

ASSESSING THE IMPACT OF ASSISTS IN OFFENSIVE EFFICIENCY AND GAME OUTCOMES IN EUROLEAGUE BASKETBALL

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Abstract: Assists in basketball are considered a key metric of team play and offensive efficiency. The purpose of the study was to examine how assist performance influences team offensive efficiency and game outcomes in the EuroLeague. Data from 224 games of the 2024-2025 EuroLeague regular season were analyzed, including game context, basic and advanced assist metrics, and shooting and performance efficiency metrics. The Mann-Whitney U test measured the differences in these variables between the winning and losing teams, and Spearman's rank-order correlation assessed the strength and direction of associations between assist-related variables, offensive efficiency, and game results. The findings showed that the winning teams recorded significantly higher assist-related metrics ($p < .001$) and higher efficiency ($p < .001$) compared to the losing teams. The Spearman analysis revealed a strong positive correlation between assist-related metrics and offensive efficiency ($p < .001$). A weaker association was observed between assist-related metrics and game outcome ($p < .05$). The assist-to-turnover ratio emerged as a key factor contributing to offensive output and, to a lesser extent, to winning outcomes in elite-level basketball. Data-driven analysis helps optimize team coordination, identify patterns, and promote a culture of effective ball movement, which is vital in elite basketball.

Introduction

As a multidimensional and dynamic team sport, basketball has advanced considerably, with teams increasingly employing offensive and defensive systems that emphasize spacing, tempo control, greater reliance on three-point shots, off-ball movement, and decision-making under pressure (Foteinakis & Pavlidou, 2024; Zajac et al., 2023; Stamiris et al., 2020; Kinrade et al., 2015). Performance analysis has also developed significantly, allowing recording, analysis, and evaluation of individual and team performance (Foteinakis et al., 2024; Gomez-Ruano et al., 2020; Sarlis & Tjortjis, 2020; Zuccolotto et al., 2017). This progression goes beyond traditional scoring metrics, incorporating advanced box-score and tracking data to better quantify team success and strategies (Turner & Franks, 2021).

Statistical analysis in basketball has traditionally focused on scoring ability, with point-related metrics being primary in evaluating team performance. Although traditional and advanced statistics such as points per game, field goal percentage, and offensive rating are still relevant, they do not fully capture how game-related statistics influence team success (Goldsberry, 2012). Research in basketball analytics shows that it is more important to consider multiple factors beyond just scoring variables when measuring team performance (Turner & Franks, 2021). Among the numerous variables affecting basketball performance, assists (AST) have been an important indicator of team play and offensive efficiency (Skinner, 2010). An AST is a pass that directly leads to a scored basket (Melnick, 2001), highlighting not only a team's ability to create scoring opportunities but also the collaborative nature of the game. In the EuroLeague, where top teams and players from Europe compete, understanding how AST impacts overall performance is essential (Kubatko et al., 2007).

The role of AST in basketball has garnered significant interest among researchers and analysts, and smooth ball movement is widely regarded as a key factor in winning games (Supola et al., 2022). Early studies focused on the basic statistical contributions of AST, often linking them to team success (Karipidis, Fotinakis et al., 2001; Melnick, 2001). Oliver (2004) introduced the "assist percentage", which measures the proportion of team plays resulting in an AST, underscoring its importance in analyzing offensive efficiency. Kubatko et al. (2007) also developed the "Player Efficiency Rating", where AST is a major component, emphasizing its relevance to team success and offensive efficiency.

Recent research has further explored how AST influences offensive efficiency, highlighting its importance in elite team performance. Analyses of team play during the Paris Olympics showed that high-scoring teams relied heavily on assists, while lower-scoring teams mainly relied on individual actions, which limited the overall impact of AST (Wang et al., 2025). In NBA and NCAA games, teams with the highest number of assists and secondary assists (a pass that leads to an assist) were more successful and could generate more and higher-quality shots, while winning teams demonstrated significantly higher numbers of passes per possession, confirming that increased ball circulation is positively associated with offensive effectiveness (Karamousalidis et al., 2025; Supola et al., 2022; Stančin & Jović, 2018). Additionally, teams with many ASTs tend to demonstrate better decision-making, improved ball movement, offensive fluidity, and efficiency, characteristics more common among winning teams (Garcia et al., 2013; Sampaio et al., 2010). Supporting these findings, the “expected points added” framework in basketball enables quantifying each action, such as AST, in terms of its contribution to the overall team score, offering a more detailed view of AST value (Cervone et al., 2016). In the EuroLeague, AST was identified as playing a pivotal role with a significant impact on game outcome (Mikolajec et al., 2021). Moreover, Özmen (2016) demonstrated that higher-performing teams have substantially more ASTs, especially in more competitive stages. Conversely, Çene (2018) reported that ASTs did not significantly influence close, balanced, or unbalanced games within the league.

