

A Financial Performance Evaluation in the Retail Sector with the MAIRCA and CRITIC Methods

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Abstract: The retail sector is in a constant transformation parallel with economic fluctuations and changing consumer demands. The purpose of this study is to analyze the financial performance of firms in the retail sector between 2014 and 2023 using the CRITIC and MAIRCA methods. While the CRITIC method determines the importance levels of financial indicators of firms, the MAIRCA ranks firms by comparing their annual performances. These analyses aim to identify the leading and declining firms in the sector based on financial indicators such as return on assets, liquidity, productivity, and debt utilization ratios. As a result, Metro Petrol and Tesisleri has maintained its leadership over the years, while firms such as Artemis Halı and Doğan Holding have also been ranked highly, and firms such as Bim Mağazalar and Migros Ticaret have shown more stable performances, thereby improving their rankings in some years. The study aims to contribute to the determination of strategic financial orientations for the retail sector by assessing the strengths and weaknesses of firms in the sector.

Keywords: Financial Performance, Retail Sector, MAIRCA, CRITIC

Jel Codes: D53, E44, G1

Perakende Sektöründe MAIRCA ve CRITIC Yöntemleri ile Finansal Performans Değerlendirmesi

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Öz: Perakende sektörü, ekonomik dalgalanmalara ve değişen tüketici taleplerine paralel olarak sürekli bir dönüşüm içindedir. Bu çalışmanın amacı, 2014-2023 yılları arasında perakende sektöründeki firmaların finansal performanslarını CRITIC ve MAIRCA yöntemleriyle analiz etmektir. CRITIC yöntemi, firmaların finansal göstergelerinin önem derecelerini belirlerken, MAIRCA ise firmaların yıllık performanslarını karşılaştırarak sıralamalarını yapmaktadır. Bu analizler, aktif karlılık, likidite, verimlilik ve borç kullanım oranları gibi finansal göstergeleri temel alarak, sektörün lider firmalarını ve gerileyen firmalarını belirlemeyi hedeflemektedir. Sonuç olarak, Metro Petrol ve Tesisleri, yıllar boyunca liderliğini sürdürürken, Artemis Halı ve Doğan Holding gibi firmalar da yüksek sıralamalarda yer almış; Bim Mağazalar ve Migros Ticaret gibi firmalar daha istikrarlı performanslar sergileyip bazı yıllarda sıralama iyileştirmeleri gerçekleştirmiştir. Çalışma, sektördeki firmaların güçlü ve zayıf yönlerini değerlendirerek, perakende sektörü için stratejik finansal yönelimlerin belirlenmesine katkı sağlamayı amaçlamaktadır.

Anahtar Kelimeler: Finansal Performans, Perakende Sektörü, MAIRCA, CRITIC

Jel Kodları: D53, E44, G1

1. Introduction

Performance measurement of businesses is of great importance for both general business management and financial management. Financial performance measurement, which is a subject that concerns different interests of business managers, owners, lenders,

investors, government, and the public, has been and continues to be the subject of numerous academic studies (Yıldırım & Meydan, 2021). This is especially evident in the retail sector, where competition is intense.

Retail trade is a sector that shows rapid development all over the world and represents an important part of the manufacturing sector. The retail sector can be defined as offering products individually or in small quantities by businesses according to consumer demand (Kayacan, 2017; İtik & Sel, 2021). In this sector where competition is intense, marketing activities are of great importance for gaining new customers and retaining existing customers (Koç & Sakalsız, 2024).

The retail sector consists of four main sectors: non-food, automotive fuel, food, beverages, and tobacco. The non-food sector includes different sub-sectors such as postal or internet shopping, computers, books and communication devices, textiles, clothing and footwear, medical products, cosmetics, electrical goods, and furniture (Keskin Benli and Özdemir, 2023). This diversity reflects the dynamic structure of the retail sector and the highly competitive environment.

The development of the sector can be observed more clearly by evaluating the pros and cons of the major players relative to each other. In this context, analyzing the performance of the retail sector over the years is critical for the future of the sector (Kazak, 2023). The financial performance of businesses is generally reflected in their financial statements, and these statements are an important indicator that affects the short- and long-term decisions of the business (Aktulum & Umut, 2022).

Financial indicators of enterprises are frequently used in financial performance measurement. Such sector-based comparisons enable firms to compare with each other and obtain more meaningful results (Pala, 2022). The retail trade sector consists of enterprises engaged in retail trade of goods without transformation and has become one of the fastest-growing sectors both in our country and in the world in recent years. This development also contributes to the creation of a large employment sector (Satır, 2020).

