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**BALL POSSESSION AND MATCH RESULTS OF NATIONAL FOOTBALL LEAGUES IN EUROPE:  
A STUDY OF THE 2023-2024 SEASON**Faruk Albay<sup>1</sup>, İzzet İslamoğlu<sup>2</sup>, Yıldırım Kayacan<sup>1</sup>**ABSTRACT**

Objective: The relationship between a football team's possession percentage and its victory has been the subject of numerous studies, with varying findings. The aim of this research is to examine the relationship between ball possession and match outcome in major European football leagues during the 2023-2024 season. Materials and Method: Ball possession percentages, as well as the number of wins, losses, and draws in the English, Spanish, German, and Turkish football leagues, were obtained and compared using the Wyscout statistics database. One-way analysis of variance was applied to normally distributed data, and Tukey post-hoc tests were used for league comparisons. A significance level of  $p < 0.05$  was considered statistically significant for all tests. Results: The research findings showed that teams that won matches had significantly higher ball possession percentages ( $p = 0.001$ ). In league comparisons, except for Turkey, leagues with higher possession percentages also showed significantly higher match win rates ( $p = 0.001$ ). The lowest ball possession percentage among winning teams was observed in the Turkish Süper Lig ( $p = 0.006$ ). In contrast, the highest ball possession percentage among losing teams was found in the Turkish league ( $p = 0.005$ ). Conclusion: It is known that variations in the correlation between match wins and ball possession percentages across studies depend on seasons, countries, and the football characteristics of the leagues. However, the findings of the present research indicate that, in line with current data, ball possession is a significant predictor of match victory in the leading leagues around the world.

**Key words:** Football. Ball possession. Leagues. Analyses.

**Palavras-chave:** Futebol. Posse de bola. Ligas. Análises.

**RESUMO**

Posse de bola e resultados das partidas nas ligas nacionais de futebol na Europa: um estudo da temporada 2023-2024

Objetivo: A relação entre a porcentagem de posse de bola de uma equipe de futebol e sua vitória tem sido objeto de inúmeros estudos, com resultados variados. O objetivo desta pesquisa é examinar a relação entre posse de bola e o resultado das partidas nas principais ligas de futebol europeias durante a temporada 2023-2024. Materiais e Métodos: As porcentagens de posse de bola, bem como o número de vitórias, derrotas e empates nas ligas de futebol da Inglaterra, Espanha, Alemanha e Turquia, foram obtidas e comparadas utilizando a base de dados estatísticos Wyscout. A análise de variância unidirecional foi aplicada aos dados normalmente distribuídos, e testes post-hoc de Tukey foram usados para comparações entre as ligas. Um nível de significância de  $P < 0,05$  foi considerado estatisticamente significativo para todos os testes. Resultados: Os resultados da pesquisa mostraram que as equipes que venceram as partidas apresentaram porcentagens de posse de bola significativamente mais altas ( $p = 0,001$ ). Nas comparações entre ligas, exceto pela Turquia, as ligas com maiores porcentagens de posse de bola também apresentaram taxas de vitória significativamente mais altas ( $p = 0,001$ ). A menor porcentagem de posse de bola entre as equipes vencedoras foi observada na Süper Lig turca ( $p = 0,006$ ). Em contraste, a maior porcentagem de posse de bola entre as equipes perdedoras foi encontrada na liga turca ( $p = 0,005$ ). Conclusão: Sabe-se que as variações na correlação entre vitórias em partidas e porcentagens de posse de bola nos estudos dependem das temporadas, países e características futebolísticas das ligas. No entanto, os achados da presente pesquisa indicam que, de acordo com os dados atuais, a posse de bola é um preditor significativo da vitória em partidas nas principais ligas ao redor do mundo.

## INTRODUCTION

Recent technological advancements have led to an increase in data volume in the field of sports.

Computerized match analysis programs have proven to be particularly effective in gathering this data.

However, the vast amount of information available poses new challenges for its analysis and interpretation.

Questions arise regarding how clubs can best utilize these resources to analyse game tactics, plan training, make accurate transfer decisions, how media companies can better present this information in their broadcasts, and how new scientific findings can be uncovered regarding factors influencing overall sports performance (Link, Hoernig, 2017).

In football performance analysis, ball possession rates are among the most commonly used performance indicators. This importance is easily understood, as possession is a prerequisite for entering the opponent's final third and creating goal-scoring opportunities (Mackenzie, Cushion, 2013).

However, the effectiveness of possession strategies depends on various factors, including players' technical, tactical, and physical skills, as well as team cohesion.

Ball possession, one of the critical elements of modern football, offers numerous strategic advantages, particularly in professional matches.

