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Research Article

Evaluation of NBA Team Performances with TOPSIS and BORDA Counting Methods

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Abstract
In the National Basketball Association (NBA), offensive and defensive performances play a critical role in the success of teams and players. A team's collective performance is decisive on the road to championship. Team performance in the NBA is more important than individual talents. In this context, the regular season matches of all teams in the Eastern and Western conferences in the NBA in the 2023/2024 season were considered in the study. It is aimed at analyzing the one-season offensive and defensive performances of the teams in the Eastern and Western conferences of the NBA using Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) and BORDA counting methods, which are multi-criteria decision-making (MCDM) methods. In this direction, the teams that will continue with the Play-off and Play-in tournaments with their regular season performance were determined. As a result of the analysis, the participation status of the teams in the play-off and play-in tournaments was successfully ranked using regular season defensive and offensive performances with TOPSIS and BORDA counting methods. The final rankings provided a compelling insight into how well statistical methods can predict playoff participation at the end of the season.

Keywords: NBA, team performance, TOPSIS, BORDA counting
JEL Classification Codes: C00, C44

NBA Takım Performanslarının TOPSIS ve BORDA Sayım Yöntemleri ile Değerlendirilmesi

Öz
Ulusal Basketbol Birliği (NBA)'nde hücum ve savunma performansları, takımların ve oyuncuların başarısında kritik rol oynamaktadır. Bir takımın kolektif performansı şampiyonluk yolunda belirleyici olmaktadır. NBA'de takım performansı, bireysel yeteneklerin ötesinde bir öneme sahiptir. Bu bağlamda çalışmada NBA'de Doğu ve Batı konferanslarındaki tüm takımların 2023/2024 sezonunda normal sezonda oynanan maçlar göz önüne alınmıştır. NBA'de Doğu ve Batı konferanslarındaki takımların bir sezonluk hücum ve savunma performansları, çok kriterli karar verme (ÇKKV) yöntemlerinden İdeal Çözüme Benzerliğe Göre Sıra Tercihi Tekniği (TOPSIS) ve BORDA sayım yöntemleri kullanılarak analiz edilmesi amaçlanmıştır. Bu doğrultuda normal sezon performansı ile Play-off ve Play-in turnuvaları ile yoluna devam edecek takımlar belirlenmiştir. Yapılan analizler sonucunda TOPSIS ve BORDA sayım yöntemleri ile normal sezon savunma ve hücum performansları kullanılarak takımların Play-off ve Play-in turnuvalarına katılıp katılamama durumları başarılı bir şekilde sıralanmıştır. Elde edilen son sıralamalar, istatistiksel yöntemlerin sezon sonunda Play-off katılımını ne kadar iyi tahmin edebileceği konusunda ikna edici bir bakış açısı sunmuştur.

Anahtar kelimeler: NBA, takım performansı, TOPSIS, BORDA sayım
JEL Sınıflandırma Kodları: C00, C44

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1. Introduction

The NBA, one of the world's most popular professional basketball leagues, was founded in 1946 under the name BAA (Basketball Association of America). In its early years, the league had a more regional character, and viewership was low. By 1949, after strong competition between the BAA and the NBL (National Basketball League), the two leagues merged, laying the foundation for the NBA, which has grown in popularity day by day and become the most important basketball league in the world. The history of the NBA should not be considered merely the establishment of a team. The great struggles over the years, the emergence of star players, the game-enhancing changes in league rules, and the process of becoming a global phenomenon are all quite interesting. The legendary career of Michael Jordan in the 1990s and the emergence of new superstars such as Kobe Bryant and LeBron James in the 2000s are some of the important milestones that influenced the development of the NBA.

At its current stage, the NBA has transcended being merely a sports league, evolving into a cultural phenomenon. It has significant impacts on fashion, music, economy, and lifestyle. Moreover, the NBA can be described as a major industry. A prime example of this is its multifaceted influence on the global economy. As a substantial revenue source, the NBA generates billions of dollars from various avenues, including team ticket sales, sponsorship agreements, broadcasting rights, and merchandise sales. The revenues generated contribute significantly to the economies of the cities where the teams are based. This league provides job opportunities not only for athletes but also for coaches, managers, trainers, medical staff, and numerous other professionals. Furthermore, events and matches organized within the league generate temporary employment opportunities across various sectors. NBA games and associated events contribute to increased tourist influx into host cities, thereby enhancing the revenue streams of hotels, restaurants, and other tourism-related businesses. The brand value of NBA teams continues to strengthen, allowing corporations to secure substantial financial gains through sponsorship agreements while simultaneously enhancing the global image of the cities they represent. Economic developments within the NBA can also serve as valuable indicators of broader economic trends. For instance, a decline in ticket sales for an NBA team may be interpreted as a signal of economic downturn within the respective city. Beyond its economic influence, the NBA also exerts a significant social impact. High-profile athletes within the league frequently engage in advocacy on social issues, contributing to public awareness and fostering informed discussions on critical societal matters.

In a high-performance league like the NBA, statistics play a significant role. Examining and analyzing the performances of players and teams yields important results. In this context, statistics provide insights into the strengths and weaknesses of players and teams, team chemistry, and even the general state of the league. The

performances of players on their teams are a crucial variable in determining the value of their future contracts. Statistical data reveals which areas a team performs well or poorly in and which areas need improvement. Statistics demonstrate changes and developments in the flow of the game. Additionally, statistics help viewers better understand the game being played and follow the players more closely.

In the NBA, teams must demonstrate successful performance throughout the season to compete for the championship. The championship system consists of two stages: the regular season and the playoffs. The NBA comprises 30 teams, divided into the Eastern and Western Conferences. Each team plays 82 games during the regular season. Matches are played against teams within their own conference and teams from the other conference. At the end of the regular season, the top 8 teams from each conference qualify for the playoffs. Since the 2020-2021 season, a "play-in" tournament has been held between the teams finishing in 7th through 10th place in the standings. This tournament determines the final 2 teams to qualify for the playoffs. The playoffs begin with intra-conference matchups. In each round, a team must win 4 games to advance to the next round. Playoff matchups are seeded as 1-8, 2-7, 3-6, and 4-5. At the end of the conference playoffs, the champions of each conference are determined. The conference champions then face each other in the NBA Finals for the NBA championship. The NBA Finals are also played over 7 games, with the team winning 4 games becoming the champion. To win the NBA championship, a team must both succeed in the regular season and eliminate its opponents in the playoffs. The key here is for teams to finish in the top 10 of their respective conferences to continue their journey.

