

OPTIMIZING DECISION-MAKING THROUGH GAME THEORY MODEL ANALYSIS

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ABSTRACT

This research leverages game-theoretical models to explore the key factors influencing a high school basketball team's chance of winning. We examine the effects of shooting percentage, free throw rate, and defensive intensity including defensive rebounds, steals, and block on game outcomes, uncovering novel insights. Our findings indicate that when a team has a high shooting percentage, it is motivated to take more shots. However, in high-pressure games—where competition is fierce and defensive intensity increases—both teams should reduce shot attempts and focus on improving shooting efficiency. Additionally, a high free throw rate incentivizes players to draw more fouls and capitalize on free throws for efficient scoring. By analyzing various scenarios, we find that while both shooting percentage and free throw percentage significantly influence game outcomes, shooting efficiency (successful shots) has the greatest impact on a team's chances of winning. However, the free throw rate remains a crucial complementary factor that enhances overall performance. Furthermore, as competition intensity increases, the score gap between the two teams tends to narrow. These insights provide valuable guidance for coaches, players, and analysts in refining team strategies and decision-making to enhance performance.

Keywords: *Sports management; Basketball; Game competition; Analysis; Game theory*

INTRODUCTION

Basketball is a cornerstone of American culture, symbolizing teamwork, resilience, and community. In high school, basketball goes beyond just a sport—it's a source of pride and identity for schools, with winning games, conference titles, and championship brackets bringing recognition and glory to both players and their institutions. These victories can create lasting legacies and unite students, faculty, and local communities in celebration. Basketball is a highly dynamic sport where a team's success depends on a combination of skill, strategy, and adaptability to game conditions. In basketball, teams that can adjust to varying game conditions—such as the opposing team's defense or game tempo—perform better and are more likely to win. Several key factors influence a team's likelihood of winning, including shooting rate, free throw efficiency, and the intensity of competition. For example, teams with higher shooting rates may increase their chances of scoring, but excessive shot attempts without a focus on accuracy can lead to inefficiency (Li et al., 2025). A study by Basketball Reference found that

teams that take fewer, higher-quality shots (e.g., three-pointers with a high percentage or close-range shots) tend to have a higher offensive rating. Teams focusing on shooting efficiency rather than volume had a 10% better chance of scoring, compared to teams with high shot attempts but low accuracy. A study by the NBA found that teams with a higher field goal percentage (above 45%) are significantly more likely to win, but teams with excessive shot attempts and lower shooting percentages (under 40%) often struggle to close games. In fact, NBA teams shooting below 40% on high-volume shots lose 70% of the time.

Previous studies such as Sutiono et al. (2015), Ruano et al. (2015), and Kostacos (2023) have primarily examined the impact of shooting rates on basketball victories but did not address the influence of competition intensity. Competition intensity—such as strong defensive pressure—is another critical component that forces teams to adjust their shooting strategies, affecting both shot selection and team’s overall performance (Zhang et al., 2020). Previous study (Karipidis et al., 2001) empirically ever addressed the impact of defensive rebounds and shooting rate on game’s winning. However, free throw efficiency also plays a crucial role—teams that maximize free throw opportunities often gain a competitive advantage, particularly in close games (Goldschmied et al., 2022).

Some previous studies (Csataljay et al., 2017; Chen et al., 2025) empirically analyzed how shooting rate, free throw rate, and defensive rebounds influence the game’s winning. However, the optimal balance between shot attempts, successful shots, and fouls in response to defensive intensity - beyond just defensive rebounds - remains an open question in basketball analytics. Rather than empirical analysis, my research takes a different approach, focusing on mathematical model analysis to understand the game's dynamics and optimize the decisions. Teams must constantly adjust their shooting strategies based on in-game factors, making it essential to develop models to make optimal decisions. Despite extensive research on basketball performance metrics, prior studies have not fully explored the following critical questions: How do shooting rate, free throw rate, and defensive intensity interact to determine a team’s success? How do teams respond to competition intensity in high-pressure games?

In this research, we examine the high school basketball team’s strategic decision-making process in the game competition. Our study addresses the following key questions:

1. How do shooting rate, free throw rate, and competition intensity impact a team’s likelihood of winning in high school basketball games?
2. How does a high shooting rate influence a team’s decision on shot attempts during a game?
3. What role does competition intensity—such as strong defensive pressure—play in determining a team’s shooting strategy and success?
4. How does free throw efficiency affect a team’s overall scoring strategy and likelihood of winning?
5. What is the optimal balance between shot attempts, successful shots, and fouls to maximize a team’s performance in different game scenarios?
6. Can game theoretical models effectively simulate and predict strategic decisions made by teams in high-pressure games?