In this context, methods such as MAIRCA and CRITIC are highly effective tools for understanding and evaluating the financial performance of the retail sector. MAIRCA is a method used in multi-criteria decision-making processes and allows for a more objective assessment of the key players and performances in the sector, while the CRITIC method is used to analyze financial indicators, enabling the identification of strengths and weaknesses within the sector.

The main objective of this study is to reveal the relative strengths and weaknesses in the retail sector by analyzing the financial performance of retail businesses through multi-criteria decision-making approaches. For this purpose, the CRITIC method, which enables the objective determination of criterion weights, and the MAIRCA method, which enables the performance ranking of alternatives, were used together. The CRITIC method takes into account the information density based on the variance and correlations between the criteria; thus, it objectively reveals the contribution of each criterion to the decision process. The MAIRCA method, on the other hand, measures the closeness of the alternatives to the ideal solution based on these weights and performs the performance evaluation in a holistic manner. The combined use of these methods provides both an analytical and consistent evaluation process in line with the objective of the study, thus enabling intra-industry comparisons to be made in a healthier and more meaningful manner.

2. Literature Review

Many academic studies have examined the financial performance of firms in the retail sector in Borsa Istanbul, and the results have provided important clues in determining the competitiveness of companies in the sector.

Top Performance Indicators and Future Strategic Recommendations: Mazman, İtik, & Sel (2021) analyzed the financial performance of nine retail companies in Borsa Istanbul and ranked Mipaz, Casa, and Vakko in the top three while determining the order of the

other companies. Similarly, Karapolat & Ceyhan (2022) found that Adese Alışveriş Merkezleri Ticaret A.Ş. exhibited the highest performance over a six-year period, while the financial performance of other firms varied over time. Yıldırım & Meydan (2021), on the other hand, found that they can effectively measure short-term performance changes by using a small number of ratios and that certain firms stand out in this sense.

Reflection of Pandemic and External Effects on Performance: In their study, Keskin Benli & Özdemir (2023) concluded that the Covid-19 pandemic had an impact on the financial performance of 13 retail trade enterprises in Borsa Istanbul, but this effect varied on a sectoral basis. It was determined that non-food sectors stood out, especially technology and clothing sectors, which were more positively affected by the pandemic conditions. Similarly, Gül & Erdem (2022) reveal the changes in the performance of retail companies by comparing the pre-Covid-19 and Covid-19 periods.

The Relationship between Financial Ratios and Performance: Şenkal & Öztel (2020) analyzed Carrefoursa's performance in 2014-2018 and found that 2015 was the most successful year, while the failure in 2017 was associated with the decline in return on equity. At the same time, Kısakürek & Satır (2020) analyzed the financial performance of retail companies traded on the BIST using liquidity ratios and net working capital turnover ratios and pointed out that there are differences between return on investment and performance rankings. These two studies emphasize the critical role of financial ratios and certain economic indicators in the performance of companies.

The Role of Multi-Criteria Decision-Making Methods: Pala (2022) analyzed the companies in the retail trade index in BIST by using MSM and WSM methods to evaluate financial success. In this analysis, ranking the financial indicators and optimizing the weights of the factors revealed the areas where companies can outperform their competitors. This methodology also provides important information on the areas where companies need to make improvements. Similarly, Koç & Sakalsız (2024) examined the impact of marketing and selling expenses on financial performance using panel data analysis and concluded that some expenses do not have a significant impact on financial indicators.

Sectoral Performance Assessments: Kazak (2023) and Sariay & Bağcı (2020) found that BİM's financial performance stands out across the sector and shows the highest success in performance rankings. These findings reveal which players are the strongest in the sector and which factors support this success. Kazak (2023) also emphasized that by providing important comparisons for the retail sector, further contributions can be made through future analyses.

In terms of MAIRCA and CRITIC, many academic studies have reached important findings by analyzing economic and financial performances in different sectors with multi-criteria decision-making (MCDM) methods. These studies generally addressed sectoral differences, the effects of external influences on performance, and the impact of extraordinary circumstances such as pandemics on performance evaluations.

Sectoral and Temporal Changes in Economic and Financial Performance:

Lukić (2023) analyzed the economic performance of Bosnia and Herzegovina in 2013-2022 with DIBR and MAIRCA methods and determined 2020 as the lowest performance year due to the Covid-19 pandemic. It is emphasized that economic recovery has been achieved in recent years with factors such as digitalization and sustainable development. Similarly, Aydın (2020) analyzed the performance of state-owned banks in the Turkish banking sector with CRITIC and MAIRCA methods and revealed that there are performance differences between participation, deposit, and development-investment banks. In this context, Ziraat Participation Bank, Vakıflar Bank, and Turk Eximbank are ranked as the most successful banks for 2019.