Considering literature, analyzing the offensive and defensive performances of teams from the NBA's Eastern and Western conferences during the regular season using MCDM methods can yield interesting and informative results. This kind of analysis can help us to understand the strengths and weaknesses of the teams based on numerical data and provide an opportunity to compare how different MCDM methods affect the results.

The objective of this study is determined as analyzing the offensive and defensive performances of all teams in the Eastern and Western conferences of the NBA during the regular season using multi-criteria decision-making methods. In this context, the study aims to reveal the one-season offensive and defensive performances of the NBA Eastern and Western Conference teams using MCDM methods. Firstly, both conferences will be held separately, and the teams will be ranked according to their offensive and defensive performances using the TOPSIS method. Then, the offensive and defensive rankings will be combined using the BORDA counting method to obtain the final ranking. In this direction, the teams that will continue with the play-off and play-in tournaments with their regular season performance will be determined. The defensive and offensive performances

of the teams and the results can be found with the MCDM method so that the rankings of the teams at the end of the year can be predicted correctly.

2. Literature Review

It is observed that various studies have been conducted on team performances in the NBA, which is increasing in popularity day by day. In this context, different studies have been carried out in many fields, such as health, economy, and sports. Yilmaz and Chatterjee (2000) researched the 50-year performances of NBA teams. Weiss and Sommers (2009) tested the hypothesis that potential negative intergroup effects arising from team diversity in terms of NBA team performances can be overcome by the necessary cooperation inherent in team sports. Price et al. (2010) analyzed NBA matches between 1977 and 2007 in their study, examining conscious match losses to take advantage of the incentive to be the last. Ertug and Castellucci (2013) conducted their analyses on a sample of NBA teams and players to examine the relationship between reputation and pay. Martinez and Caudill (2013) aimed to determine whether there is an effect of mid-season coach changes on the performance of NBA teams. Juravich et al. (2017) examined 17 seasons of data on NBA team performance and general manager characteristics in their study, estimating two-stage panel regression models to investigate the relationship between them. Nutting and Price (2017) examined the relationship between the times of NBA team matches and their probability of winning. Harris and Roebber (2019) investigated 32 seasons of team performance data using artificial neural networks to examine the home advantage of NBA teams. Ulaş (2021) utilized machine learning techniques along with ordinary least squares (OLS), fixed effects, and random effects models in statistical analyses to determine the factors affecting NBA team values. Nguyen et al. (2022) used machine learning and deep learning methods to determine players selected for the NBA All-Star game. Horvat et al. (2023) proposed a data-driven model using team performance indicators to predict NBA match results in their study. Sarlis et al. (2024) examined sports analytics by focusing on injury models of players in the NBA and their effects on player performance. Yeung (2025) aimed to predict NBA playoff qualifications using machine learning methods.

Many studies on NBA and other sports datasets have been reviewed, and it has been observed that MCDM methods have been utilized. Dadelo et al. (2014) used the TOPSIS method to help optimize the training process by promoting more efficient player and team rating, more accurate predictions of sports results, team formation, and the individuality and versatility of team players, i.e., compliance with the team's general physical readiness norms. Dong et al. (2015, October) ranked the ability of NBA teams with the BORDA counting method and the weighted BORDA counting method. Blanco et al. (2018) proposed a multi-criteria selection system to rank player efficiencies. Kizielewicz and Dobryakova (2020) used the COMET technique, one of the MCDM methods, for the evaluation of selected basketball

players from the NBA in their study and achieved successful results. Pradhan and Abdourazakou (2020) used MCDM methods for performance evaluation and ranking frameworks related to eSports. Pradhan and Chachad (2021) used the grey relational analysis MCDM method to investigate the efficiencies of NBA players. Özkir and Değirmenci (2023) proposed a fuzzy decision-making approach to examine the performances of players playing in the NBA and determine the league's MVP. Xu et al. (2024) used Entropy and TOPSIS MCDM methods to comprehensively evaluate the progress of competitive sports development in provinces and cities in China.

In addition, performance studies have been conducted in the NBA using different methods. NBA match results have been predicted using machine learning methods and hybrid methods (Thabtah et al., 2019; Ouyang et al., 2024; Abdi et al., 2025; Liu and Guo, 2025). Studies on athlete performances have been conducted using similar methods (Depren, 2019; Ji, 2020; Çene et al., 2024).

3. Research Methodology

3.1. Data Set

In line with the study's objective, the performance variables of NBA teams will be included in the study to examine the teams' standings. In this context, a detailed literature review was conducted to enable the study, and the variables and methods used were determined. The dataset in the study relates to the 82 matches played in the 2023/2024 season's regular season and was created in 2 sections with the help of data obtained from the Basketball Reference (Basketball Reference web page), HoopsHype (HoopsHype web page) and Spotrac (Spotrac web page) websites. The first is the offensive performance of the teams, and the second is the defensive performance of the teams. These variables are given in Table 1.

