The results indicated that the International Bank of Colombia exhibited superior performance.

Wasiaturrahma et al. (2020) assessed the efficiency performance of conventional and Islamic rural banks in Indonesia. The findings revealed that while the banks were efficient in production, they were inefficient in their intermediation role.

Saez-Fernandez, Picazo-Tadeo, and Beltran-Esteve (2021) evaluated the technical efficiency of Brazilian banks. Their study highlighted that investment banks outperformed commercial banks due to superior management efficiency.

Lileikienė, Obi and Valackienė (2021) evaluated the safety and profitability of EU and US banks post-Basel III regulations. It emphasized the significance of the Capital Adequacy Ratio (CAR) in measuring bank safety and absorbing losses. While both regions have improved safety standards with higher CAR and liquidity ratios, profitability has been a concern, particularly in the EU. Basel III has led to increased regulatory requirements and mixed impacts on bank performance, prompting ongoing research on its effectiveness in ensuring financial stability.

AÇiftaslan and Rençber (2022) analyzed the performance of systemically important banks in Turkey

using IDOCRIW and CoCoSo methods. The study noted increasing performance trends for Ziraat Bank, İş Bankası, and Garanti Bank.

Sharma and Kumar (2023) prioritized sustainability performance indicators for Indian banks, with environmental dimensions ranking highest in importance.

Data and Methodology

This study was conducted on the 10 banks with the largest asset value operating in Turkey according to the 2023 data of the Banks Association of Turkey. The banks and their ownership status are shown in Table 2. The study covers the period between 2013 and 2022. Since the year-end financial ratios for 2023 have not yet been published, the year 2023 is not included in the study. The financial ratios of banks are taken from the database of the Banks Association of Turkey. The financial performance of the banks included in the study was analyzed using the CoCoSo method. The method, which was introduced to the literature by Yazdani et al. in 2019, was preferred because it offers a combined solution and there is not enough application in the financial literature. In the second stage, Data Envelopment Analysis (DEA) was used to measure the efficiency of banks. In this way, both the financial performance and efficiency of banks are analyzed in order to provide a holistic approach to the overall outlook of banks.

Table 2. Bank Ownership Status

Name of the Banks	Ownership
Türkiye Cumhuriyeti Ziraat Bankası A.Ş.	Public Capital (State-Owned)
Türkiye Halk Bankası A.Ş.	Public Capital (State-Owned)
Türkiye Vakıflar Bankası T.A.O.	Public Capital (State-Owned)
Akbank T.A.Ş.	Private Capital (Privately Owned)
Türk Ekonomi Bankası A.Ş.	Private Capital (Privately Owned)
Türkiye İş Bankası A.Ş.	Private Capital (Privately Owned)
Yapı ve Kredi Bankası A.Ş.	Private Capital (Privately Owned)
Denizbank A.Ş.	Foreign Capital (Foreign Owned)
QNB Finansbank A.Ş.	Foreign Capital (Foreign Owned)
Türkiye Garanti Bankası A.Ş.	Foreign Capital (Foreign Owned)

The financial ratios used in the study to rank banks in terms of financial performance are given below (The preferred status for the financial ratio is indicated in parentheses).

- Capital Adequacy Ratio (MAX)
- Equity / Total Assets (MAX)
- Nonperforming Loans / Total Loans (MIN)
- Long Term Assets / Total Assets (MIN)
- Liquid Assets / Total Assets (MAX)
- Liquid Assets / Short-Term Liabilities (MAX)
- Return on Average Assets (MAX)
- Return on Average Equity (MAX)

- Net Interest Income After Special Provisions / Total Assets (MAX)
- Interest Expenses / Total Expenses (MIN)

Within the scope of the study, the CoCoSo method was used to rank banks in terms of financial performance. The steps of the CoCoSo method are as follows (Ecer, 2020; 301).

Step 1: In the first step, an initial decision-making matrix consisting of m alternatives and n criteria is created.

$$X = \begin{bmatrix} a_{11} & a_{12} \dots \dots & a_{1p} \\ a_{21} & a_{22} \dots \dots & a_{2p} \\ \vdots & \vdots \quad \dots \dots & \vdots \\ a_{m1} & a_{m2} \dots \dots & a_{mp} \end{bmatrix}$$

Step 2: Normalize the benefit and cost criteria. Thus, a normalized matrix is obtained. Equation 1 is used for the normalization of the benefit criteria (max) and Equation 2 is used for the normalization of the cost criteria (min).