Despite advances in basketball metrics, the influence of AST-related data on offensive efficiency and game results remains underexplored, particularly given the diverse playing styles of the EuroLeague, from fast-paced transition plays to structured half-court sets. Using a dataset that includes both traditional and advanced statistics, such as AST, assist-to-turnover ratio, assisted points ratio, and assists ratio, this research aims to better understand how ASTs support team success. The study explores key questions, such as the link between AST and offensive efficiency and which advanced metrics best capture the AST value compared to traditional stats. The results will deepen insights into the role of AST in team success and identify emerging strategic trends throughout the league, providing practical guidance to coaches and analysts to boost performance, refine offensive tactics, and promote player development, emphasizing the crucial role of AST in top-tier European basketball. The purpose of this study was to examine how AST performance influences team offensive efficiency and game outcomes in the EuroLeague. Specifically, it seeks to analyze the relationship between AST metrics and team success, evaluate AST’s impact on offensive efficiency, and connect traditional statistics with advanced performance measures. It was hypothesized that higher assist-related metrics would be positively associated with greater offensive efficiency and that winning teams would demonstrate higher assist-related values than losing teams. Additionally, advanced assist metrics would better explain team performance compared to traditional statistics.

Methods

Sample

The study utilized game data from the official box scores of the first 25 rounds of the EuroLeague regular season 2024–2025, which are available on the open-access official EuroLeague website (<https://www.euroleaguebasketball.net/en/euroleague/stats/>). The sample included data from 18 EuroLeague teams, with each team playing 25 games, except for two teams that played 24 games due to flu cases, which led to the postponement of their game according to EuroLeague regulations. The total number of games analyzed in this study was 224. Because EuroLeague game-related statistics are publicly available, approval from the Institutional Review Board was not required for this project (Navalta et al., 2019).

Variables and Procedure

The dataset contained two observations per game, one for each team, totaling 448 observations from 224 games. It included variables such as game context (Win/Loss and WIN%), basic assist metrics like AST count and assist-to-turnover ratio (AST/TO), shooting efficiency metrics such as eFG%, and advanced performance measures like offensive rating (OFFRTG). Additionally, composite metrics such as AST Ratio and Assisted Points Ratio (APR) were calculated to provide a more detailed view of the impact of assists. APR shows the percentage of points from assisted shots relative to the total points scored by the team in each game. Its strength lies in being unaffected by factors such as game pace, allowing for comparisons across teams with different tempos. It remains consistent whether a game is high or low scoring, serving as an objective indicator of team cooperation. All variable definitions are provided in Table 1.

Table 1. Definition of the examined variables.

Metric	Definition
Win/Lose	The team won or lost the game
Win Percentage (WIN%)	The percentage of games played that a team has won
Assists (AST)	The number of assists (passes that lead directly to a made basket)
Assists Ratio (AST Ratio)	The number of assists made by the team per 100 possessions
Assists to Turnover Ratio (AST/TO)	The number of assists for a team compared to the number of turnovers
Assisted Points Ratio (APR)	Measures the percentage of points coming from assisted shots among total points for each team in each game. The metric was calculated using the formula: $APR = \{(ASTED_2FG \times 2 + ASTED_3FG \times 3 + ASTED_FT) / PTS\} \times 100$
Effective Field Goal (eFG%)	A pace-independent measure of overall shooting efficiency by accounting for the added value of three-point field goals. The metric is calculated as: $eFG = (FGM + 0.5 \times 3PM) / FGA$. This formula incorporates two and three-point field goals into a single measure, offering a comprehensive assessment of a team's shooting effectiveness
Offensive Rating (OFF RTG)	It captures the ability of a team to score each time they get the ball and estimates the points made by a team based on 100 possessions. The formula is as follows: $OFF\ RTG = PTS / POSS \times 100$