Similar findings have been obtained in performance analyses conducted in various sectors. Günay & Ecer (2022) analyzed 17 sectors in Turkey's real sector and reported that the manufacturing sector showed the highest performance in terms of economic contribution, while the health and social services sectors stood out in terms of financial

performance. Kehribar et al. (2021) analyzed the enterprises in the Borsa Istanbul Food and Beverage Index during the Covid-19 pandemic and found that the G7 (FRIGO) company performed the best during the pandemic, while the G19 (TKURU) company performed the worst.

Ranking and Alternative Selection with Multi-Criteria Decision-Making Methods:

Ayçin & Güçlü (2020) evaluated the financial performance of firms in the Borsa Istanbul Trade Index by using the Entropy and MAIRCA methods and determined cash ratio, acid test ratio, and asset turnover rate as the most important financial performance criteria and ranked MİLPA, SANKO Pazarlama, and TEKNOSA as the firms with the highest performance. Similarly, Maruf & Özdemir (2023) analyzed the service performance of websites in the tourism sector with CRITIC and MAIRCA methods and found live support and number of complaints as the most determinant criteria and ranked tripadvisor.com and seyahatyanımda.com as the websites with the highest performance.

Use of Multi-Criteria Methods in Other Sectors:

Nguyen (2022) emphasized that by using multi-criteria decision-making methods in PMEDM processes, the most suitable alternative was determined by optimizing surface roughness and material removal rate and that this approach offers an effective solution for multi-criteria problems. A similar approach was used by Ecer et al. (2022) to evaluate cryptocurrencies in terms of investment, and Ethereum, Tether, and Bitcoin were determined to be the most suitable investment instruments.

Macroeconomic Performance Comparisons and Defense Strategy Selection:

Belke (2020) compares the macroeconomic performance of G7 countries using CRITIC and MAIRCA methods and finds that Germany has the highest performance and Italy has the lowest performance. Tesic (2023), on the other hand, used DIBR and MAIRCA methods in strategy selection in the defense system and achieved stable results by handling uncertainty well in strategy selection.

As a result, these studies have demonstrated that multi-criteria decision-making methods can be used effectively in many different areas, such as economic and financial performance analysis, sector comparisons, strategy optimization and evaluation of investment instruments, and that the effects of various factors on performance can be analyzed in depth.

Although there are many studies in the literature on evaluating the financial performance of firms operating in the retail sector, a significant number of these studies have been conducted with a limited number of years and firm data, and the methods used have generally been limited to financial ratio analysis or basic statistical comparisons. Moreover, the number of studies that comprehensively address the temporal variation of sectoral performance and utilize multi-criteria decision-making (MCDM) methods together is quite limited. In this context, this study evaluates the financial structure, liquidity and operational efficiency of retail firms listed on Borsa Istanbul (BIST) over the period 2014-2023 by using CRITIC and MAIRCA methods in an integrated manner, thus making a unique contribution to both the methodological limitation and the gap in the literature on long-term performance monitoring. The findings reveal the dynamic structure of intra-industry competition and enable strategic implications for sustainable financial success by analyzing the position changes of leading and lagging firms over the years with a holistic approach.

3. Data and methods

In this title, the purpose of the research, the importance of the research, the method of the research, the sample of the research and the methods used in the research are explained.

3.1. Purpose of the Study

Performance Analysis of the Retail Sector: Comparison of MAIRCA and CRITIC Methods" aims to analyze the financial and economic performance of companies in the

retail sector by using MAIRCA (Multi-Attribute Ideal-Real Comparative Analysis) and CRITIC (Criteria Importance Through Intercriteria Correlation) methods and to compare the effectiveness of these methods. By using both methods, the paper aims to identify important performance criteria in the retail sector, objectively calculate the weights of these criteria and examine the differences between the results provided by the methods. This study provides an important guide for decision makers in the retail sector to determine which methods provide more reliable results and which criteria should be prioritized.

3.2. Importance of Research

It enables a more objective, accurate and comprehensive assessment of the financial and economic performance of companies in the retail sector. The retail sector plays a critical role in many important macroeconomic indicators such as economic growth, consumer spending and employment. Therefore, accurately analyzing the performance of companies in the sector is crucial for developing effective strategies both at the sectoral level and at the individual company level. The use of multi-criteria decision-making methods such as MAIRCA and CRITIC makes it possible to evaluate various and sometimes conflicting performance factors in the industry together, leading to more reliable results. By comparing the effectiveness of both methods, this study aims to reveal which method provides more accurate, valid and reliable results. This will help companies in the sector make more informed and efficient decisions, improve their strategic planning and provide competitive advantage.