Equation 1:
$$n_{ij} = \frac{x_{ij} - min x_{ij}}{max x_{ij} - min x_{ij}} \quad (i=1,\dots,m \ ve \ j=1,\dots,p)$$

Equation 2:
$$n_{ij} = \frac{max x_{ij} - x_{ij}}{max x_{ij} - min x_{ij}} \quad (i=1,\dots,m \ ve \ j=1,\dots,p)$$

Step 3: S_i and P_i values are calculated. Si is calculated as in equation 3 and P_i is calculated as in equation 4. To obtain S_i and Pi values, the weights of the criteria must be found. In the literature, there are objective and subjective methods used as criteria weighting methods. However, these methods may give high weights to some criteria. Therefore, in this study, S_i and P_i values were calculated by giving equal weight to all criteria.

Equation 3:
$$S_i = \sum_{j}^{n} (w_j n_{ij})$$

Equation 4:
$$P_i = \sum_{j}^{n} (n_{ij})^{w_j}$$

Step 4: Three evaluation strategies ($\xi_{ia}, \xi_{ib}, \xi_{ic}$) are calculated using equations 5, 6, and 7 below. These values are also the relative performance scores of the alternatives. In Equation 7, the value of a is usually chosen as 0.5. However, the choice of λ value depends on the decision maker. In this study, 0.5 is used as λ value.

Equation 5:

$$\xi_{ia} = \frac{P_i + S_i}{\sum_{i=1}^{m}(P_i + S_i)}$$

Equation 6:

$$\xi_{ib} = \frac{S_i}{min_i\, S_i} + \frac{P_i}{min_i\, P_i}$$

Equation 7:

$$\xi_{ib} = \frac{\lambda(S_i) + (1-\lambda)(P_i)}{(\lambda max_i\, S_i + (1-\lambda)(max_i\, P_i))}; 0 \le \lambda \le 1$$

Step 5: Using equation 8, the final rankings of the alternatives are determined. The alternatives are ranked in descending order according to their ξ_i scores. The alternative with the highest ξ_i is also the alternative with the best performance.

Equation 8:

$$\xi_i = (\xi_{ia} \cdot \xi_{ib} \cdot \xi_{ic})^{\frac{1}{3}} + \frac{1}{3}(\xi_{ia} \cdot \xi_{ib} \cdot \xi_{ic})$$

In the second stage of the research, the efficiency levels of banks were analyzed. The DEA methodology is divided into two main models: the Charnes-Cooper-Rhodes (CCR) model for input and output under the assumption of constant returns to scale and the Banker-Charnes-Cooper (BCC) model that accepts the assumption of variable returns to scale.

In determining the DEA model, it was examined which of the input and output variables could be controlled more by the bank. Considering that banks have more control over input variables, the input-oriented CCR model was used under the assumption of constant returns to scale. The following input variables and output variables of the banks were used for efficiency analysis.

Input Variables
- Number of Branches
- Number of Staff

Output Variables
- Total Deposits
- Total Loan
- Net Profit (Loss)

The steps of the DEA method are as follows (Yıldırım & Önder, 2018; 209).

$$maxh_0 = \frac{\sum_{r=1}^{s} u_r y_{ro}}{\sum_{i=1}^{m} v_i x_{io}}$$

Constraints:

$$\frac{\sum_{r=1}^{s} u_r y_{ro}}{\sum_{i=1}^{m} v_i x_{io}} \le 1 ; \; j = 1, \dots, n$$

$$u_r v_i \ge 0 \quad i = 1,2,\dots,m$$
$$r = 1,2,\dots,s$$

x_{io}: the quantity of i. input of the o. decision-making unit whose efficiency is measured.

y_{ro}: the quantity of r. the output of the o. decision-making unit whose efficiency is measured.

x_{ij}: i. input quantity of the j. decision unit

y_{rj}: i. output quantity of the j. decision unit

u_r: the weight is given to output r by decision unit o.

v_i: the weight given to input i by decision unit o.

m : number of inputs
s : number of outputs
n : number of decision-making units

Findings

As a result of the analysis, financial performance rankings and efficiency ratios of banks are shown in Table 3 on a yearly basis. Banks with an efficiency value of 1,00 were accepted as efficient. In the table, the financial performance rankings, and efficiency ratios of banks on a yearly basis are shown separately in detail. In general, we focus on the average performance of banks over a 10-year period.