To answer these questions, we employ game-theoretical models, specifically using the Bertrand Model as a framework. Traditionally applied to economic competition, the Bertrand Model describes price competition between firms in a duopoly. In the context of basketball games, this model allows us to analyze how teams make decisions on their shooting strategies in response to game situations such as foul free throws and competition intensity. Specifically, teams need to consider (a) how shots should be attempted by considering shot accuracy, (b) when to focus on drawing fouls to capitalize on free throw opportunities, and (c) how defensive intensity should be adopted.

We analyze four key factors in our research: (1) the impact of the shooting rate on shot attempts; (2) the influence of game competition intensity on shot selection; (3) the relationship between free throw success rate and foul-drawing tendencies; and (4) the relative importance of shooting accuracy versus free throw efficiency in determining game outcomes. By evaluating these scenarios, we investigate (a) how teams adjust their shot selection based on shooting accuracy; (b) the optimal strategy under defensive pressure; and (c) whether a high free throw rate can compensate for a lower shooting percentage.

In sum, our paper is the first to apply game theoretical models to high school basketball strategies that not only examine shooting accuracy but also free throw rates and defensive intensity and how they influence a team's decision-making and overall success. Additionally, our paper presents several key findings: (1) A single optimization strategy—such as increasing shot attempts—may not always yield better results, as defensive intensity can shift the focus toward shooting efficiency rather than volume; however, (2) a combined strategy that balances high-percentage shooting with efficient free throw utilization consistently produces the best competitive advantage, maximizing scoring potential while adapting to defensive pressure.

RESEARCH MODEL AND ANALYSIS

We here assume that a basketball game consists of two competing teams, each making strategic decisions based on shooting accuracy, defensive intensity, and free throw efficiency. We summarize the research motivation, methodology, and results in Table 1.

Table 1. Research motivation, methodology, and results

Research Motivation	Methodology	Results
<p>Basketball is deeply embedded in American culture, representing teamwork, resilience, and community. At the high school level, it is more than just a sport—it serves as a source of pride and identity, with victories in games, conference titles, and championships bringing recognition to both players and their schools. These achievements create lasting legacies and foster unity among students, faculty, and local communities. This research examines the key factors that impact a high school basketball team’s likelihood of winning.</p>	<p>Using mathematical models from game theory, we present a novel evaluation of how shooting percentage, competition intensity, and free throw rate influence game outcomes, yielding new insights.</p>	<p>Our results indicate that when a team has a high shooting percentage, it is more inclined to take additional shot attempts. In high-pressure games—where competition is fierce and defensive intensity rises—both teams tend to reduce their shot attempts and prioritize improving their shooting efficiency. Additionally, when the free throw rate is high, players are incentivized to draw more fouls and capitalize on free throws for efficient scoring. By analyzing various game scenarios, our study concludes that while both shooting percentage and free throw percentage contribute significantly to a team's success, shooting efficiency (successful shots) has the greatest impact on winning. Nonetheless, the free throw rate remains a crucial complementary factor that enhances overall performance and success.</p>

In this research, we focus on analyzing the following factors:

- (1) The impact of a high shooting rate on shot attempts.
- (2) The influence of game competition intensity on shot selection.
- (3) The relationship between free throw success rate and foul-drawing tendencies.
- (4) The relative importance of shooting accuracy versus free throw efficiency in determining game outcomes.

Specifically, we have the procedures in sequence as follows:

First, we investigate if it is beneficial for a team to increase shot attempts when its shooting accuracy is high. Our results show that teams are incentivized to take more shots when their shooting percentage increases, as it leads to higher scoring opportunities.

Second, we examine how intense game competition affects shoot attempts. Our results reveal that as defensive pressure increases, teams should prioritize shot quality over quantity, reducing their total shot attempts to focus on efficiency.

Third, we investigate whether drawing more fouls and increasing free throw attempts is a viable strategy for scoring. Our results demonstrate that while a high free throw rate provides a reliable scoring method, relying too heavily on free throws can lead to fewer total shoot opportunities. This creates a strategic trade-off between shot attempts and free throw efficiency.