These include controlling the game tempo, increasing pressure on opponents, and creating goal opportunities by extending possession time.

Since ball possession significantly impacts teams' offensive and defensive performances, it is considered a key indicator of the effectiveness of game systems (Hughes, Franks, 2005).

Rather than being a causal variable, ball possession is the result of an interactive process determined by contextual factors such as the field, opponent quality, tactical structure, and the current scoreline (Pratas et al., 2012; Collet, 2013).

Many academic studies have examined whether ball possession rates influence match outcomes. For instance, teams with higher possession rates have been found to attempt

more shots and concede fewer goals (Lago-Ballesteros, Lago-Penas, 2010).

Oberstone (2009) analyzed field movements associated with the success of English Premier League (EPL) clubs during the 2007-2008 season and identified overall ball possession as one of the critical field factors differentiating clubs into three levels (top four, middle twelve, and bottom four).

Similarly, Lago-Peñas and Dellal (2010), in a study based on match data from the 2008-2009 Spanish Primera División, found that the most successful teams had higher possession percentages and that these strategies were influenced by situational variables. In contrast, Bloomfield et al., (2005) discovered that both successful and unsuccessful teams had higher possession rates in matches they lost compared to those they won.

This study investigates the effects of ball possession rates on winning and losing outcomes in matches played during the 2023-2024 season in the top football leagues of various countries.

The analysis includes both intra-group and inter-group comparisons. It is anticipated that multiple variables may influence the relationship between ball possession and match outcomes.

Based on this premise, the study hypothesizes that ball possession rates are associated with winning and losing outcomes in the world's leading football leagues.

## MATERIAL AND METHODS

This study analysed ball possession rates, as well as the number of wins, losses, and draws, in the 2023-2024 season of the Premier League (England), La Liga (Spain), Bundesliga (Germany), and Super Leagues (Turkey) using the Maçkolik statistical database (OPTA Client System).

This database provides comprehensive football data, including information on wins, losses, accurate and inaccurate passes, ball possession rates, shots, fouls, yellow and red cards, and other match events.

Ball possession was defined as the period during which a team controlled the ball until an opposing player touched it, the referee stopped play, or the ball went out of play (Jones et al., 2004).

Teams' win, loss, and draw outcomes were determined based on match results.

### Statistical Analyses

All results are presented as the means±standard error of the mean (SEM). Statistical comparisons were made using the SPSS 25. statistical software (SPSS, Inc., Chicago, IL). The normality of the data was tested with one-sample Kolmogorov–Smirnov test before analyses.

After verifying that data were normally distributed, one-way analysis of variance (ANOVA) and Tukey-Kramer post hoc tests for multiple comparisons were performed. For all statistical tests,  $p < 0.05$  was considered statistically significant.

### RESULTS

A significant difference was observed in ball possession rates between winning and

losing teams across all leagues ( $p=0.001$ ) (Table 1).

In the English, German, and Spanish football leagues, teams with higher ball possession rates were found to win their matches at a statistically significant level ( $p=0.001$ ). However, in the Turkish league, no significant difference was detected between the ball possession rates of winning and losing teams ( $p=0.693$ ) (Table 2).

A statistically significant difference was identified between the ball possession rates of winning teams in the English league and those in the Turkish league ( $p=0.006$ ), while no significant differences were found between the other leagues. Similarly, a significant difference was observed between the ball possession rates of losing teams in the English league and those in the Turkish league ( $p=0.005$ ), with no significant differences identified among the other leagues (Fig. 1).

**Table 1 - Ball possession rates (%) of winning and losing teams.**

Match	n	Mean	SD	Min.	Max.	p
Losing	1032	47.87	11.877	17	78	0.001
Drawing	724	49.91	11.469	19	81	
Winning	1030	52.13	11.852	22	83	

When all groups were evaluated together regardless of the league, winning teams were found to have significantly higher

ball possession rates ( $P=0.001$ ), while this parameter decreased in draws and losses.