3.3. Research Methodology

In this chapter, CRITIC (Criteria Importance Through Intercriteria Correlation) and MAIRCA (MCDM-based Approach for International Rankings and Comparative Analysis) methods are used to evaluate the financial performance of firms in the retail sector. Both methods are multi-criteria decision-making (MCDM) techniques that allow determining the importance of different financial indicators and comparing the performance of firms. The steps of this method are given under the following headings.

3.3.1. Critic Method

Criteria Importance Through Intercriteria Correlation is shortened to the "critic method." The significance of criteria in regard to intercriteria correlation is what it means. As a result, as indicated by its name, the approach was chosen for this study in order to ascertain the degree of significance by considering the correlation between the variables related to dividend payments. The interdependence of dividend variables is ignored when weights are determined solely on the basis of numerical magnitude, neglecting correlation, which produces inconsistent outcomes. As a result, the critical approach is recommended. Furthermore, one of the methods for objective evaluation found in the literature is the Critic method. Because the Critic technique is an objective approach that solely relies on the stages being followed, other approaches—like subjective assessment or survey results—are subjective (Diakoulaki et al., 1995, p. 764-765).

Critic method has 5 steps (Madic & Radovanovic, 2015, p. 199-200):

Step 1: Creating a decision matrix

In this step, the study data set is transformed into a decision matrix. The choice matrix, which is shown in matrix number 1, has rows that stand for alternatives and columns that stand for criteria.

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

Step 2: Normalization process

To shift the study data set to a specific numerical range, the data are standardized in the second phase. Formula number two is applied in this procedure if the criterion is

positive, while formula number three is applied if it is negative. The rationale behind this discrepancy is not to normalize the positive and negative criteria in their respective ways.

$$r_{ij} = (X_{ij} - X_{j\min}) / (X_{j\max} - X_{j\min}) \quad (2)$$

$$r_{ij} = (X_{j\max} - X_{ij}) / (X_{j\max} - X_{j\min}) \quad (3)$$

Step 3: Correlation calculation

In the third step, the relationship between the criteria was measured with the help of the standardized data. In order to perform this measurement, the relationship between the criteria was determined by calculating the correlation coefficients. This determination was made with the help of formula number 4.

$$\rho_{jk} = \frac{\sum_{i=1}^m (r_{ij} - \bar{r}_j)(r_{ik} - \bar{r}_k)}{\sqrt{\sum_{i=1}^m (r_{ij} - \bar{r}_j)^2 \sum_{i=1}^m (r_{ik} - \bar{r}_k)^2}} \quad (j, k = 1, 2, \dots, n) \quad (4)$$

Step 4: Calculating the amount of information

The amount of information will be determined in the fourth phase. However, the standard deviation needs to be measured before this computation can be carried out. Formula 5 illustrates how the standard deviation is calculated. The amount of information is measured following the standard deviation computation, and formula 6 displays this measurement.

$$\sigma_j = \sqrt{\frac{\sum_{i=1}^m (r_{ij} - \bar{r}_j)^2}{m}} \quad (5)$$

$$C_j = \sigma_j \sum_{k=1}^n (1 - \rho_{jk}) \quad j = 1, 2, \dots, n \quad (6)$$

Step 5: Weight calculation

The quantity of data determined in the preceding phase is crucial in the fifth and last step. This is due to the fact that the weights of the criteria are established and the quantity of information associated with each criterion is proportionate to the total amount of information. Weight is calculated using Formula 7. Upon completion of the computation, the total weights ought to equal one. Otherwise,

$$w_j = \frac{C_j}{\sum_{k=1}^n (C_k)} \quad (j = 1, 2, \dots, n) \quad (7)$$

3.3.2. Mairca Method

The phrase "Multi Attributive Ideal-Real Comparative Analysis" can be shortened to "Mairca method." Among the multi-criteria decision-making techniques used to compare alternatives is the Mairca method, one of the more recent approaches in the literature. Gigovic et al. (2016) presented the Mairca approach, a recently created technique, in the literature. The gap values of the criterion are actually attempted to be ascertained in this manner. The option with the lowest total gap value is chosen at the end of the process to determine which of the options is best (Gigovic et al., 2016; Pamucar et al., 2017).