Statistical analysis

No missing values were observed, and the data were retained without transformations. Summary statistics (mean and standard deviation, $M \pm SD$) were calculated for all variables to provide an overview of the dataset. The Shapiro-Wilk test assessed the normality assumption and indicated a non-normal distribution for the examined variables. The Mann-Whitney U test was used to evaluate differences in the examined variables between the winning and losing teams. The rank biserial correlation (r) measured the effect size between assist-related parameters and game outcomes ($r < .30$ = small effect, r between .30 and .50 = medium effect, $r > .50$ = large effect, Cohen, 1988). In addition, Spearman's rank-order correlation analyzed the strength and direction of associations between assist-related variables and offensive efficiency. To prevent multicollinearity, a multiple regression analysis was performed and covariates with Variance Inflation Factors (VIF) > 5 were flagged as potentially redundant and removed from the analysis (Akinwande et al., 2015). The correlation incorporated five variables and the WIN%. All statistical analyses were conducted with JASP (version 0.19, University of Amsterdam, The Netherlands). Statistical significance was set at $p < .05$.

Results

The Mann-Whitney U test revealed significant differences between winning and losing teams in multiple indicators of offensive performance related to AST (Table 2).

Table 2. Comparison of Performance Variables Between Winning and Losing Teams

Variable	Winning Teams (M ± SD)	Losing Teams (M ± SD)	U	p	r
Assists	19.53±4.39	17.085±3.83	17.085	<.001	.32
Assist Ratio (%)	23.6±5.40	20.6±4.80	17.006	<.001	.32
Assisted Points Ratio (%)	50.46±9.30	48.66±10.00	22.487	.057	.10
Assist/Turnover Ratio	1.86±0.93	1.41±0.49	16.321.50	<.001	.35
eFG%	58.6±7.20	51.7±7.00	12.142.50	<.001	.52
Offensive Rating	123.4±11.38	108.53±11.20	8.605	<.001	.66

Note. M=mean; SD=standard deviation; U=Mann-Whitney U statistic; r=rank-biserial correlation.

The winning teams recorded significantly more AST ($U=17.085$, $p<.001$), with a medium effect size ($r=.32$). Similarly, the AST/TO Ratio was significantly higher in winning teams compared to losing teams ($U=16.321.50$, $p<.001$, $r=.35$), indicating more efficient ball management. Additionally, the AST Ratio was significantly higher for winning teams than for losing teams ($U=17.006$, $p<.001$, $r=.32$), while APR marginally did not show a statistically significant difference between winning and losing teams ($p=.057$).

Performance-based metrics further distinguished the two groups. The winning teams had significantly higher eFG% than losing teams, with a large effect size ($U=12.142.50$, $p<.001$, $r=.52$). Additionally, OFFRTG was significantly better among winning teams ($U=8.605$, $p<.001$), indicating a large effect size ($r=.66$).

Spearman's rank-order correlation analysis was also performed to examine the relationships between assist-related variables, offensive performance metrics, and winning outcomes in EuroLeague games (Figure 1). The analysis showed a strong positive correlation between AST/TO and OFFRTG ($\rho=.565$, $p<.001$), indicating that teams with higher assists relative to turnovers tend to perform better offensively. Similarly, the AST Ratio was positively associated with OFFRTG ($\rho=.495$, $p<.001$), as was the APR ($\rho=.129$, $p<.01$). Regarding the association of eFG% and assist-related metrics, AST Ratio exhibited a strong correlation ($\rho=.602$, $p<.001$), while AST/TO and APR demonstrated a moderate positive relationship with eFG% ($\rho=.315$ and $\rho=.291$, $p<.001$, respectively).