Table 1. Variable Codes, Names and Properties of NBA Teams Used in the Study

Variable code	Variable name	Property
FG (%)	*Average field goal percentage per game*	*Offense Variables*
FT (%)	*Average free throw percentage per game*	
ORB	*Average offensive rebounds per game*	
DRB	*Average defensive rebounds per game*	
AST	*Average assists per game*	
STL	*Average steals per game*	
BLK	*Average blocks per game*	
TOV	*Average turnovers per game*	
PF	*Average fouls per game*	
PTS	*Average points scored per game*	
FG (%)	*Opponent's average field goal percentage per game*	*Defense Variables*
FT (%)	*Opponent's average free throw percentage per game*	
ORB	*Opponent's average offensive rebounds per game*	

DRB	*Opponent's average defensive rebounds per game*
AST	*Opponent's average assists per game*
STL	*Opponent's average steals per game*
BLK	*Opponent's average blocks per game*
TOV	*Opponent's average turnovers per game*
PF	*Opponent's average fouls per game*
PTS	*Opponent's average points scored per game*

3.2. Methods

To examine the offensive and defensive performances of NBA Eastern and Western Conference teams in this study, MCDM methods will be utilized within the framework of the study's objective and literature. MCDM is the process of determining the best option by considering multiple criteria. In today's increasingly complex decision-making processes, MCDM methods come into play when a single criterion is insufficient. These methods help to make more rational and consistent decisions by considering the importance levels of different criteria. MCDM methods are used in many fields such as business, engineering, sports, environment, public, tourism, economy, and health (Bozbura et al., 2008; Zavadskas and Turskis, 2011; Liu et al., 2012; Liu et al., 2019; Özkir and Değirmenci, 2023; Fisher and Montague, 2024).

3.2.1. TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) MCDM Method

TOPSIS, an MCDM method, is known as Technique for Order Preference by Similarity to Ideal Solution. The TOPSIS method was introduced by Hwang and Yoon (1981). The purpose of this method is to determine the proximity of a selected alternative to the ideal solution and its distance from the non-ideal solution according to the criteria. Six steps are used to reach a solution in the TOPSIS method.

Step 1: Creation of the decision matrix. The decision matrix $D = [d_{ij}]_{m*k}$ is determined by the decision maker.

Step 2: A normalized decision matrix is constructed as in equation 1 (r_{ij});

$$r_{ij} = \frac{d_{ij}}{\sum_{i=1}^{m} d_{ij}^2} \tag{1}$$

Step 3: The weighted normalized decision matrix is calculated as in equation 2. (v_{ij}).

$$v_{ij} = w_i r_{ij} \tag{2}$$

Where w_i, is the weight of the i. attribute or criterion and $\sum_{i=1}^{n} w_i = 1$.

Step 4: Ideal and non-ideal solutions are determined as in equations 3 and 4.

$$A^+ = \{v_1{}^+, v_2{}^+, \dots, v_n{}^+\} = \{(\max v_{ij} \,|i \in I'), (\min v_{ij} \,|i \in I'')\} \quad (3)$$

$$A^- = \{v_1{}^-, v_2{}^-, \dots, v_n{}^-\} = \{(\min v_{ij} \,|i \in I'), (\max v_{ij} \,|i \in I'')\} \quad (4)$$

Here I' is the benefit criterion and I'' is the cost criterion.

Step 5: Ideal and non-ideal solution metrics are calculated as in equations 5 and 6.

$$S_i{}^+ = \sqrt{\sum_{j=1}^{k} (v_{ij} - v_j{}^+)^2} \quad (5)$$

$$S_i{}^- = \sqrt{\sum_{j=1}^{k} (v_{ij} - v_j{}^-)^2} \quad (6)$$

Step 6: The relative closeness to the ideal solution is determined as in equation 7.

$$C_i{}^+ = \frac{S_i{}^-}{(S_i{}^- + S_i{}^+)} \quad (7)$$

Where $C_i{}^+$ takes values in the range $0 \leq C_i{}^+ \leq 1$ (Hwang ve Yoon, 1981; Opricovic ve Tzeng, 2004; Temizel ve Bayçelebi, 2016; Akoğul vd., 2020).

3.2.2. BORDA Counting Method

The BORDA counting method, which was developed as a counting method within MCDM methods, was introduced by Jean-Charles de Borda (1784). The primary purpose of this method is to rank existing alternatives. The highest score is assigned to the alternative with the highest ranking, and this continues until the lowest ranking is given a value of 0 or 1. The idea of the BORDA counting method requires voters to rank each candidate and assign a value to each candidate. (Bouyssou et al., 2006; Çakir and Perçin, 2013; Terzopoulou and Endriss, 2021; Sonatha et al., 2021). The BORDA score is obtained with the following equation 8.

$$B(i) = \sum_{k=1}^{K} B_k^i \quad (8)$$

Here, B_k^i, is the BORDA score of class i, expressed by the k. decision maker, which determines the rank of class i.

3.3. Application

In this study, focusing on the offensive and defensive performances of the NBA Eastern and Western Conference teams, it will be conducted within the framework of the literature review and the study's objective. In this direction, the TOPSIS and BORDA counting methods will be utilized based on team performances for the conference rankings of NBA teams. In this context, the study is structured in two stages:

Stage 1: Using the TOPSIS method, the NBA Eastern and Western Conference teams in the dataset will be ranked separately according to their offensive and defensive performances within their respective conferences.

Stage 2: The offensive and defensive rankings obtained from the TOPSIS method will be combined using the BORDA counting method to obtain the final rankings for each conference.

The framework of the application is given in chart 1;

Step 1. NBA Eastern and Western Conference teams in the dataset will be ranked	>TOPSIS>	Step 2. The offensive and defensive rankings obtained from the TOPSIS	>BORDA>	the final rankings for each conference.

Chart 1. Steps of the application

In this study, the dataset was transferred to Microsoft Office Excel. Analyses will be obtained with the help of this program.

4. Findings

In this study, focusing on the offensive and defensive performances of the NBA Eastern and Western Conference teams, it was conducted within the framework of the literature review and the study's objective. In this direction, the TOPSIS and BORDA counting methods were utilized based on team performances for the conference rankings of NBA teams.

In accordance with the first stage of the application, the NBA Eastern and Western Conference teams in the dataset were ranked separately according to their offensive

and defensive performances within their respective conferences using the TOPSIS method. Table 2 shows the decision matrix for the offensive performance dataset of the NBA Eastern teams.