The Mairca method consists of 7 steps (Pamucar et al., 2018):

Step 1: Creating a decision matrix

As in all methods, the first step in this method is to create a decision matrix, which is shown in matrix number 8.

$$X = \begin{bmatrix} x_{11} & x_{12} \cdots & x_{1n} \\ x_{21} & x_{22} \cdots & x_{2n} \\ \vdots & \vdots & \vdots \\ x_{m1} & x_{m2} \cdots & x_{mn} \end{bmatrix} \tag{8}$$

Step 2: Prioritize alternatives

The decision-maker determines which options should be prioritized. precedence is determined as a ratio of the number of possibilities, m, as there is no precedence among the options if the decision maker is neutral. Formula 9 displays this computation. Additionally, all priorities must add up to one.

$$PA_i = 1 / m \tag{9}$$

Step 3: Creating a theoretical rating matrix

This matrix is computed using weights and priority. Weights and priorities are multiplied to create the matrix, which has a single row if the priorities are equal. The theoretical rating matrix is Matrix 10.

$$\begin{matrix} w_1 & w_2 & \cdots & w_n \\ \begin{bmatrix} P_{A1} \cdot w_1 & P_{A1} \cdot w_2 & \cdots & P_{A1} \cdot w_n \\ P_{A2} \cdot w_1 & P_{A2} \cdot w_2 & \cdots & P_{A2} \cdot w_n \\ \vdots & \vdots & \ddots & \vdots \\ P_{Am} \cdot w_1 & P_{Am} \cdot w_2 & \cdots & P_{Am} \cdot w_n \end{bmatrix} \end{matrix} \tag{10}$$

Step 4: Creating the actual rating matrix

The fourth step is the creation of the actual rating matrix, which is another derivative of the normalization process found in other methods. At this stage, formula 11 is used for positive criteria and formula 12 for negative criteria and the new matrix is created.

$$t_{rij} = t_{pij} \cdot \left(\frac{x_{ij} - x_{ij}^-}{x_{ij}^+ - x_{ij}^-} \right) \tag{11}$$

$$t_{rij} = t_{pij} \cdot \left(\frac{x_{ij} - x_{ij}^+}{x_{ij}^- - x_{ij}^+} \right) \tag{12}$$

Step 5: Creating a total gap matrix

The fifth step involves creating a new matrix known as the total gap matrix by calculating the difference between the matrices used in steps three and four. Matrix 13 displays the total gap matrix, which is calculated by deducting the actual rating matrix from the theoretical rating matrix.

$$G = T_p - T_r = \begin{bmatrix} g_{11} & g_{12} & \cdots & g_{1n} \\ g_{21} & g_{22} & \cdots & g_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ g_{m1} & g_{m2} & \cdots & g_{mn} \end{bmatrix} \tag{13}$$

Step 6: Calculation of the final criterion functions of the alternatives (Qi)

The alternatives' total gap matrix serves as the foundation, and the rows of each option in the gap matrix are added together to determine the scores. It is demonstrated in formula number 14.

$$Q_i = \sum g_{ij} \quad (14)$$

Step 7: Identifying the best alternative

In the 7th and final step, ranking is done according to the Q_i scores determined by formula 14. The smallest final criterion is determined as the best alternative and ranking is done from smallest to largest.

3.4. Sample of the study

There are numerous businesses in the retail industry in Turkey. These businesses represent retail chains and stores across several industries. By examining various retail categories, the sample's companies seek to assess the retail industry's overall performance. Major brands like Artemis Halı, Bim Mağazalar, Bizim Mağazalar, Carrefoursa, Doğuş Otomotiv, Doğan Holding, Ebebek Mağazacılık, Gimat Mağazacılık, Kim Market Ersa Alışveriş, Metro Petrol ve Tesisleri, Migros Ticaret, Şok Marketler Ticaret, Suwen Tekstil, and Teknosa İç ve Dış Ticaret are among these companies. By examining these businesses, a robust data collection is produced that can be used to evaluate and better understand the sector's overall performance. The PDP provided the ten-year data for these businesses for the years 2014–2023.

Table 1. Sample of the Study

Artemis Carpet	Gimat Merchandising
Bim Stores	Kim Market Ersa Shopping
Bizim Stores	Metro Petroleum and Facilities
Carrefoursa	Migros Trade
Doğuş Otomotiv	SOK Markets Trade
Doğan Holding	Suwen Textile
Ebebek Retailing	Teknosa Domestic and Foreign Trade

3.5. Variables Used in the Research

The study assessed the financial performance of retail enterprises using a variety of financial ratios. In order to examine how companies perform in crucial areas including liquidity, financial structure, operating efficiency, and profitability, these ratios were chosen. The study's primary financial ratios include the following: return on assets (net profit divided by total assets), financial leverage ratio (total liabilities divided by total assets), asset turnover ratio (net sales divided by total assets), and current ratio (current assets divided by current liabilities). These ratios are the most often used metrics to assess a company's operational effectiveness and financial stability (Szymczyk et al., 2023).