Furthermore, eFG% showed a very strong positive correlation with OFFRTG ($\rho=.794$, $p<.001$), confirming that shooting efficiency plays a significant role in a team's scoring ability. Concerning winning outcomes, OFFRTG displayed a moderate positive correlation with WIN% ($\rho=.227$, $p<.001$), indicating its important role in differentiating successful teams. Although AST/TO and the AST Ratio were positively correlated with WIN% ($\rho=.177$, $p<.001$ and $\rho=.094$, $p<.05$, respectively), these associations were weaker (Figure 1).

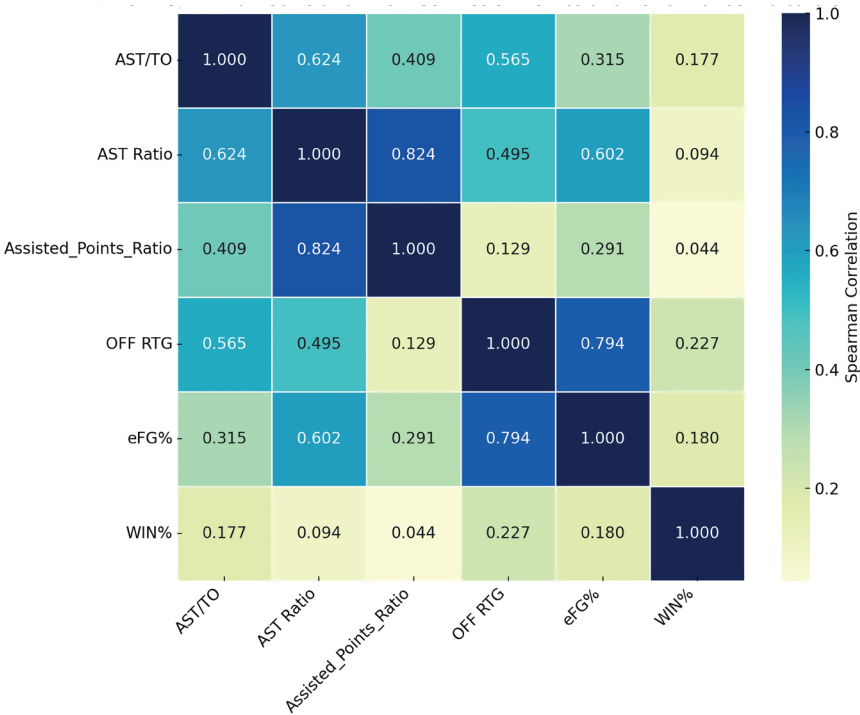


Figure 1. Spearman correlation matrix showing the relationships between assist-related metrics and performance indicators in EuroLeague games.

Discussion

This study examined how assist-related metrics contribute to offensive efficiency and distinguish between winning and losing teams in EuroLeague basketball. The findings strongly indicate that advanced statistics related to ASTs, rather than just the number of ASTs, are more reliable predictors of offensive success and competitive outcomes, supporting the growing view in performance analysis that suggests predicting outcomes in elite basketball relies more on metrics adjusted by possession than on simple statistics.

In support of earlier research on the importance of playmaking in elite basketball (Liang et al., 2025; Plakias et al., 2024; Turner & Franks, 2021), winning teams showed significantly higher values in AST and AST/TO Ratio compared to losing teams. The moderate effect sizes observed for AST and the AST Ratio, with a stronger effect for AST/TO, emphasize that creating scoring opportunities is key, but doing so while minimizing turnovers is equally vital. This supports the idea that efficient playmaking, indicated by the AST/TO balance, is a more meaningful measure of team quality than total assists alone (Plakias et al., 2024). More assists generally lead to more field goals made, while fewer turnovers lead to more field goals attempted and fewer points lost from turnovers. This aligns with emerging evidence suggesting that isolated AST metrics can be misleading without considering context-specific factors such as turnover risk, shot selection, and possession quality (Skinner, 2010).

Although the APR did not reach statistical significance between winning and losing teams ($p=.057$), it was close to the traditional threshold, indicating a possible trend toward higher values among winning teams. This nearly significant result suggests that the proportion of points generated through assists may influence offensive effectiveness, though its impact appears less consistent than other assist-related metrics, such as AST/TO or AST Ratio. One reason could be that APR reflects the outcome of assisted scoring rather than the efficiency of ball movement, making it more affected by contextual factors like shooting accuracy, shot selection, and offensive structure. Additionally, the medium effect size suggests that while assisted scoring is relevant, it may not alone distinguish team success at the elite level. These findings highlight the need for further research on APR alongside other performance indicators and larger samples to better understand its role in offensive performance.

