

Offensive and defensive team performances: relation to successful and unsuccessful participation in the UEFA Champions League 20/21

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Abstract:

The primary factor that determines a football team's performance is its ability to score goals. Due to the rarity of successfully scored goals in a match, it is vital for teams to consistently create scoring opportunities while preventing their opponents from doing the same. The purpose of this study is to determine (1) the effect of offensive and defensive performance indicators on a team's success and (2) the impact of the 'first goal effect' on the matches (for the team that scored the goal: win, draw or lose) in the UEFA Champions League 20/21. The sample of this study comprises 152 matches from the tournament's group and knockout phases. The performance indicators were fourteen selected offensive and defensive variables. The results of the study reveal that the successful teams had higher values ($p < 0.05$) in all offensive (except shots off goal for the team) and defensive (except the percentage of shots on goal against and percentage of shots off goal against) performance indicators than unsuccessful teams. In the group stage, the teams that scored first won 71.1% of their total matches ($p < 0.001$). In the knockout stage, the first goal effect had a greater impact on the outcome of matches than it did in the group stage ($p < 0.001$), as evidenced by the fact that, in 81.3% of the cases, the team that scored first won the match. Successful teams appear to perform better across the board in terms of offence and defence. This data directly impacts coaches, providing pertinent information for developing goal-scoring strategies.

Keywords: football, post-match analysis, performance indicators, winners and losers, analysis of difference

Introduction

Football, or soccer, is a sport performed by individuals with different levels of expertise (Stølen et al., 2005) and is influenced by physical, technical and tactical elements that contribute to a team's success (Folgado et al., 2018; Stølen et al., 2005). Football involves constant and dynamic interactions between the members of two opposing teams, which change continuously throughout the game and happen when one of the two teams modifies their behaviour to prevent the opposing team from executing an action (Lames & McGarry, 2007). According to Yiannakos and Armatas (2006), tactics and strategy are key factors that influence the final result of a match. Offensive and defensive tactics in football are associated with performance indicators, a selection of action variables that define aspects of a performance (Hughes & Bartlett, 2002).

Performance analysis has been firmly established as a vital aspect of the coaching process (Groom et al., 2011), and the amount of research placed into performance analysis has increased significantly over time (Lago, 2009). Performance analysis in football has received much attention, as it is assumed to be essential to enhancing a team's performance (Mackenzie & Cushion, 2013). Football involves the interactions between defensive and offensive playstyles. By considering the opposition's playing style, it is easy for a team to identify their performance indicators (Moura et al., 2013). An action variable selection or combination used to characterise some or all aspects of performance is known as a performance indicator (Hughes & Bartlett, 2002). The analysis of performance indicators in football is believed to enhance a team's performance. This can be seen through the development of key performance indicators by sports science coaching staff (Carling et al., 2005; Hughes & Bartlett, 2002). In addition to that, a coach is able to use the data gathered from the opposing team to identify its strengths and weaknesses.

In recent times, the ability to score goals has gained a lot of attention in football literature, where it is seen as the ultimate determinant of what constitutes a successful football team (Tenga, 2013). A successful team is one that is seen to create goal-scoring opportunities frequently and is one that prevents its opposition from doing the same. A previous study showed that successful teams had higher numbers of scoring trials, attempts at on target shots and percentages of number of goals per attempt than unsuccessful teams (Szwarc, 2007). In the

Spanish First League and Greek First League, top teams had more shots on goal, which are highly effective, than teams at the bottom of the rankings (Lago-Peñas et al., 2010). A previous study has proven that successful and unsuccessful teams can be differentiated by their number of total shots, shots on goal and ball possessions (Liu et al., 2015). A previous study compared the offensive and defensive performances seen in the group and knockout stages of the 2010 FIFA World Cup. Successful teams were found to have greater offensive and defensive performances than unsuccessful teams in all areas except shots off goal for and shots off goal against (Delgado Bordonau et al., 2013).