Table 2. Variables used in the study

Variables	Financial Ratios	Formula
Current Ratio	Liquidity Ratios	Current Assets/ Short Term Liabilities
Financial Leverage Ratio	Financial Structure Ratios	Total Liabilities / Total Assets
Asset Turnover	Activity Ratios	Net Sales / Total Assets
Return on Assets	Profitability Ratios	Net Profit/Total Assets

4. Findings of the Study

In this section, the results and findings of CRITIC and MAIRCA methods are presented in the tables below.

Table 3. CRITIC Scores

Years	Active profitability	Current rate	Asset turnover	Financial leverage
2014	0.265572816	0.233252846	0.262810257	0.23836408
2015	0.089107916	0.114187078	0.505764876	0.29094013
2016	0.17497341	0.128155294	0.4198523	0.277018996
2017	0.120060478	0.103296356	0.400385236	0.37625793
2018	0.168297168	0.277234277	0.277234277	0.277234277
2019	0.165067611	0.278310796	0.278310796	0.278310796
2020	0.156116042	0.281294653	0.281294653	0.281294653
2021	0.155716199	0.281427934	0.281427934	0.281427934
2022	0.146244162	0.284585279	0.284585279	0.284585279
2023	0.152518419	0.28249386	0.28249386	0.28249386

The CRITIC scores in Table 3 provide data on important indicators that evaluate the financial performance of retail businesses over the years. These data cover four key financial ratios such as return on assets, current ratio, asset turnover and financial leverage ratios.

Return on Assets: Return on assets shows a certain fluctuation on an annual basis. In 2014, the highest return on assets value (0.2655) was achieved, whereas it started to decline in 2015 and generally fell to a level between 0.14-0.17 until 2022. By 2023, there was an increase again, but the value was still below the 2014 level. This shows that enterprises exhibit a fluctuating performance in terms of efficiency.

Current Ratio: The current ratio is an indicator of companies' capacity to pay their short-term debts and has generally followed an increasing trend since 2014. Especially after 2020, the current ratio value stabilized around 0.28. This may indicate that the liquidity level of companies has increased and their financial health has strengthened.

Asset Turnover: The change in asset turnover rate generally indicates how efficiently assets are used. In 2015, the highest asset turnover rate was reached with a high rate of 0.50, and then this rate decreased over the years to 0.28. This may indicate that companies are using their assets less efficiently and that there has been a decline in operational efficiency.

Financial Leverage: The financial leverage ratio shows the level of debt utilization of the enterprise. This ratio fluctuated from 0.24 in 2014 to 0.38 in 2017. However, since 2020, the financial leverage ratio has stabilized around 0.28 again. This may indicate that businesses keep their financial debt utilization under control and avoid excessive borrowing.

Table 4. MAIRCA Score and Ranking

COMPANIES	2014		2015		2016		2017	
	Qi	RANKING	Qi	RANKING	Qi	RANKING	Qi	RANKING
Bim Stores	0.010552	8	0.010981	9	0.01351	8	0.015449	6
Bizim Stores	0.015797	7	0.011082	8	0.013449	9	0.014063	7
Carrefoursa	0.026498	2	0.028657	3	0.031598	1	0.029072	3
Doğuş Otomotiv	0.018776	6	0.01824	5	0.021828	5	0.022201	5
Doğan Holding	0.025525	3	0.030812	2	0.03112	2	0.031248	1
Metro Petroleum and Facilities	0.030519	1	0.032038	1	0.0278	3	0.030951	2
Migros Trade	0.025112	4	0.026609	4	0.02652	4	0.02492	4
SOK	---	---	0.01786	7	0.018159	7	0.0126	8
Teknosa Domestic and Foreign Trade	0.021481	5	0.017922	6	0.021502	6	0.011537	9

Table 4 shows the MAIRCA scores and rankings of firms in the retail sector between 2014 and 2017.

Metro Petrol and Facilities and Carrefoursa performed strongly, generally ranking high. In particular, Metro Petrol ve Tesisleri ranked 1st in 2014 and 2015 and Carrefoursa ranked 1st in 2016.

Doğan Holding has consistently ranked 2nd and 3rd.

Bim Mağazalar and Bizim Mağazaları ranked between 6-9 respectively, lagging behind the strong players in the sector.

Şok Marketler ranked lower and there is no data for 2014.

In general, the leading firms in the sector performed strongly, while other firms ranked lower.