Fourth, we examine the combined impact of shooting accuracy and free throw reliance on overall game outcomes. Our analysis suggests that while both factors play crucial roles in determining a team's success, shooting accuracy has a more significant impact on winning. Teams with higher shooting percentages tend to secure victories more consistently, as their efficiency minimizes wasted possessions. However, free throws act as a complementary strategy, particularly in tightly contested games, where drawing fouls can provide a crucial advantage. This scenario highlights the importance of balancing shot attempts, efficiency, and foul-drawing tactics to develop a well-rounded game plan that maximizes scoring opportunities.

All notations used in this research are listed in Table 2.

Table 2. Notations used in our analytical models

Notations	Definitions
$g_i (i = 1,2)$ $(0 < g_i < 1)$	Team's potential successful shots
$T_i (i = 1,2)$	Team's potential total shots including free throws
$c (0 < c < 0.5)$	The intensity of game competition driven by factors such as high energy, defensive pressure, and strategic play.
$a_i (i = 1,2) (0 < a_i < 1)$	The free throw success rate
$D_i (i = 1,2)$	The win percentage
$R_i (i = 1,2)$	Team's total score

Higher success rates in free throws and shots increase a team's chances of winning. However, the opposing team's improved shooting accuracy adds pressure, often reducing the other team's performance and chances of success. Thus, we have

$$D_1 = a_1 + p_1 - cp_2 \quad (1)$$

$$D_2 = a_2 + p_2 - cp_1 \quad (2)$$

Building on the model development approach used by Sutiono et al. (2015), we define the successful shooting rate function as follows:

$$p_i = \sqrt{\frac{g_i}{T_i}}, (i = 1,2) \quad (3)$$

The winning team is determined by the final score. When two teams have an equal probability of winning, the team with a higher number of successful shots will secure a higher score (i.e., more points) and emerge as the game-winner. Therefore, we have:

$$R_1 = T_1 D_1 \quad (4)$$

$$R_2 = T_2 D_2 \quad (5)$$

Given the above equations (4) and (5), we take the derivative of R_1 on T_1 and R_2 on T_2 , respectively, then we obtain $\frac{\partial R_1}{\partial T_1} = T_1(a_1 + \sqrt{\frac{g_1}{T_1}} - c\sqrt{\frac{g_2}{T_2}})$ and $\frac{\partial R_2}{\partial T_2} = T_2(a_2 - c\sqrt{\frac{g_1}{T_1}} + \sqrt{\frac{g_2}{T_2}})$. Letting $\frac{\partial R_1}{\partial T_1} = T_1(a_1 + \sqrt{\frac{g_1}{T_1}} - c\sqrt{\frac{g_2}{T_2}}) = 0$ and $\frac{\partial R_2}{\partial T_2} = T_2(a_2 - c\sqrt{\frac{g_1}{T_1}} + \sqrt{\frac{g_2}{T_2}}) = 0$, then we have $T_1 = \frac{(1-4c^2)^2 g_1}{4(a_1+2a_2c)^2}$ and $T_2 = \frac{(1-4c^2)^2 g_2}{4(a_2+2a_1c)^2}$.

First, by taking the derivative of $T_1 = \frac{(1-4c^2)^2 g_1}{4(a_1+2a_2c)^2}$ on g_1 and $T_2 = \frac{(1-4c^2)^2 g_2}{4(a_2+2a_1c)^2}$ on g_2 , respectively, we obtain $\frac{\partial T_1}{\partial g_1} = \frac{(1-4c^2)^2}{4(a_1+2a_2c)^2} > 0$ and $\frac{\partial T_2}{\partial g_2} = \frac{(1-4c^2)^2}{4(a_2+2a_1c)^2} > 0$. Thus, we have proposition 1 below.

Proposition 1: *When a team has a high shooting percentage, it is motivated to attempt more shots.*

Proposition 1 shows that a high shooting percentage reflects a team's ability to make shots at an efficient rate, which, in turn, boosts players' confidence. As a result, they are more likely to take additional shot attempts, believing their efforts are paying off. Psychologically, success in making shots creates a feedback loop of motivation—players feel rewarded for their accuracy, encouraging them to be more aggressive in seeking scoring opportunities. Coaches can capitalize on this momentum by promoting an aggressive offense, creating more scoring opportunities for in-form players while ensuring shot selection remains efficient. While confidence is beneficial, teams must balance increased shot volume with high-quality attempts to avoid reckless or inefficient play. Additionally, leveraging early-game success can provide a psychological edge in close games by setting the tone and building momentum, reinforcing the motivation cycle that drives offensive aggressiveness.