Several defensive performance indicators were found to be lower in the knockout round compared to the group stage. Yet, the comparison of defensive performances between successful and unsuccessful teams remained unchanged (Delgado Bordonau et al., 2013). Regardless of either offensive or defensive performance, the first goal effect is shown to contribute to a team winning. In a low-scoring sport like football, scoring the game's first goal may be crucial for victory (Pratas et al., 2016). According to Armatas and Yiannakos (2010), the team that scored first won the game in 70% of the matches in the 2006 World Cup. The latest study of the first goal effect, done by Lane et al. (2020), showed that 70% of the matches in the Portuguese Premier League were won by the teams that scored first. Even though numerous performance indicators have been proposed, several situational variables, such as match location, quality of the opposition (García-Rubio et al., 2015), competition stage and match status, need to be considered, as they may influence a game's outcome. Past studies have shown that the teams that score first have higher chances of winning their matches, particularly at home (Armatas et al., 2009; Molinuevo & Bermejo, 2012). According to Inan et al. (2019), the 'home factor' encourages the home team to score first, thus leading to them winning the match.

To date, many performances analysis studies have focused on the offensive and defensive gameplay styles. According to Lane et al. (2020), in the Australian Football League, offensive and defensive playstyles increased from 2005 to 2007. However, in 2019, the pattern was reversed, as defensive playstyles were seen to be more commonly used than offensive playstyles in matches that year. Therefore, this study is not linked to previous research (Delgado Bordonau et al., 2013), which has shown that successful teams have a more offensive playstyle than unsuccessful teams. This research inspired the researchers of this study to update the data on the offensive and defensive performances of successful and unsuccessful teams that competed in the UEFA Champions League and to analyse the performance factors that affected successful teams at the UEFA Champions League.

This update needed to be analysed through a comparison between the offensive and defensive performances of both successful and unsuccessful teams. The teams participating in the UEFA Champions League are the top teams of the Europa League; hence, their offensive and defensive performances are the ideal samples. On the basis of current evidence, it is possible to hypothesize that (1) successful teams will outperform unsuccessful teams in terms of offensive performance. (2) the poorer the opponent's performance is in a match, the greater the offensive performance of the winning team will be and (3) the first goal effect contributes to winning a match. This study aims to analyse the impact of selected offensive and defensive variables on successful and unsuccessful team performances in the UEFA Champions League 20/21. This study also aims to determine the impact of the first goal effect on the match result (win, draw, or loss) for the team that scored the first goal in the UEFA Champions League 20/21. We hypothesise that successful teams will have better offensive and defensive performances than unsuccessful teams. We also hypothesise that the match's first goal will influence its outcome.

Material & methods

Case report

The final phase of the UEFA Champions League 20/21 was comprised of a group stage and four knockout rounds. During the group stage, the teams were split up into a total of eight groups, each consisting of four different teams. Each team played its group opponents twice, both at home and away. The teams that placed first and second in their respective group were advanced to the first knockout stage.

The two bottom teams their respective group were eliminated. From the last 16 to the semi-finals, teams played home and away games against each other. Only a single match was played for the finals. The UEFA Champions League 20/21's final stage featured 152 games in total: 126 in the group stage and 26 in the knockout stage. Thus, each team competed in a total of six to thirteen games. The relevant match information was retrieved from the official UEFA website (<https://www.uefa.com/uefachampionsleague/statistics/>).

Procedure

The selected teams were separated into successful and unsuccessful teams based on the round the team ended in the tournament. Successful teams were defined as the teams that reached the semi-finals and beyond. While unsuccessful teams were defined as the teams that did not pass the group stage. Table 1 shows the list of teams by team category. Four teams were in the successful category and sixteen were in the unsuccessful category. The variables under study were separated into two categories: offensive and defensive. This study's variables were adopted from Delgado Bordonau et al. (2013) as shown in Fig. 1.