**Table 2 - Comparison of ball possession rates (%) across leagues.**

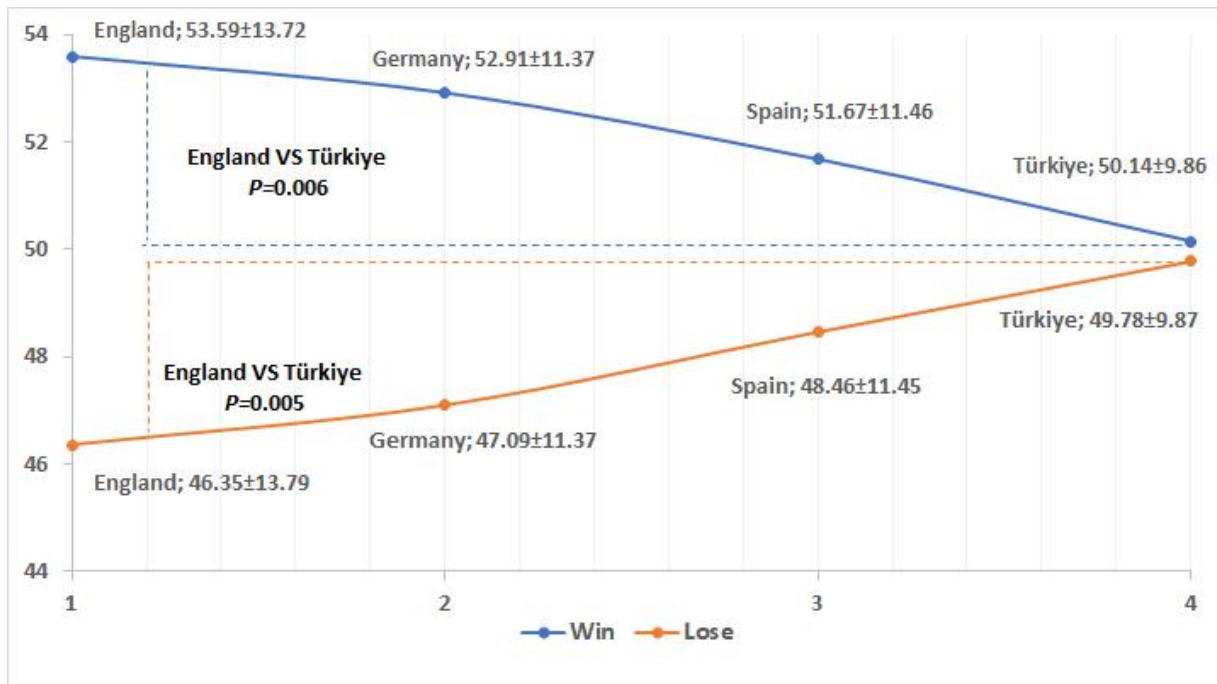
Leagues	Win-Lose	Mean	SD	p
England (n:292)	Losing	46.35	13.795	0.001
	Winning	53.59	13.723	
Germany (n:225)	Losing	47.09	11.365	0.001
	Winning	52.91	11.365	
Spain (n:278)	Losing	48.46	11.457	0.001
	Winning	51.67	11.458	
Türkiye (n:237)	Losing	49.78	9.871	0.693
	Winning	50.14	9.863	

Except for the Turkish league ( $p=0.693$ ), a statistically significant difference was identified in ball possession rates between winning and losing teams in other leagues ( $p=0.001$ ).

Among the winning teams, the highest ball possession rate was observed in England

(53.59), while the lowest rate was observed in Turkey (50.14).

Conversely, among the losing teams, the highest ball possession rate was recorded in Turkey (49.78), whereas the lowest rate was found in the English league (46.35).



**Fig. 1** - Comparison of ball possession rates ( $\pm$ , %) between winning and losing teams according to leagues.

In terms of the winning parameter, England had the highest ball possession rate among the leagues, followed by Germany, Spain, and Turkey. However, a statistically significant difference was found only between England and Turkey (Win  $p=0.006$ ; Lose  $p=0.005$ ). No significant differences were observed between the other leagues for this parameter.

## DISCUSSION

In football, ball possession is the ability to maintain control of the ball without losing it to the opponent. Scoring a goal is impossible without the ball and winning is not possible without scoring a goal. Therefore, ball possession is one of the key elements for success and victory (Hughes, Bartlett, 2005; Gomez, Alvaro, 2002).

In this study, a statistically significant relationship was found between higher ball possession rates and match victories for teams in the top football leagues of four countries. This result is consistent with findings in the literature.

For example, it has been found that successful teams in the English Premier League (EPL) maintained ball possession for significantly longer than unsuccessful teams,

regardless of the match score (Jones et al., 2004).

Similarly, in Spain (La Liga), top-tier teams demonstrated significantly higher ball possession percentages compared to mid-tier teams in the league. The results show that, regardless of match status (winning, losing, or drawing), successful teams maintained the ball significantly longer than unsuccessful teams (Lago-Ballesteros, Lago-Peñas, 2010).

However, higher ball possession alone does not guarantee success, as teams that win matches may, in fact, possess the ball less compared to those they lose against. This can be explained by changes in tactics depending on whether a team is ahead or behind. Ball possession is one of the most commonly studied performance indicators, but its relationship with team performance still requires further clarification (Lago, Martin, 2007; Castellano et al., 2012).