Table 2. Decision Matrix for the Offensive Performance Data Set of the NBA Eastern Teams

Teams	FG% (+)	FT% (+)	ORB (+)	DRB (+)	AST (+)	STL (+)	BLK (+)	PTS (+)	TOV (-)	PF (-)
Boston Celtics	0,487	0,807	10,7	35,6	26,9	6,8	6,6	120,6	11,9	16,2
New York Knicks	0,465	0,780	12,7	32,5	24,4	7,5	4,1	112,8	13,2	17,6
Milwaukee Bucks	0,487	0,774	9,4	34,8	26,5	6,8	5,0	119,0	12,9	19,2
Cleveland Cavaliers	0,479	0,765	9,8	33,4	28,0	7,4	4,6	112,6	13,6	17,5
Orlando Magic	0,476	0,759	10,5	31,8	24,7	8,2	5,2	110,5	14,7	19,7
Indiana Pacers	0,507	0,782	10,1	31,4	30,8	7,7	5,9	123,3	12,9	21,4
Philadelphia 76ers	0,464	0,826	11	31,9	24,9	8,5	6,0	114,6	12,0	20,3
Miami Heat	0,465	0,818	9,3	33,0	25,8	7,5	3,4	110,1	12,7	17,3
Chicago Bulls	0,470	0,791	11,2	32,6	25,0	7,8	4,8	112,3	12,2	18,8
Atlanta Hawks	0,465	0,797	12,5	32,2	26,6	7,5	4,5	118,3	13,5	18,6
Brooklyn Nets	0,456	0,756	11,4	32,6	25,6	6,8	5,2	110,4	13,1	18,5
Toronto Raptors	0,471	0,756	10,9	31,6	28,5	7,7	4,7	112,4	14,0	18,4
Charlotte Hornets	0,460	0,786	9,3	31,0	24,8	6,9	4,5	106,6	13,8	18,0
Washington Wizards	0,470	0,764	9,2	31,9	27,9	7,6	5,1	113,7	14,0	20,0
Detroit Pistons	0,463	0,785	10,5	32,8	25,5	6,5	4,7	109,9	15,2	20,6

Based on the decision matrix given in Table 2, the normalized decision matrix, the weighted normalized decision matrix, and the ideal and non-ideal solutions were determined and calculated, and the offensive rankings for the NBA Eastern teams using the TOPSIS method are given in Table 3.

Table 3. Offensive Rankings for the NBA Eastern Teams Using the TOPSIS Method

Teams	Si+	Si-	Ci	Ranking
Boston Celtics	0,3027	0,8536	0,7382	1
New York Knicks	0,7021	0,4380	0,3842	8
Milwaukee Bucks	0,4334	0,6985	0,6171	3
Cleveland Cavaliers	0,6485	0,4404	0,4045	6
Orlando Magic	0,8270	0,2577	0,2376	13
Indiana Pacers	0,3852	0,9551	0,7126	2
Philadelphia 76ers	0,6444	0,4800	0,4269	5
Miami Heat	0,8071	0,3352	0,2934	11
Chicago Bulls	0,7122	0,3881	0,3527	10
Atlanta Hawks	0,4479	0,6622	0,5966	4
Brooklyn Nets	0,7822	0,3192	0,2898	12
Toronto Raptors	0,6701	0,4163	0,3832	9
Charlotte Hornets	0,9966	0,2063	0,1715	15
Washington Wizards	0,6517	0,4231	0,3937	7
Detroit Pistons	0,8528	0,2152	0,2015	14

Table 4 shows the decision matrix for the defensive performance dataset of the NBA Eastern teams.

Table 4. Decision Matrix for the Defensive Performance Data Set of the NBA Eastern Teams

Teams	FG% (-)	FT% (-)	ORB (-)	DRB (-)	AST (-)	STL (-)	BLK (-)	PTS (-)	TOV (+)	PF (+)
Boston Celtics	0,453	0,768	11,1	32,3	24,9	6,2	3,7	109,2	12,0	17,3
New York Knicks	0,470	0,764	10,2	30,4	25,6	6,7	5,3	108,2	13,2	19,1
Milwaukee Bucks	0,470	0,807	10,3	33,7	26,5	7,1	4,2	116,4	12,0	19,2
Cleveland Cavaliers	0,463	0,791	10,0	32,6	25,3	7,7	5,0	110,2	13,6	18,7
Orlando Magic	0,474	0,780	8,9	30,9	23,9	8,1	4,6	108,4	15,0	20,9
Indiana Pacers	0,496	0,787	11,0	32,4	24,6	6,6	5,4	120,2	13,9	18,3
Philadelphia 76ers	0,468	0,791	11,0	33,4	26,1	6,2	6,1	111,5	14,6	18,5
Miami Heat	0,467	0,780	9,2	33,5	26,5	6,6	4,7	108,4	13,7	18,9
Chicago Bulls	0,473	0,776	10,1	33,3	27,9	6,8	4,9	113,7	14,0	18,8
Atlanta Hawks	0,495	0,792	10,6	33,6	28,2	7,8	5,6	120,5	14,1	19,4
Brooklyn Nets	0,470	0,807	10,3	34,0	25,5	6,9	5,0	113,3	12,6	18,2
Toronto Raptors	0,491	0,789	11,2	34,0	28,6	7,3	5,8	118,8	13,6	18,7
Charlotte Hornets	0,494	0,796	10,6	34,8	28,7	7,1	4,8	116,8	13,6	17,5
Washington Wizards	0,496	0,777	12,1	36,8	29,0	8,0	6,0	123,0	14,0	18,0
Detroit Pistons	0,490	0,800	9,6	33,5	27,0	8,9	6,0	119,0	12,4	17,8

Based on the decision matrix given in Table 4, the normalized decision matrix, the weighted normalized decision matrix, and the ideal and non-ideal solutions were determined and calculated, and the defensive performance rankings for the NBA Eastern teams using the TOPSIS method are given in Table 5.