Table 5. MAIRCA Score and Ranking

COMPANIES	2018		2019		2020	
	Qi	RANKING	Qi	RANKING	Qi	RANKING
Artemis Carpet	---	---	---	---	0.027545147	2
Bim Stores	0.019642997	8	0.017988976	12	0.018863581	10
Bizim Stores	0.017196882	10	0.01476423	13	0.015954258	14
Carrefoursa	0.025199179	6	0.024970391	3	0.024685077	6
Doğuş Otomotiv	0.025545969	5	0.024074101	7	0.017041851	12
Doğan Holding	0.023267524	7	0.026135028	2	0.026485766	3
Ebebek Retailing	---	---	0.020661748	9	0.02223643	9
Gimat Merchandising	0.027368684	3	0.023626435	8	0.022653279	8
Kim Market Ersa Shopping	0.029470037	2	0.024776465	5	0.024822116	5
Metro Petroleum and Facilities	0.032341818	1	0.030288764	1	0.032431639	1
Migros Trade	0.026382331	4	0.024076542	6	0.023048232	7
Shock Markets Trade	0.019579386	9	0.020110033	10	0.018169275	11
Suwen Textile	---	---	0.024945136	4	0.025601792	4
Teknosa Domestic and Foreign Trade	0.017084502	11	0.019600178	11	0.016017838	13

Table 5 shows the MAIRCA scores and rankings of firms in the retail sector between 2018 and 2020.

Metro Petroleum and Facilities maintained its leading position in the sector by ranking 1st every year.

Kim Market Ersa Alışveriş rose to 2nd place in 2018, but fell to 5th place in the following years.

Carrefoursa and Doğan Holding ranked 3rd and 6th, respectively, and displayed a stable performance.

Migros Ticaret ranked 4th, while Gimat Mağazacılık ranked 3rd and 8th in 2018 and 2019.

Companies such as Bim Mağazalar, Doğuş Otomotiv and Şok Marketler Ticaret were ranked between 8-12, respectively, and their performances showed a relative decline.

Suwen Textile ranked 4th in 2020 and has been consistently ranked high.

In general, Metro Petrol and Tesisleri and Carrefoursa, the leading companies in the sector, displayed superior performance, while the rankings of other companies fluctuated over the years.

Table 6. MAIRCA Score And Ranking

COMPANIES	2021		2022		2023	
	Qi	RANKING	Qi	RANKING	Qi	RANKING
Artemis Carpet	0.029901344	2	0.028365672	3	0.029297901	2
Bim Stores	0.021287478	10	0.020847455	9	0.022950199	7
Bizim Stores	0.016210487	14	0.01332345	14	0.017825472	12
Carrefoursa	0.023546245	5	0.019705721	10	0.021787576	10
Doğuş Otomotiv	0.018941816	11	0.021073586	8	0.017130682	13
Doğan Holding	0.026947595	3	0.029253808	2	0.028887289	3
Ebebek Retailing	0.022410688	7	0.018515886	11	0.021926904	8
Gimat Merchandising	0.023264491	6	0.025374265	4	0.027163362	4
Kim Market Ersa Shopping	0.026494913	4	0.025284438	5	0.023919346	5
Metro Petroleum and Facilities	0.030786374	1	0.029694588	1	0.032679203	1
Migros Trade	0.022125262	8	0.021396124	7	0.0237237	6
Shock Markets Trade	0.01859011	12	0.018493894	12	0.021128767	11
Suwen Textile	0.022065422	9	0.022538685	6	0.021910897	9
Teknosa Domestic and Foreign Trade	0.018587884	13	0.013941474	13	0.013960895	14

Table 6 presents data showing MAIRCA scores and rankings for 2021-2023.

Metro Petroleum and Facilities maintained its leadership in the sector by ranking 1st every year from 2021 to 2023.

Artemis Hali has shown a consistently high performance by ranking 2nd.

Doğan Holding ranked 3rd in 2021 and 2022 and 3rd in 2023, becoming one of the important companies in the sector.

While Kim Market Ersan Shopping ranked 4th in 2021 and 2022, it dropped to 5th place in 2023.

Gimat Mağazacılık ranked between 4-6 every year and maintained its solid position in the sector.

Carrefoursa, Migros Ticaret and Ebebek Mağazacılık were ranked between 5-8 respectively, with small fluctuations in their performance.

Bim Mağazalar ranked 10th in 2021 and 7th in 2023.

While Doğu Otomotiv ranked 8th in 2022, it dropped to 13th in 2023.

Bizim Mağazaları and Teknosa İç ve Dış Ticaret remained at lower rankings and their performance declined between 2021 and 2023.

In general, Metro Petrol and Tesisleri maintained its leadership, while companies such as Artemis Hali and Doğan Holding ranked higher, while companies such as Bim Mağazalar and Migros Ticaret displayed a more stable performance, with some companies declining in the rankings over the years.