We use Figures 1 and 2 to illustrate the effect of successful shots on total shoots. The values we use in our simulations are given as $a_1 = 0.2$, $a_2 = 0.3$, $c = 0.3$, $0 < g_i < 0.6$. Figures 1 and 2 demonstrate that the number of total shots has a positive relationship with the number of successful shots, which verifies the result derived in proposition 1. In other words, a higher successful shooting rate will motivate the team to make more shots.

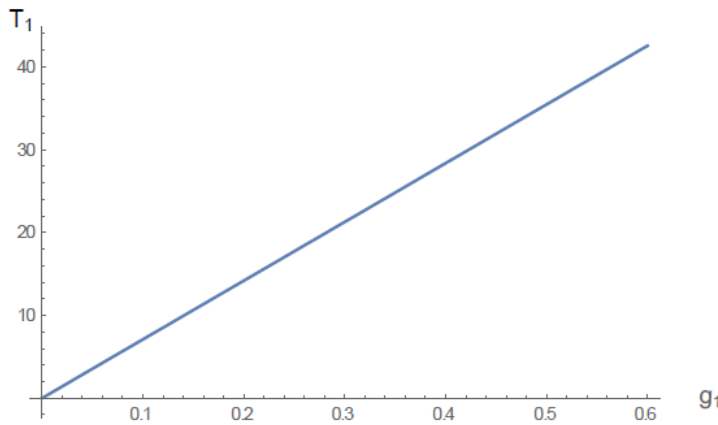


Figure 1. The effect of shooting rate on team 1’s shot attempts

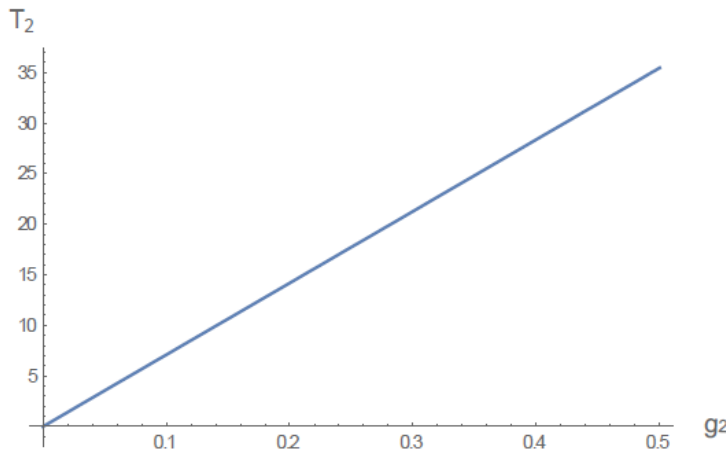


Figure 2. The effect of shooting rate on team 2’s shot attempts

Next, by taking the derivative of $T_1 = \frac{(1-4c^2)^2 g_1}{4(a_1+2a_2c)^2}$ on c and $T_2 = \frac{(1-4c^2)^2 g_2}{4(a_2+2a_1c)^2}$ on c , respectively, we obtain $\frac{\partial T_1}{\partial c} = \frac{(-1+4c^2)(a_2+4a_1c+4a_2c^2)g_1}{(a_1+2a_2c)^3} < 0$ and $\frac{\partial T_2}{\partial c} = \frac{(-1+4c^2)(a_1+4a_2c+4a_1c^2)g_2}{(a_1+2a_2c)^3} < 0$. Thus, we have the proposition 2 below.