Table 5. Defensive Rankings for the NBA Eastern Teams Using the TOPSIS Method

Teams	Si+	Si-	Ci	Ranking
Boston Celtics	0,2920	0,8145	0,7361	5
New York Knicks	0,1883	0,8817	0,8240	2
Milwaukee Bucks	0,5047	0,4613	0,4775	9
Cleveland Cavaliers	0,2397	0,7578	0,7597	4
Orlando Magic	0,1070	0,9167	0,8955	1
Indiana Pacers	0,6576	0,4058	0,3816	11
Philadelphia 76ers	0,3196	0,6881	0,6828	6
Miami Heat	0,2436	0,8297	0,7730	3
Chicago Bulls	0,3994	0,5758	0,5904	8
Atlanta Hawks	0,7103	0,2930	0,2921	14
Brooklyn Nets	0,3860	0,5947	0,6064	7
Toronto Raptors	0,6555	0,3147	0,3243	13
Charlotte Hornets	0,5906	0,3920	0,3989	10
Washington Wizards	0,9218	0,1184	0,1138	15
Detroit Pistons	0,6582	0,3327	0,3357	12

Table 6 shows the final rankings of NBA Eastern teams using the BORDA counting method.

Table 6. Final Rankings for NBA Eastern Teams by BORDA Counting Method

Teams	Offensive ranking	Defensive ranking	BORDA counting	Final Ranking	Real Ranking
Boston Celtics	**1**	**5**	**24**	**1**	**1**
New York Knicks	**8**	**2**	**20**	**2**	**2**
Milwaukee Bucks	**3**	**9**	**18**	**5**	**3**
Cleveland Cavaliers	**6**	**4**	**20**	**2**	**4**
Orlando Magic	**13**	**1**	**16**	**7**	**5**
Indiana Pacers	**2**	**11**	**17**	**6**	**6**
Philadelphia 76ers	**5**	**6**	**19**	**4**	**7**
Miami Heat	**11**	**3**	**16**	**7**	**8**
Chicago Bulls	**10**	**8**	**12**	**9**	**9**
Atlanta Hawks	**4**	**14**	**12**	**9**	**10**
Brooklyn Nets	12	7	11	11	11
Toronto Raptors	9	13	8	12	12
Charlotte Hornets	15	10	5	14	13
Washington Wizards	7	15	8	12	14
Detroit Pistons	14	12	4	15	15

Between Table 2 and Table 6, the rankings of NBA Eastern teams were found with the help of their offensive and defensive performances. It is seen that the final rankings obtained because of the analysis are consistent with the actual rankings of the top 10 teams.

Table 7 shows the decision matrix for the offensive performance dataset of NBA Western teams.

Table 7. Decision Matrix for the Offensive Performance Data Set of the NBA Western Teams

Teams	FG% (+)	FT% (+)	ORB (+)	DRB (+)	AST (+)	STL (+)	BLK (+)	PTS (+)	TOV (-)	PF (-)
Oklahoma City Thunder	0,499	0,825	8,8	33,2	27,1	8,5	6,6	120,1	12,7	18,8
Denver Nuggets	0,496	0,762	10,7	33,7	29,5	7,1	5,6	114,9	12,6	18,2
Minnesota Timberwolves	0,485	0,777	9,4	34,2	26,6	7,9	6,1	113	14,2	18,8
Los Angeles Clippers	0,489	0,825	10	32,9	25,6	7,8	5	115,6	13,1	18,5
Dallas Mavericks	0,481	0,758	9,7	33,2	25,7	6,9	5	117,9	12,5	18,3
Phoenix Suns	0,493	0,808	10,1	33,9	27	7,4	6	116,2	14,9	18
Los Angeles Lakers	0,499	0,782	8,2	34,9	28,5	7,4	5,5	118	14	15,6
New Orleans Pelicans	0,486	0,771	10,4	33,6	27	8,3	4,6	115,1	13	18,4
Sacramento Kings	0,477	0,745	10,8	33,2	28,3	7,6	4,2	116,6	13,1	19,9
Golden State Warriors	0,477	0,78	12,1	34,6	29,3	7	4,6	117,8	14,3	19,5
Houston Rockets	0,459	0,773	11,5	34	24,8	7,8	4,6	114,3	12,7	20,8
Utah Jazz	0,467	0,83	12,2	33,2	27,2	6,5	5,6	115,7	15,7	18,6
Memphis Grizzlies	0,435	0,764	10,9	31,7	24,7	8,2	6,1	105,8	15,1	19,1
San Antonio Spurs	0,462	0,782	10,4	33,9	29,9	7,1	6,3	112,1	15,1	17,2
Portland Trail Blazers	0,439	0,791	12,6	30,1	23,1	7,6	4,3	106,4	15,2	20,2

Based on the decision matrix given in Table 7, the normalized decision matrix, the weighted normalized decision matrix, and the ideal and non-ideal solutions were determined and calculated, and the offensive performance rankings for NBA Western teams using the TOPSIS method are given in Table 8.

Table 8. Offensive Rankings for the NBA Western Teams Using the TOPSIS Method

Teams	Si+	Si-	Ci	Ranking
Oklahoma City Thunder	0,3063	0,8076	0,7250	3
Denver Nuggets	0,3400	0,6355	0,6514	5
Minnesota Timberwolves	0,4834	0,4796	0,4981	13
Los Angeles Clippers	0,4116	0,5633	0,5778	10
Dallas Mavericks	0,3571	0,6791	0,6553	4
Phoenix Suns	0,3493	0,6178	0,6388	7
Los Angeles Lakers	0,2857	0,7678	0,7288	1
New Orleans Pelicans	0,3800	0,5784	0,6035	9
Sacramento Kings	0,3527	0,6479	0,6475	6
Golden State Warriors	0,2811	0,7492	0,7271	2
Houston Rockets	0,5026	0,5246	0,5107	12
Utah Jazz	0,3832	0,6032	0,6115	8
Memphis Grizzlies	0,8284	0,2303	0,2175	14
San Antonio Spurs	0,4710	0,5552	0,5411	11
Portland Trail Blazers	0,8675	0,2354	0,2135	15

Table 9 shows the decision matrix for the defensive performance dataset of the NBA Eastern teams.