While the ranking results presented in the current study are meaningful in terms of revealing the relative performance levels of firms, explaining the reasons behind these rankings is critical to increase the analytical depth of the research. In this context, revealing the structural, financial and operational factors behind the ranking changes should be supported by qualitative analyses of firms' annual reports, financial statements and publicly available performance indicators. These documents are an important source of reference in explaining the reasons for the ranking results by providing information on many dynamics such as changes in income statement items, investment strategies, indebtedness structures, cost management policies, growth targets and responses to market conditions. This type of interpretive analysis not only identifies companies' performance levels, but also enhances the contextual accuracy of the findings and provides the research with valuable contributions to sectoral strategy development. Therefore, evaluating the ranking results within the framework of cause-and-effect relationships will strengthen the original contribution of the study and contribute to filling methodological gaps in the literature.

5. Conclusion

This study analyzed the financial performance of firms in the retail sector between 2014 and 2023 using CRITIC and MAIRCA methods to evaluate the performance of leading firms and laggard firms in the sector. The analyses conducted with both methods allowed us to determine the competitive position of firms in the sector by examining their financial health, liquidity, and operational efficiency on an annual basis.

CRITIC scores identify the highest- and lowest-performing firms in the sector with data calculated on the financial ratios of firms. Especially between 2014 and 2023, Metro Petrol and Facilities and Artemis Hali stood out as the leading companies in the sector. These companies maintained their strong financial performance in the sector with high rankings every year and gained an advantageous position compared to other companies. Metro Petrol and Facilities maintained its leadership every year, especially since 2014, demonstrating a strong performance in key indicators such as efficiency, liquidity, and financial leverage. Artemis Hali, on the other hand, has been on the rise, especially since 2020, and has consistently ranked 2nd in 2021-2023. This shows that the company has increased its competitiveness in the sector and maintained its solid stance in the financial structure.

Doğan Holding stands out as one of the strongest players in the sector, generally ranking between 2nd and 3rd between 2014 and 2023. This shows that the company has sustainable success in factors such as operational efficiency, return on assets, and financial leverage and maintains its solid position in the sector. Kim Market Ersa Alışveriş and Gimat Mağazacılık were among the companies that maintained their strong performance, ranking 4th and 8th, respectively, between 2018 and 2023. However, while Carrefoursa was the leader in the sector in 2014-2017, it lost its place in the sector by declining in the ranking in 2021-2023. This suggests that the company is in need of strategic changes and operational improvements.

Companies such as Bim Mağazalar and Bizim Mağazaları, on the other hand, have not been able to display a stable performance over the years and have experienced fluctuations in their rankings. Bim Mağazalar, in particular, ranked 10th in 2021 and 7th in 2023. This indicates that the company made strategic changes to improve financial efficiency. Bizim Mağazaları, on the other hand, generally ranked lower and struggled to improve its performance in the sector.

Şok Marketler and Teknosa İç ve Dış Ticaret have fallen in the rankings over the years and are among the laggards in the sector. In particular, companies such as Doğu Otomotiv and Teknosa İç ve Dış Ticaret experienced a significant decline in their rankings in 2023 and lost their positions in the sector.

In general, leading firms in the retail sector have consolidated their position in the sector and remained consistently highly ranked thanks to their strong financial structures, effective strategies, and operational efficiency. However, some firms, especially Bim Mağazalar and Bizim Mağazaları, have fluctuated in their performance over the years, indicating that they need to review their financial strategies. These firms may need to make fundamental changes in their financial structures and operational strategies in order to regain their competitive strength in the sector.

The findings of the study are consistent with similar studies in the literature and support the effects of the relevant financial ratios on sectoral performance. For example, the downward trend in asset turnover, which indicates the efficient utilization of assets, over the years is consistent with the fluctuations in operational efficiency observed by Şenkal & Öztel (2020) in the case of Carrefoursa. Similarly, the upward trend in current ratio values indicates that firms' capacity to meet their short-term liabilities has increased, which is in line with Pala's (2022) findings emphasizing the role of liquidity ratios in creating competitive advantage among firms in the retail sector. The stabilization of the financial leverage ratio over time indicates that firms have started to manage their borrowing structures in a more controlled manner and supports Kısakürek & Satır's (2020) findings on the risks of high borrowing on rates of return. In this framework, the ratios obtained with the CRITIC method used in this study not only reveal quantitative trends, but also provide empirical confirmation of the analysis in the existing literature. Therefore, the author's conclusions are both methodologically transparent and comparatively supported by previous studies.

In conclusion, the data provided by the MAIRCA and CRITIC methods provide a comprehensive analysis of firms' performance and financial health over the years, clearly identifying the leading and lagging firms in the sector. These results suggest that firms in the retail sector need to continuously improve their financial efficiency and operational strategies to increase their competitiveness and achieve sustainable success.

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