Proposition 2: *When game competition is stronger, both teams should reduce their shot attempts and focus on improving the shooting rate.*

Proposition 2 shows that when the level of competition in a game intensifies, both teams should prioritize improving their shooting efficiency rather than increasing their shot attempts. When game competition is stronger, teams often face stiffer defensive pressure, making shot attempts more difficult and less efficient. In these situations, shooting efficiency becomes

crucial, and teams may benefit more from focusing on high-quality shot attempts rather than increasing the volume of shots. A higher focus on accuracy ensures that each shot has a better chance of going in, which is critical in tight games where scoring opportunities are limited. Strong competition often forces teams to play at a more strategic pace, rather than relying on sheer volume of attempts. By reducing shot attempts and emphasizing shooting quality, teams can improve their chances of scoring, making each shot more valuable. Additionally, reducing rushed or poor-quality shots can help preserve possession and limit turnovers, which are especially damaging against tough opponents. To further enhance performance, coaches should focus on shot selection by encouraging players to take high-percentage shots when they have a clear advantage. Emphasizing team play and ball movement ensures that shots are well-timed and well-positioned, minimizing forced attempts. Improving individual shooting skills, managing game pace, and maintaining composure under pressure are all critical for maximizing scoring opportunities and achieving success in high-stakes matchups.

We use Figures 3 and 4 to illustrate the effect of the degree of game competition on total shots. The values we use in our simulations are given as $a_1 = 0.4$, $a_2 = 0.35$, $g_1 = 0.3$, $g_2 = 0.25$, and $0 < c < 0.35$. Figures 3 and 4 demonstrate that the number of total shots has a negative relationship with the degree of game competition, which verifies the result derived in proposition 2. In other words, higher game competition due to pressure defense and others makes the competing teams focus on the successful shooting rate, not on the number of shots.

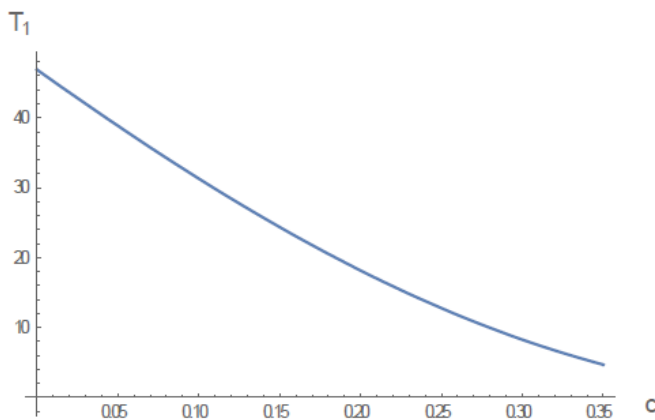


Figure 3. The effect of the intensity of game competition on team 1's shot attempts

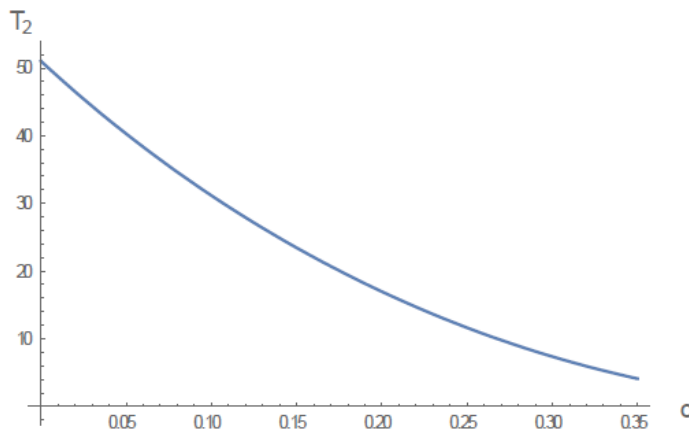


Figure 4. The effect of the intensity of game competition on team 2's shot attempts

Third, by taking the derivative of $T_1 = \frac{(1-4c^2)^2 g_1}{4(a_1+2a_2c)^2}$ on a_1 and $T_2 = \frac{(1-4c^2)^2 g_2}{4(a_2+2a_1c)^2}$ on a_2 , respectively, we obtain $\frac{\partial T_1}{\partial a_1} = -\frac{(1-4c^2)^2 g_1}{2(a_1+2a_2c)^3} < 0$ and $\frac{\partial T_2}{\partial a_2} = -\frac{(1-4c^2)^2 g_2}{2(a_2+2a_1c)^3} < 0$. Thus, we have the proposition 3 below.