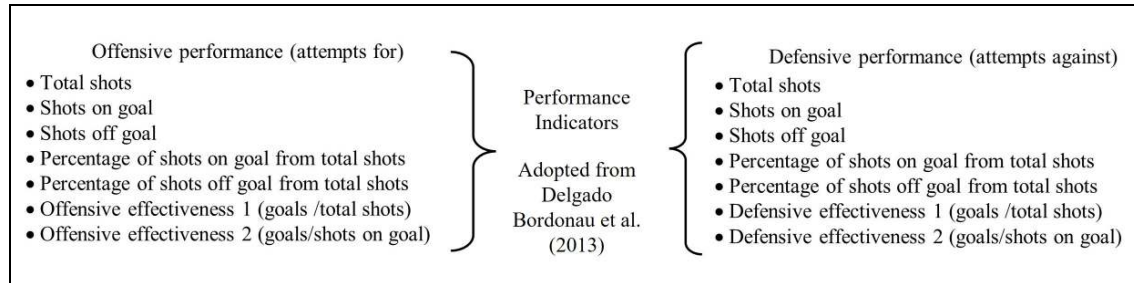


Fig. 1 Performance Indicators

Table 1. Team Category in the UEFA Champions League 20/21

Team Category	Team	Final Raking
Successful Team	Chelsea	1
	Manchester City	2
	Real Madrid	3
	Paris Saint Germain	4
Unsuccessful Teams	RB Salzburg	Group Stage
	Lokomotiv Moscow	
	Shakhtar Donetsk	
	Inter Milan	
	Olympiacos	
	Marseille	
	Ajax	
	Midtjylland	
	Krasnodar	
	Rennes	
	Club Brugge	
	Zenit	
	Dynamo Kyiv	
	Ferencváros	
	Manchester United	
	Istanbul Basaksehir F. K.	

Statistical analysis

The Statistical Package for Social Sciences (SPSS) version 25.0 was used to analyse the data in this study. All offensive and defensive variable data were presented as mean rank. The disparities between the successful and unsuccessful teams were examined using the Mann-Whitney U Test. Meanwhile, the chi-square (χ^2) statistic was used to analyse the first goal effect. All analyses were carried out with the significance level set to $P \leq .05$.

Results

Offensive performance

The offensive results of successful and unsuccessful teams are reported in Table 2. Except for shots off goal for, successful teams had higher values for all offensive performance indicators than unsuccessful ones.

Table 2. Offensive outcomes in unsuccessful and successful football teams in the UEFA Champions League 20/21

Offensive Variable	Successful Teams	Unsuccessful Teams	P-value
Goals	96.19	66.85	*.001
Total shots for	90.74	69.52	*.005
Shots on goal for	97.81	66.05	*.001
Percentage of shots on goal for	91.67	69.06	*.003
Shots off goal for	79.66	74.95	.531
Percentage of shots off goal for	62.23	83.45	*.005
Percentage of offensive effectiveness 1	90.71	69.53	*.005
Percentage of offensive effectiveness 2	84.94	67.72	*.018

* $p < .05$

Defensive performance

The defensive outcomes are presented in Table 3. With the exception of percentage of shots on goal and percentage of shots off goal against, successful teams outperformed unsuccessful ones in all defensive performance indicators.

Table 3. Defensive outcomes in unsuccessful and successful football teams during the UEFA Champions League 20/21

Defensive Variable	Successful Teams	Unsuccessful Teams	P-value
Goals against	47.83	90.55	*.001
Total shots against	54.71	87.18	*.001
Shots on goal against	55.17	86.96	*.001
Percentage of shots on goal against	66.74	81.28	.055
Shots off goal against	62.57	83.33	*.006
Percentage of shots off goal against	86.26	71.72	.055
Percentage of defensive effectiveness 1	52.86	88.09	*.001
Percentage of defensive effectiveness 2	53.74	83.86	*.001

* p<.05

The first goal effect

During the group stage, with reference to Table 4, the teams that scored first had a total match outcome of 71.1% wins, 15.6% losses and 13.3% matches that ended in draws. The first goal effect, however, had a greater impact on the result of the game in the knockout stage than it did in the group stage, as shown by the fact that, in 81.3% of the cases, the team that scored first won the match, while only 6.3% of them lost and 12.5% of them ended their matches in draws.