When the table is analyzed, it is seen that Akbank T.A.Ş, a privately owned bank, has the best performance in terms of both financial performance and efficiency ratios according to the 10-year average. At the beginning of the review period, the bank's performance was in the middle ranks, but it has improved its performance over the years. As of 2019, it ranks first in terms of financial performance. Operating since 1948, the bank's strong corporate governance approach, having qualified bank staff as intellectual capital, and having a value maximization-oriented approach can be counted as effective factors in the bank's performance. In addition, when the bank is evaluated in terms of stock returns in the long term, it can be seen that it provides a stable return to its investors. On the other hand, in terms of efficiency, it is seen that it has the efficiency criterion of 1.00 in all periods. This can be interpreted as the bank uses its resources efficiently.

Türkiye İş Bankası A.Ş. ranks second in terms of financial performance. Although its performance in 2022 is below average, it is the second bank with the highest performance over the 10-year period. In terms of efficiency, the bank has an efficiency score below 1.00. This can be interpreted as the bank does not use its resources efficiently. In other words, it can be said that the bank is not at the desired level in terms of total deposits, total loans and net profit (loss) values compared to the number of personnel and the number of branches.

In terms of financial performance, Türkiye Garanti Bankası A.Ş. ranks third along with Denizbank A.Ş. Both of these banks are foreign capitalized banks. While ranking third among the banks analyzed in terms of financial performance, the efficiency score of Türkiye Garanti Bankası A.Ş. was determined as 0.98. This is quite close to the efficiency value of 1.00. In this respect, it can be said that Türkiye Garanti Bankası A.Ş. carries out its activities at a level close to the efficiency ratio. However, when the efficiency ratio of Denizbank A.Ş. is analyzed, it is seen that the 10-year average efficiency level of the bank is 0.49. This is the lowest level of efficiency among the banks analyzed. In this sense, it can be said that while the bank has solid financial ratios in terms of financial performance, it is quite far from the efficiency ratio in terms of efficiency. This situation can be interpreted as the bank's inefficient use of resources that are considered as inputs.

Privately owned Yapı Kredi Bankası A.Ş. ranks fourth in terms of financial performance with an efficiency ratio of 0.94. The efficiency level is close to the efficiency score of 1.00.

Foreign-owned QNB Finansbank A.Ş. and state-owned Ziraat Bankası A.Ş. share the fifth place. However, while Ziraat Bankası A.Ş. has an efficiency score of 0.94, QNB Finansbank has a low efficiency ratio of 0.68. It may be possible for the bank to improve its financial performance by utilizing its operational resources efficiently.

Türkiye Ekonomi Bankası A.Ş. is the lowest performing private bank among the banks analyzed. In terms of efficiency ratio, with a score of 0.53, it is far from the efficiency ratio of 1.00. It is thought that taking measures to increase the efficiency ratio of the bank will also affect the financial performance of the bank.

State-owned Türkiye Vakıflar Bankası T.A.O. and Türkiye Halk Bankası A.Ş. are at the bottom in terms of financial performance. Although their efficiency ratios are close to the efficiency ratio of 1.00, their financial performance is lower than other banks.

Table 3. Financial Performance Ranking and Efficiency Ratios of Banks

Part of the article	Performance / Efficiency	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Average
Akbank T.A.Ş.	Perf. Ranking	8	5	5	5	1	2	1	1	1	1	3
	Eff. Score	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
Türkiye İş Bankası A.Ş.	Perf. Ranking	5	4	2	2	4	6	2	2	3	6	3,6
	Eff. Score	0,88	0,88	0,81	0,77	0,74	0,79	0,82	0,75	0,84	0,81	0,81
Türkiye Garanti Bankası A.Ş.	Perf. Ranking	2	2	4	4	3	5	5	7	6	2	4
	Eff. Score	1,00	1,00	1,00	0,99	0,93	1,00	1,00	0,91	1,00	0,96	0,98
Denizbank A.Ş.	Perf. Ranking	10	10	1	1	2	1	6	4	2	3	4
	Eff. Score	0,48	0,51	0,46	0,48	0,47	0,53	0,51	0,45	0,49	0,49	0,49
Yapı ve Kredi Bankası A.Ş.	Perf. Ranking	3	6	9	9	8	3	3	3	4	4	5,2
	Eff. Score	1,00	0,93	0,92	0,95	0,94	1,00	0,96	0,86	0,95	0,91	0,94
QNB Finansbank A.Ş.	Perf. Ranking	6	3	10	6	6	4	4	5	5	7	5,6
	Eff. Score	0,53	0,57	0,54	0,51	0,59	0,72	0,81	0,76	0,85	0,89	0,68
Türkiye Cumhuriyeti Ziraat Bankası A.Ş.	Perf. Ranking	1	1	3	3	5	9	9	9	8	8	5,6
	Eff. Score	0,84	0,93	0,94	0,80	0,89	1,00	1,00	1,00	1,00	1,00	0,94
Türk Ekonomi Bankası A.Ş.	Perf. Ranking	7	8	7	7	10	8	7	6	7	5	7,2
	Eff. Score	0,59	0,62	0,62	0,56	0,52	0,52	0,52	0,47	0,47	0,42	0,53
Türkiye Vakıflar Bankası T.A.O.	Perf. Ranking	4	7	6	8	7	7	8	8	9	9	7,3
	Eff. Score	0,89	0,92	0,85	0,83	0,83	0,96	1,00	1,00	1,00	1,00	0,93
Türkiye Halk Bankası A.Ş.	Perf. Ranking	9	9	8	10	9	10	10	10	10	10	9,5
	Eff. Score	1,00	0,96	0,84	0,85	0,88	1,00	1,00	1,00	0,97	0,86	0,94