Table 9. Decision Matrix for the Defensive Performance Data Set of the NBA Western Teams

Teams	FG% (-)	FT% (-)	ORB (-)	DRB(-)	AST (-)	STL (-)	BLK (-)	PTS (-)	TOV (+)	PF (+)
Oklahoma City Thunder	0,455	0,789	11,8	32,9	26,9	7,1	5,1	112,7	15,7	18,9
Denver Nuggets	0,462	0,772	10,9	31,4	25,7	7	4,8	109,6	12,4	17,9
Minnesota Timberwolves	0,45	0,781	10,3	31,2	24,5	7,5	4,5	106,5	14,2	19,9
Los Angeles Clippers	0,468	0,775	11,1	31,1	26,4	7,3	4,7	112,3	13	18,7
Dallas Mavericks	0,475	0,77	10,9	34,1	27,5	7,4	4	115,6	13,7	20,3
Phoenix Suns	0,464	0,774	11	30,4	26,3	8,4	4,5	113,2	12,7	19,7
Los Angeles Lakers	0,474	0,795	10,9	33,2	28,2	8,2	4,8	117,4	13,4	19,7
New Orleans Pelicans	0,464	0,783	10,1	32,2	26,8	6,5	5,2	110,7	14,2	18,4
Sacramento Kings	0,48	0,8	9,1	33,4	26,9	7,4	4,5	114,8	13,9	18,3
Golden State Warriors	0,466	0,788	10,9	32	26,7	7,7	5	115,2	13	17,9
Houston Rockets	0,463	0,767	10,7	34,2	24,4	7,3	5,9	113,2	13,8	19,6
Utah Jazz	0,487	0,771	11	31,3	29,8	8,6	6,4	120,5	12,3	19,2
Memphis Grizzlies	0,474	0,779	10,7	35	26,6	8,1	6,5	112,8	15,1	18,8
San Antonio Spurs	0,487	0,784	10,5	34,8	28	8,9	4,6	118,6	13,4	17,9
Portland Trail Blazers	0,491	0,792	10,6	33,2	27,1	8,9	6,4	115,4	14,3	17,9

Based on the decision matrix given in Table 9, the normalized decision matrix, the weighted normalized decision matrix, and the ideal and non-ideal solutions were

determined and calculated, and the defensive performance rankings for NBA Western teams using the TOPSIS method are given in Table 10.

Table 10. Defensive Rankings for the NBA Western Teams Using the TOPSIS Method

Teams	Si+	Si-	Ci	Ranking
Oklahoma City Thunder	0,3912	0,5079	0,5649	5
Denver Nuggets	0,2913	0,6544	0,6920	2
Minnesota Timberwolves	0,1221	0,8238	0,8709	1
Los Angeles Clippers	0,3657	0,5329	0,5930	4
Dallas Mavericks	0,5392	0,3657	0,4041	11
Phoenix Suns	0,4055	0,5150	0,5595	6
Los Angeles Lakers	0,6286	0,2643	0,2960	13
New Orleans Pelicans	0,2950	0,5923	0,6675	3
Sacramento Kings	0,4844	0,4106	0,4588	9
Golden State Warriors	0,5097	0,3860	0,4310	10
Houston Rockets	0,4211	0,5061	0,5458	7
Utah Jazz	0,8189	0,2100	0,2041	15
Memphis Grizzlies	0,4501	0,4737	0,5128	8
San Antonio Spurs	0,7189	0,1988	0,2166	14
Portland Trail Blazers	0,5435	0,3462	0,3891	12

Table 11 shows the final rankings of NBA Western teams using the BORDA counting method.

Tablo 11. Final Rankings for NBA Western Teams by BORDA Counting Method

Teams	Offensive ranking	Defensive ranking	BORDA counting	Final Ranking	Real Ranking
Oklahoma City Thunder	**3**	**5**	**22**	**2**	**1**
Denver Nuggets	**5**	**2**	**23**	**1**	**2**
Minnesota Timberwolves	**13**	**1**	**16**	**6**	**3**
Los Angeles Clippers	**10**	**4**	**16**	**6**	**4**
Dallas Mavericks	**4**	**11**	**15**	**9**	**5**
Phoenix Suns	**7**	**6**	**17**	**5**	**6**
Los Angeles Lakers	**1**	**13**	**16**	**6**	**7**
New Orleans Pelicans	**9**	**3**	**18**	**3**	**8**
Sacramento Kings	**6**	**9**	**15**	**9**	**9**
Golden State Warriors	**2**	**10**	**18**	**3**	**10**
Houston Rockets	12	7	11	11	11
Utah Jazz	8	15	7	13	12
Memphis Grizzlies	14	8	8	12	13
San Antonio Spurs	11	14	5	14	14
Portland Trail Blazers	15	12	3	15	15

Between Table 7 and Table 11, the rankings of NBA Western teams were found with the help of their offensive and defensive performances. It is seen that the final rankings obtained because of the analysis are consistent with the actual rankings of the top 10 teams.

5. Results and Discussion

In this study, focusing on the offensive and defensive performances of the NBA Eastern and Western Conference teams, it was conducted within the framework of the literature review and the study's objective. In this context, the TOPSIS and BORDA counting methods were utilized based on team performances for the conference rankings of NBA teams, and significant results were obtained. It is possible to mention the success of the analyses made in line with the application section structured in two stages.

The NBA play-off and play-in system is an elimination tournament where the teams that finish the regular season with the best degrees compete for the championship. With the NBA play-off and play-in system, after the regular season, the teams in the Western and Eastern conferences are ranked in their respective conferences, and the teams that will continue are determined. Considering the first step of the study, the rankings of both the Eastern and Western conference teams were obtained with the help of their performances using TOPSIS.

In the NBA, both offensive and defensive performances are of paramount importance for individual players and teams, forming the foundation of the league's competitive structure. Players who exhibit exceptional performance attain "star" status, which not only enhances their popularity but also secures lucrative sponsorship agreements and high salaries. Moreover, these players significantly contribute to their team's visibility and marketability. Star athletes play a crucial role in their team's success, often delivering decisive performances that influence game outcomes. The offensive and defensive capabilities of teams directly impact their reputation and overall valuation within the league. Achieving success and securing championships constitute the primary objectives of all NBA teams, with overall team performance serving as the most critical determinant in attaining these goals. Teams that excel during the regular season earn qualification for the play-offs or the play-in tournament, thereby increasing their prospects of championship contention. Participation in the play-offs not only enhances a team's visibility and brand value but also strengthens its fan base and commercial appeal, leading to greater sponsorship opportunities. Furthermore, a team's economic success is closely tied to its on-court performance. Strong team cohesion plays a vital role in ensuring optimal performance, as individual contributions must align with the team's strategic playing style to maximize effectiveness and competitive advantage.