Table 4. First goal outcome crosstabulation in the group stage

			Win	Lose	Draw	Total
First Goal	Yes	Count	*32	7	6	45
		% within First Goal	71.1%	15.6%	13.3%	100.0%
	No	Count	2	61	18	81
		% within First Goal	2.5%	75.3%	22.2%	100.0%

* p<.05

Table 5. First goal outcome crosstabulation in the knockout stage

			Win	Lose	Draw	Total
First Goal	Yes	Count	*13	1	2	16
		% within first goal	81.3%	6.3%	12.5%	100.0%
	No	Count	3	5	2	10
		% within first goal	30.0%	50.0%	20.0%	100.0%

* p<.05

Discussion

With regards to offensive performance, one of the main differences between this study and previous studies (Brito de Souza et al., 2019; Delgado Bordonau et al., 2013; Gamble et al., 2019) is the population of the study. The present study's population is comprised of the teams who participated in the UEFA Champions League 20/21, the latest league involving the highest performing teams in Europe. Therefore, this research is one of the latest studies on the UEFA Champions League and has determined the newest trends of performance indicators for successful and unsuccessful teams.

A comparison of the present findings to those of earlier studies (Brito de Souza et al., 2019; Delgado Bordonau et al., 2013; Gamble et al., 2019) revealed that all previous studies showed that successful teams had greater offensive variables related to goal-scoring (shots and goals) in different leagues. However, the present findings show that successful teams were offensively better than unsuccessful teams in all analysed variables except shots off goal. There was no notable distinction between successful and unsuccessful teams. Successful teams created more shots towards the opponent, especially shots on target, which led to higher rates of goal-scoring. Thus, their offensive strategies were considerably more effective than unsuccessful teams. As such, the results seemingly suggest that the teams need to work more on the accuracy of their shots, as the quality of the shot is more important than the number of shots made (Mao et al., 2016). This could suggest that the elements of accuracy and persistency should be included in training to enhance the quality of shots made by the team, thus increasing their chances of goal-scoring. Unfortunately, this study did not cover the entire range of offensive variables in football. Freekicks, corners and throw-ins should be included in future research to ensure more accurate and precise findings.

For defensive performance, this study revealed a significant difference in the impact of defensive performance in relation to team success rates in the UEFA Champions League 20/21. A comparison of the present findings to those of earlier studies (Brito de Souza et al., 2019; Delgado Bordonau et al., 2013; Gamble et al., 2019) revealed that all previous studies showed that successful teams had greater defensive variables in different leagues. The findings of this study, however, show that successful teams had better defences than

unsuccessful teams in all analysed variables except percentage of shots on goal against and percentage of shots off goal against, where there was no significant distinction between successful and unsuccessful teams. One possible explanation for this result could be due to the present study only testing for overall defensive performance, unlike the study done by Delgado Bordonau et al. (2013), which compared the offensive and defensive performances seen in the group and knockout stages for more accurate results. The present study found that unsuccessful teams conceded more shots to their opponents, which led to goal-scoring, thus having worse defensive efficacy when compared to successful teams. Similarly, other studies also concentrated on defensive variables, including the ability to regain possession of the ball (Gamble et al., 2019) and defensive transitions (Casal et al., 2016).