Overall, on the basis of average values over a 10-year period, the findings of the analysis show that privately owned banks have high performance in terms of financial performance and efficiency. However, the Türk Ekonomi Bankası A.Ş. is an exception. It is thought that the internal factors of the bank are effective in this situation. On the other hand, while the average efficiency values of state owned banks are close to the efficiency value of 1,00, they have low performance in terms of financial performance. This may be due to the fact that state-owned banks sometimes invest in some low-efficiency projects for the public interest instead of investing in profitable and efficient projects without considering profitability.

Conclusions

The financial performance of banks is critical in terms of its ability to provide information about the overall state of the economy and the impact of bank performance on stakeholder and investor decisions. The healthy financial performance of banks is considered an important indicator of the overall state of the economy. For

example, bank indicators such as loan growth, the amount of deposits and profitability ratios provide information on the vitality and stability of the economy. Moreover, increased risks in a bank's loan portfolio or significant declines in profitability may indicate that the economy has entered a challenging period. Therefore, monitoring the financial performance of banks can provide clues about the future direction of the economy.

Bank performance is also an important determinant for stakeholders and investors. Investors shape their investment decisions by assessing banks' profitability, capital structure and risk management. Moreover, since the financial health of banks is a reflection of overall economic conditions, this information is also an important reference point for companies and industries operating in other sectors.

This study is important in terms of revealing the overall financial performance of the 10 banks with the largest asset size operating in Turkey. The findings show that the financial performance of private and foreign owned banks, as calculated based on their financial ratios, is relatively better than that of state-owned banks. In this respect, the findings obtained are similar to the results

obtained by Yıldız (2010), Ünal and Yüksel (2017), Aydın Ünal (2019), Demir (2021) and Akgül (2021).

The comprehensive analysis of the financial performance and efficiency of banks in Turkey has provided valuable insights into the dynamics of the banking sector. The findings underscore the prominent position of private banks, particularly Akbank T.A.Ş, in terms of both financial performance and efficiency over the 10-year period. This not only highlights the competitive edge of private banks but also underscores their pivotal role in shaping the financial landscape. Also, it will contribute to the financial performance of banks with low financial performance to determine policies that can improve their performance by comparing their operations with banks with high performance in the sector, such as Akbank T.A.Ş.

On the other hand, except Akbank T.A.Ş., all other banks have an efficiency value below 1.00. This situation shows that banks do not carry out their operations efficiently. It is thought that taking measures and adopting policies to increase the efficiency of the banks in this situation will increase both the efficiency and financial performance levels of the banks.

The multi-criteria decision-making approach employed in this study has enriched the understanding of the factors influencing the performance and efficiency of banks, offering a nuanced perspective that can inform strategic decision-making and policy formulation. Moreover, multi-criteria decision-making methods allow analysis based on many factors affecting the performance of banks and companies, making it an effective method of analysis. The introduction of new methods to the literature in the following years and the analyzes made with these methods are very important in terms of contributing to the literature. Similarly, analyses to be conducted in different countries and with different data sets in the following years are very important in terms of contribution to the literature.

As the banking sector continues to evolve in response to dynamic economic forces, the insights gleaned from this study can serve as a valuable resource for stakeholders, policymakers, and researchers. By shedding light on the intricate interplay of financial performance and efficiency, this research contributes to the ongoing discourse on banking sector analysis, paving the way for informed strategies aimed at enhancing the overall health and resilience of the financial system.

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