Coaches' best management of player performances and implementation of correct strategies increase the overall performance of the team. Players' endurance, speed, strength, and agility directly affect their performance. Basic basketball skills such as shooting, passing, dribbling, and defense play a decisive role in the performance of teams. Players' self-confidence, motivation, and ability to focus on matches affect the performance of teams. Coaches' correct guidance of players and implementation of effective tactics increase the team's performance. In this context,

the final rankings obtained in line with the objectives of the study have shown the playoff potential of the top 10 teams in each conference. The results of the study revealed that the determined rankings are largely consistent with the rankings of the teams that qualified for the playoffs. These results show that MCDM methods can be used as an effective tool in sports analytics and performance evaluation processes.

According to the findings, the final rankings derived from the analysis are consistent with the actual rankings of the top 10 teams. This consistency highlights the efficacy of applying MCDM methods in sports analytics and performance evaluation. Specifically, the TOPSIS and BORDA counting methods effectively rank NBA teams based on their offensive and defensive performances. It is discussed that there are similarities and differences with some studies in the literature in terms of the data set, methodology, and results of the study. In this context, similar to the results of the study, successful results were obtained with linear regression for the performance rankings of athletes with the help of data used in team performance (Mertz et al., 2016). In addition, data sets similar to the data used in this study have been used to examine team achievements (Vaz de Melo et al., 2008). Unlike this study, some studies have used methods such as data envelopment analysis and Bayesian linear regression to analyze team performances (Deshpande and Jensen, 2016; Yang et al., 2021).

There are some limitations in this study. The teams in the NBA Eastern and Western conferences were examined separately. The 82 matches played in the 2023/2024 regular season were taken as a basis. In this context, the rankings of the teams were obtained using the TOPSIS and BORDA counting methods in the study.

References

Abdi, M., Kargari, M., Alavi, M., & Teimourpour, B. (2025, February). Predicting NBA Playoffs Qualification Using Machine Learning Techniques. In *2025 29th International Computer Conference, Computer Society of Iran (CSICC)* (pp. 1-5). IEEE.

Akoğul, S., Erisoglu, M., & Erişoğlu, Ü. (2020). Determining the Number of Clusters with the TOPSIS Method in Clustering Based on the Multivariate Mixtures of Normal Distributions. *Erciyes University Institute of Science Journal of Science, 36*(3), 472-480.

Basketball Reference web page, https://www.basketball-reference.com/, Access Date: 17.12.2024

Blanco, V., Salmerón, R., & Gómez-Haro, S. (2018). A multicriteria selection system based on player performance: Case study—the spanish acb basketball league. *Group Decision and Negotiation*, 27, 1029-1046.

Borda, J. C. (1784). Mémoire sur les élections au scrutin, Histoire de l'Académie royale des sciences pour 1781. *Paris (English Transl. by Grazia, A. 1953. Isis 44)*.

Bouyssou, D., Marchant, T., Pirlot, M., Tsoukias, A., & Vincke, P. (2006). *Evaluation and decision models with multiple criteria: Stepping stones for the analyst* (Vol. 86). Springer Science & Business Media.

Bozbura, F. T., Beşkese, A., & Kaya, T. S. (2008). Topsis Method on Player Selection in Mba. In *2008 Proceedings of the Twelfth International Research/Expert Conference, Trends in the Development of Machinery and Associated Technology* (pp. 401-404).

Çakir, S., & Perçin, S. (2013). Performance measurement of logistics firms with multi-criteria decision making methods. *Ege Academic Review, 13*(4), 449.

Çene, E., Özdalyan, F., Parim, C., Mancı, E., & İnan, T. (2024). How do European and non-European players differ: Evidence from EuroLeague basketball with multivariate statistical analysis. *Proceedings of the Institution of Mechanical Engineers, Part P: Journal of Sports Engineering and Technology*, 17543371241242835.

Dadelo, S., Turskis, Z., Zavadskas, E. K., & Dadeliene, R. (2014). Multi-criteria assessment and ranking system of sport team formation based on objective-measured values of criteria set. *Expert Systems with Applications, 41*(14), 6106-6113.

Depren, S. K. (2019). The Effectiveness of Different Machine Learning Algorithms on Basketball Players'shooting Performance. *Ondokuz Mayıs University Journal of Sports and Performance Researches*, *10*(3), 256-269.

Deshpande, S. K., & Jensen, S. T. (2016). Estimating an NBA player's impact on his team's chances of winning. *Journal of Quantitative Analysis in Sports*, *12*(2), 51-72.

Dong, Y., Xie, C., & Wang, C. (2015, October). Application of Fuzzy Decision-Making Methods in the NBA Team Ranking. In *2015 3rd International Conference on Mechatronics and Industrial Informatics (ICMII 2015)* (pp. 89-92). Atlantis Press.

Ertug, G., & Castellucci, F. (2013). Getting what you need: How reputation and status affect team performance, hiring, and salaries in the NBA. *Academy of Management Journal, 56*(2), 407-431.

Fisher, J. D., & Montague, C. (2024). Improving the aggregation and evaluation of NBA mock drafts. *Journal of Quantitative Analysis in Sports*, (0).

Harris, A. R., & Roebber, P. J. (2019). NBA team home advantage: Identifying key factors using an artificial neural network. *PLoS One, 14*(7), e0220630.

HoopsHype web page, https://hoopshype.com/salaries/2023-2024/, Access Date: 18.12.2024.

Horvat, T., Job, J., Logozar, R., & Livada, Č. (2023). A data-driven machine learning algorithm for predicting the outcomes of NBA games. *Symmetry, 15*(4), 798.

Hwang, C. L., & Yoon, K. (1981). Methods for multiple attribute decision making. *Multiple attribute decision making: methods and applications a state-of-the-art survey*, 58-191.

Ji, R. (2020). Research on basketball shooting action based on image feature extraction and machine learning. *Ieee Access*, *8*, 138743-138751.