The findings of this study also show the significant effect the first goal effect had in the UEFA Champions League 20/21, where scoring the first goal likely contributed to a team winning a game. The present study focused on the first goal effect in both the group and knockout stages. The study done by Delgado Bordonau et al. (2013) reported a similar finding regarding the first goal effect and its impact on the outcome of a game (winning, drawing or losing). In the group stage, the teams that scored the first goal had the following outcomes in their total matches: 71.1% of them won, 15.6% of them lost and 13.3% of them ended their matches in draws ($p < 0.001$). In the knockout stage, the effect of the first goal had a greater impact on the outcome of a match than in the group stage ($p < 0.001$). 81.3% of these matches were won by the teams that scored first, while only 6.3% of them ended their games in losses and 12.5% of them ended in draws. Similarly, other studies concentrated on home and away games (García-Rubio et al., 2015; Pratas et al., 2016; Tenga et al., 2010). Therefore, it can be theorised that the first goal effect triggers teams to play more cautiously after scoring the first goal, especially in the knockout stage, as it influences the match outcome. Therefore, the results suggest that teams should play offensively at the beginning of a match to obtain the first goal, before applying a defensive strategy.

Conclusions

The results of this research confirm our hypotheses, and we may conclude that successful teams have better offensive and defensive performances than unsuccessful teams. The present study showed that successful teams in the UEFA Champions League 20/21 had better offensive performances in all areas except shots off goal when compared to unsuccessful teams. Regarding defensive performance, successful teams in the UEFA Champions League 20/21 had better defensive performances in all areas except percentage of shots on goal against and percentage of shots off goal against than unsuccessful teams. This data has direct implications for coaches, since it provides pertinent information for planning finishing practices. The finishing of a game, from both offensive and defensive standpoints, must be considered significant, as it directly affects the result of a match.

Furthermore, also established in our results regarding the first goal effect on a match's outcome, the team that scores first in the group stage is more likely to win the match. In the knockout stage, the effect of the first goal is more significant. This information is useful for coaches in developing technical and tactical strategies. As per the first goal effect, it is important to include psychological training to prepare players for the event that the opponent scores first.

It is recommended that future studies compare the offensive and defensive performances in the different stages of their selected competitions. In addition to that, it is also recommended that future studies analyse the home and away factors contributing to a match's outcome. The methods used in this study are replicable and may be used to analyse team performance at various levels of competition.

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References

- Armatas, V., & Yiannakos, A. (2010). Analysis and evaluation of goals scored in 2006 World Cup. *Journal of Sport and Health Research*, 2, 119-128.
- Armatas, V., Yiannakos, A., Papadopoulou, S., & Skoufas, D. (2009). Evaluation of goals scored in top ranking soccer matches: Greek "Super League" 2006-07. *Serbian Journal of Sports Sciences*, 3, 39-43.
- Brito de Souza, D., Campo, L.-D., Blanco-Pita, H., Resta, R., & Del Coso, J. (2019). An extensive comparative analysis of successful and unsuccessful football teams in LaLiga. *Frontiers in Psychology*, 10, 2566.
- Carling, C., Williams, A. M., & Reilly, T. (2005). Handbook of soccer match analysis: A systematic approach to improving performance.
- Casal, C. A., Andujar, M. Á., Losada, J. L., Ardá, T., & Maneiro, R. (2016). Identification of defensive