The results also confirmed the crucial role of offensive efficiency in winning games. eFG% and OFFRTG were notably higher among winning teams, indicating a strong effect size. These results align with previous research (McKim et al., 2023; Mandić et al., 2019), which identified eFG% and OFFRTG as key performance indicators. These metrics were closely linked, suggesting that accurate and high-value shot selection, especially from three-point range, is essential for effective scoring (Foteinakis & Pavlidou, 2024; Gkotsis, 2024; Çene, 2018). EuroLeague teams prioritize good ball movement and creating open shot opportunities to improve overall shot quality and offensive efficiency, with offensive possessions characterized by patience and precision, often taking shots later in the shot clock (Karamousalidis et al., 2025). This aligns with the findings of Foteinakis, Pavlidou, and Stavropoulos (2024), who reported that EuroLeague offenses are typically built on structured, team-oriented strategies that favor collective execution over individual shot creation, resulting in higher scoring efficiency, a process directly reflected in the elevated AST metrics of winning teams in this study.

Although both AST/TO and AST Ratio showed positive correlations with WIN%, these relationships were weaker than the correlation of OFFRTG with WIN%. Although correlation does not imply causation, this pattern emphasizes that AST efficiency helps enable broader offensive success rather than directly determining game outcomes. These findings support earlier research (Cabarkapa et al., 2024; Özmen, 2016; Ziv et al., 2010), indicating that efficient passing and fewer turnovers lead to more effective offenses, which in turn increase the chances of winning. However, the weaker links between AST metrics and WIN% highlight the complexity of predicting victory, as it also depends on defensive and game context factors not examined here.

From a practical point of view, these findings highlight the strategic importance of improving assist efficiency through tactical design, such as optimizing spacing, shot opportunities, and decision-making under pressure. Coaches can benefit from fostering a team culture that emphasizes effective ball movement, which has been proven essential, especially in critical game situations (Foteinakis & Pavlidou, 2024). Additionally, we recommend using AST/TO as the most influential metric to assess the value of ball movement. Employing the AST/TO ratio provides a more accurate reflection than simply counting assists or points created per game because some teams prioritize offense while others focus on defense, making comparisons across different play styles potentially misleading. While this study provides significant information, it does not account for contextual factors such as player roles, opponent strength, shot quality, and defensive coverages. Furthermore, the current analysis focuses solely on regular-season data, which may restrict generalizability to playoff or high-pressure contexts where tactical behaviors may differ. Extending the research to playoff games could potentially offer deeper insights into assist-related metrics under increased pressure. Future research could also explore AST-related metrics across various play types (pick-and-

roll, isolation, etc.) or during clutch moments. Additionally, integrating players' position tracking data could lead to a better understanding of assist creation and conversion efficiency.

Conclusions

Exploring AST metrics in EuroLeague basketball revealed significant findings that impact offensive efficiency and game outcomes. Particularly, the AST/TO ratio appeared as a key contributor to offensive output and, to a lesser extent, to winning outcomes in elite-level basketball. The winning teams demonstrated a more effective assist distribution, thereby enhancing offensive efficiency and illustrating the critical role of teamwork in achieving game success. The observed differences in the AST/TO ratio and assist efficiency between winning and losing teams suggest that traditional measures, such as the raw number of assists, are no longer sufficient to explain performance outcomes. Modern basketball analytics is therefore moving toward efficiency-driven indicators, which provide a more accurate reflection of team effectiveness and decision-making in elite competition. Meanwhile, offensive efficiency, as represented by eFG% and OFFRTG, remained the most important factor linked to successful outcomes. Data-driven analyses can guide coaches in optimizing team collaborations and identifying assist patterns, resulting in strategic adjustments during the season. These findings can help coaches and team analysts develop strong coaching strategies, highlighting the importance of communication and disciplined tactical execution, which are essential factors for enhancing performance in elite basketball environments.

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