Juravich, M., Salaga, S., & Babiak, K. (2017). Upper echelons in professional sport: The impact of NBA general managers on team performance. *Journal of Sport Management, 31*(5), 466-479.

Kizielewicz, B., & Dobryakova, L. (2020). MCDA based approach to sports players' evaluation under incomplete knowledge. *Procedia Computer Science*, 176, 3524-3535.

Liu, C. H., Tzeng, G. H., & Lee, M. H. (2012). Improving tourism policy implementation–The use of hybrid MCDM models. *Tourism management, 33*(2), 413-426.

Liu, Y., Yang, Y., Liu, Y., & Tzeng, G. H. (2019). Improving sustainable mobile health care promotion: a novel hybrid MCDM method. *Sustainability, 11*(3), 752.

Liu, Z., & Guo, J. (2025). Research on NBA Event Prediction Based on Hybrid Machine Learning Model. *International Journal of High Speed Electronics and Systems*, *34*(01), 2540171.

Martinez, J. A., & Caudill, S. B. (2013). Does Midseason Change of Coach Improve Team Performance? Evidence From the NBA. *Journal of Sport Management, 27*(2).

Mertz, J., Hoover, L. D., Burke, J. M., Bellar, D., Jones, M. L., Leitzelar, B., & Judge, W. L. (2016). Ranking the greatest NBA players: A sport metrics

analysis. *International Journal of Performance Analysis in Sport*, *16*(3), 737-759.

Nguyen, N. H., Nguyen, D. T. A., Ma, B., & Hu, J. (2022). The application of machine learning and deep learning in sport: predicting NBA players' performance and popularity. *Journal of Information and Telecommunication, 6*(2), 217-235.

Nutting, A. W., & Price, J. (2017). Time zones, game start times, and team performance: evidence from the NBA. *Journal of Sports Economics, 18*(5), 471-478.

Opricovic, S., & Tzeng, G. H. (2004). Compromise solution by MCDM methods: A comparative analysis of VIKOR and TOPSIS. *European journal of operational research, 156*(2), 445-455.

Ouyang, Y., Li, X., Zhou, W., Hong, W., Zheng, W., Qi, F., & Peng, L. (2024). Integration of machine learning XGBoost and SHAP models for NBA game outcome prediction and quantitative analysis methodology. *Plos one*, *19*(7), e0307478.

Özkir, V., & Değirmenci, A. (2023). A novel multiple criteria ranking approach for determining the Most Valuable Player (MVP) of a sport season: A numerical study from NBA league. *Journal of Soft Computing and Decision Analytics, 1*(1), 265-272.

Pradhan, S., & Abdourazakou, Y. (2020). "Power ranking" professional circuit eSports teams using multi-criteria decision-making (MCDM). *Journal of Sports Analytics, 6*(1), 61-73.

Pradhan, S., & Chachad, R. (2021). Re-ranking regular seasons in the National Basketball Association's modern era: A replication and extension of Pradhan (2018). *Journal of Statistics and Management Systems, 24*(7), 1503-1522.

Price, J., Soebbing, B. P., Berri, D., & Humphreys, B. R. (2010). Tournament incentives, league policy, and NBA team performance revisited. *Journal of Sports Economics, 11*(2), 117-135.

Sarlis, V., Papageorgiou, G., & Tjortjis, C. (2024). Injury patterns and impact on performance in the NBA League Using Sports Analytics. *Computation, 12*(2), 36.

Sonatha, Y., Azmi, M., & Rahmayuni, I. (2021). Group Decision Support System Using AHP, Topsis and Borda Methods for Loan Determination in

Cooperatives. JOIV: *International Journal on Informatics Visualization, 5*(4), 372-379.

Sportac web page, https://www.spotrac.com/nba/tax/_/year/2024/sort/tax_total, Access Date: 20.12.2024

Temizel, F., & Bayçelebi, B. E. (2016). The Relationship Between TOPSIS Orders of Financial Ratios and Annual Yield Orders: An Application on Textile Manufacturing Sector. *Anadolu University Journal of Social Sciences, 16*(2), 159-170.

Terzopoulou, Z., & Endriss, U. (2021). The Borda class: An axiomatic study of the Borda rule on top-truncated preferences. *Journal of Mathematical Economics*, 92, 31-40.

Thabtah, F., Zhang, L., & Abdelhamid, N. (2019). NBA game result prediction using feature analysis and machine learning. *Annals of Data Science*, *6*(1), 103-116.

Ulas, E. (2021). Examination of National Basketball Association (NBA) team values based on dynamic linear mixed models. *PLoS one, 16*(6), e0253179.

Vaz de Melo, P. O., Almeida, V. A., & Loureiro, A. A. (2008, August). Can complex network metrics predict the behavior of nba teams?. In *Proceedings of the 14th ACM SIGKDD international conference on Knowledge discovery and data mining* (pp. 695-703).

Weiss, J. B., & Sommers, P. M. (2009). Does team racial composition affect team performance in the NBA?. *Atlantic Economic Journal*, 37, 119-120.

Xu, K., Lin, H. L., & Qiu, J. (2024). Constructing an evaluation model for the comprehensive level of sustainable development of provincial competitive sports in China based on DPSIR and MCDM. *Plos one, 19*(4), e0301411.

Yang, M., Wei, Y., Liang, L., Ding, J., & Wang, X. (2021). Performance evaluation of NBA teams: A non-homogeneous DEA approach. *Journal of the Operational Research Society*, *72*(6), 1403-1414.

Yeung, M. (2025). Multiple Machine Learning Algorithms-based NBA Team Playoffs Prediction. In *ITM Web of Conferences* (Vol. 70, p. 04024). EDP Sciences.

Yilmaz, M. R., & Chatterjee, S. (2000). Patterns of NBA team performance from 1950 to 1998. *Journal of Applied Statistics, 27*(5), 555-566.

Zavadskas, E. K., & Turskis, Z. (2011). Multiple criteria decision making (MCDM) methods in economics: an overview. *Technological and economic development of economy, 17*(2), 397-427.

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