- performance factors in the 2010 FIFA World Cup South Africa. *Sports*, 4, 54.
- Delgado Bordonau, J. L., Domenech Monforte, C., Guzmán Luján, J. F., & Méndez Villanueva, A. (2013). Offensive and defensive team performance: relation to successful and unsuccessful participation in the 2010 Soccer World Cup.
- Folgado, H., Gonçalves, B., & Sampaio, J. (2018). Positional synchronization affects physical and physiological responses to preseason in professional football (soccer). *Research in Sports Medicine*, 26, 51-63.
- Gamble, D., Bradley, J., McCarren, A., & Moyna, N. M. (2019). Team performance indicators which differentiate between winning and losing in elite Gaelic football. *International Journal of Performance Analysis in Sport*, 19, 478-490.
- García-Rubio, J., Gómez, M. Á., Lago-Peñas, C., & Ibáñez, J. S. (2015). Effect of match venue, scoring first and quality of opposition on match outcome in the UEFA Champions League. *International Journal of Performance Analysis in Sport*, 15, 527-539.
- Groom, R., Cushion, C., & Nelson, L. (2011). The delivery of video-based performance analysis by England youth soccer coaches: towards a grounded theory. *Journal of applied sport psychology*, 23(1), 16-32.
- Hughes, M. D., & Bartlett, R. M. (2002). The use of performance indicators in performance analysis. *Journal of sports sciences*, 20, 739-754.
- Inan, T., Cetin, B., & Gungorur, O. (2019). The Effect of the First Goal on Match Score in Football for the Home Field Advantage. *Journal of Education and Training Studies*, 7, 62-66.
- Lago-Peñas, C., Lago-Ballesteros, J., Dellal, A., & Gómez, M. (2010). Game-related statistics that discriminated winning, drawing and losing teams from the Spanish soccer league. *Journal of sports science & medicine*, 9, 288.
- Lago, C. (2009). The influence of match location, quality of opposition, and match status on possession strategies in professional association football. *Journal of sports sciences*, 27(13), 1463-1469.
- Lames, M., & McGarry, T. (2007). On the search for reliable performance indicators in game sports. *International Journal of Performance Analysis in Sport*, 7, 62-79.
- Lane, J. C., van der Ploeg, G., Greenham, G., & Norton, K. (2020). Characterisation of offensive and defensive game play trends in the Australian Football League (1999–2019). *International Journal of Performance Analysis in Sport*, 1-12.
- Liu, H., Yi, Q., Giménez, J.-V., Gómez, M.-A., & Lago-Peñas, C. (2015). Performance profiles of football teams in the UEFA Champions League considering situational efficiency. *International Journal of Performance Analysis in Sport*, 15, 371-390.
- Mackenzie, R., & Cushion, C. (2013). Performance analysis in football: A critical review and implications for future research. *Journal of sports sciences*, 31, 639-676.
- Mao, L., Peng, Z., Liu, H., & Gómez, M.-A. (2016). Identifying keys to win in the Chinese professional soccer league. *International Journal of Performance Analysis in Sport*, 16, 935-947.
- Molinuevo, J. S., & Bermejo, J. P. (2012). The effect of scoring first and home advantage in professional Spanish football and indoor soccer leagues *Revista de psicología del deporte*, 21, 301-308.
- Moura, F. A., Martins, L. E. B., Anido, R. O., Ruffino, P. R. C., Barros, R. M. L., & Cunha, S. A. (2013). A spectral analysis of team dynamics and tactics in Brazilian football. *Journal of sports sciences*, 31, 1568-1577.
- Pratas, J. M., Volossovitch, A., & Carita, A. I. (2016). The effect of performance indicators on the time the first goal is scored in football matches. *International Journal of Performance Analysis in Sport*, 16, 347-354.
- Stølen, T., Chamari, K., Castagna, C., & Wisløff, U. (2005). Physiology of soccer. *Sports medicine*, 35, 501-536.
- Szwarc, A. (2007). Efficacy of successful and unsuccessful soccer teams taking part in finals of Champions League. *Research Yearbook*, 13, 221-225.
- First goal and home advantage at different levels of play in professional soccer, Performance analysis of sport IX 71-75 (Routledge 2013).
- Tenga, A., Holme, I., Ronglan, L. T., & Bahr, R. (2010). Effect of playing tactics on goal scoring in Norwegian professional soccer. *Journal of sports sciences*, 28, 237-244.
- Yiannakos, A., & Armatas, V. (2006). Evaluation of the goal scoring patterns in European Championship in Portugal 2004. *International Journal of Performance Analysis in Sport*, 6, 178-188.