In our study, the highest ball possession percentage was found for winning teams in the English league (53.59%). However, this rate was only significantly higher than that of winning teams in the Turkish league. There was no significant difference in ball possession between winning teams in the English league and those in Germany or Spain.

Ball possession does not guarantee a win, but it determines the tempo and rhythm of the game and, most importantly, forces the opponent to exert more energy. The world's best teams are distinguished by their nearly perfect ability to protect and use the ball in every situation.

They are experts at building the game from defense under pressure (Schreiner, Elgert, 2013).

Lago-Peñas and Dellal (2010), in their study of elite football teams' ball possession strategies in 2008-2009 Spanish La Liga matches, found that higher-ranked teams had a higher ball possession percentage and maintained more consistent and less disrupted game patterns.

It was also found that home teams had more ball possession compared to away teams, and playing against strong opponents reduced a team's ball possession time. In an analysis of Premier League matches from 1996-1997, teams with greater ball possession than their opponents had a much lower likelihood of losing and won nearly 50% of their matches (Carling, Williams, Reilly, 2005).

This study also examined the ball possession rates of losing teams. The highest rate was observed in the losing teams of the Turkish league (49.78%), while the lowest rate was observed in the English league (46.35%).

A significant difference was found between the losing teams' ball possession rates in these two leagues. It is noteworthy that losing teams in Turkey had a higher ball possession rate than all other leagues. This difference may stem from the quality gap between the leagues and the specific game strategies employed in each league.

Some teams, when ahead in the early minutes of a match or when the goal difference increases, may focus on scoring more goals, while others, upon realizing that the match is already won, may reduce their ball possession rate.

This second situation may apply within the Turkish league. James, Mellalieu, and Hollely (2002), and Lago and Martin (2007) found that teams reduced their ball possession when ahead, indicating a preference for counter-attacking or direct play.

Conversely, when behind, teams increased their ball possession rate, preferring to "control" the game through possession. On

the other hand, one study found that possessing the ball to create goals was less important than completing difficult passes (Alamar, 2011) and Blommfield, Polman, and O'Donoghue (2005) analyzed teams' ball possession in relation to the evolving match situation (i.e., whether the team was ahead, behind, or tied).

They found that successful and unsuccessful teams spent more time possessing the ball when they were behind, compared to when they were ahead.

Similarly, Thomas, Reeves, and Davies (2004) suggested that playing at home or away is significant. Many coaches believe that the playing style ("direct play" or "possession play") of each team is an important factor in explaining performance.

As expected, ball possession time is higher when losing, compared to winning or drawing, and ball possession time decreases when playing against stronger opponents (Lago, Dellal, 2010).

Additionally, playing away reduces ball possession by about 2% compared to home games (Lago, Dellal, 2010).

However, most studies have only analyzed a single team's performance over multiple time periods, which limits the ability to generalize (Lago, 2009; Lago-Ballesteros et al., 2012; Lago, Martin, 2007; Taylor et al., 2008). Therefore, there is a need to validate models developed on multiple teams.

In football analysis, some systems provide valuable insights into the performance of successful and unsuccessful teams during a match by offering statistics related to players' actions (e.g., ball control, passing, shots on goal, fouls, etc.) (Moura et al., 2013). Ball possession and pass success percentages can also be added to this list.

## CONCLUSION

The limitations of the presented study include the analysis of only one season, the inclusion of only four leagues, and the failure to consider the location of the match (home/away).

The most significant finding of the study is that ball possession rate is an important factor in match victories. However, the high ball possession time of winning teams does not necessarily mean that the match will be won.

Other factors influencing the outcome must also be considered. Ball possession is

affected by numerous variables, such as the match location, the match's importance, the team's playing strategy, and the opponent's quality. In fact, every team knows it must possess the ball more to maintain control of the game.

However, teams must also investigate and interpret the reasons for ball loss and develop their game plans and player profiles accordingly.

Many studies have shown that any factor contributing to the breakdown between the passer and the receiver plays a significant role in ball loss. It should also be noted that ball loss is an indicator of performance errors between players. It is a fact that good football is played by good players, who will lose possession less frequently and keep the ball with their team for longer.

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1 - Faculty of Yaşar Doğu Sport Sciences,  
University of Ondokuz Mayıs, Körfez Mh,  
Atakum, Samsun, Türkiye.

2 - Ondokuz Mayıs University, Türkiye..

Email dos autores:  
faruk.albay@omu.edu.tr  
izzetislamoglu@gmail.com  
kayacan@gmail.com

Corresponding author:  
İzzet İslamoğlu.  
izzetislamoglu@gmail.com  
Faculty of Yaşar Doğu Sport Sciences.  
University of Ondokuz Mayıs.  
Körfez Mh, Atakum, Samsun, Türkiye.