Proposition 3: *When the free throw rate is high, the number of shots is reduced due to increased fouls from the opposing team.*

Proposition 3 shows that when the free throw rate is high, the number of field goal attempts may be reduced due to increased fouls committed by the opposing team. As teams draw more fouls, they are awarded free throw opportunities, which can lower the total number of field goals attempted during the game. High free throw rates often indicate that players are getting to the line frequently, either through aggressive play or the opposing team's defensive mistakes. In these situations, teams can capitalize on free throws to maintain scoring efficiency without the need to increase their shot attempts. By focusing on getting to the line and converting free throws, teams can accumulate points while reducing the risk of forced or inefficient field goal attempts. Additionally, a high free throw rate can disrupt the flow of the opposing team's defense, as frequent fouls may force key players into foul trouble, limiting their effectiveness and playing time. To maximize these opportunities, coaches should adjust their offensive strategy to encourage aggressive attacks to the basket, which can draw more fouls and increase free throw chances. Controlling the tempo of the game is also critical, as slowing down the pace can reduce turnovers and help teams manage foul risks more effectively. Ensuring free throw efficiency is vital, so players should be well-trained in free throw shooting, especially under pressure, to make the most of these opportunities. Lastly, maintaining mental focus in high-pressure situations will be crucial, as players should stay composed and take advantage of foul-drawing opportunities, particularly when free throws can play a decisive role in the game.

We use Figures 5 and 6 to illustrate the effect of the free throw rate on total shots. The values we use in our simulations are given as $c = 0.35$, $g_1 = 0.3$, $g_2 = 0.3$, $0 < a_1 < 0.3$, and $0 < a_2 < 0.35$. Figures 5 and 6 demonstrate that the total shots have a negative relationship with the free throw rate, which verifies the result derived in proposition 3. In other words, a higher free throw success rate encourages players to attempt more free throws, leading to increased fouls by the opposing team and, consequently, fewer shot opportunities.

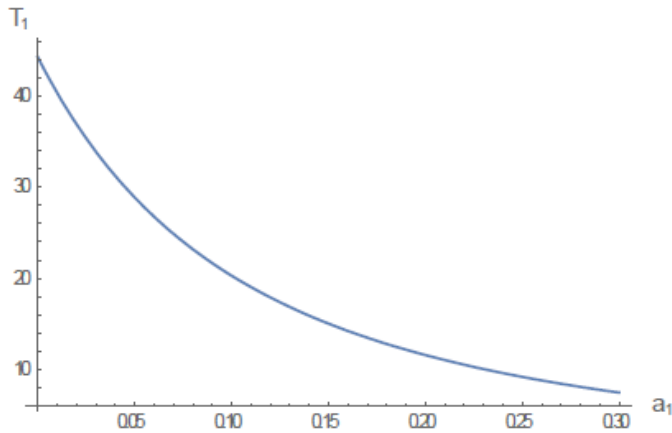


Figure 5. The effect of free throw rate on team 1’s shot attempts

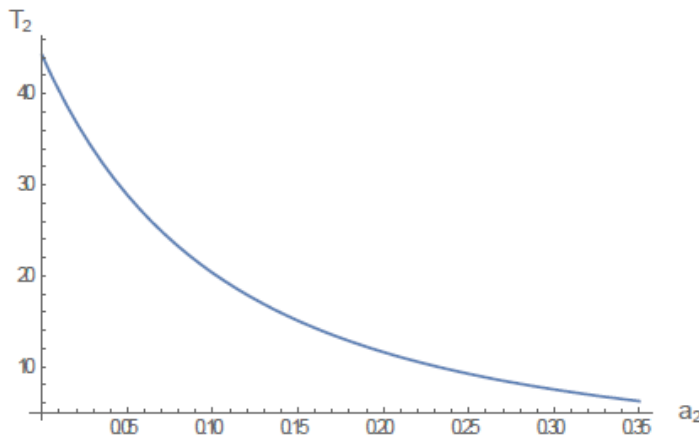


Figure 6. The effect of free throw rate on team 2’s shot attempts

Finally, by comparing $R_1 = \frac{(1-4c^2)^2(a_1 - 2c\frac{(a_2+2a_1c)}{(1-4c^2)} + 2\frac{(a_1+2a_2c)}{(1-4c^2)})g_1}{4(a_1+2a_2c)^2}$ with $R_2 = \frac{(1-4c^2)^2(a_2 + 2\frac{(a_2+2a_1c)}{(1-4c^2)} - 2c\frac{(a_1+2a_2c)}{(1-4c^2)})g_2}{4(a_2+2a_1c)^2}$, we have the proposition 4 below.

Proposition 4: *Although both the shooting rate and free throw rates influence a team's chances of winning, the impact of a successful shooting rate is greater. Additionally, as the intensity of a game increases, the score difference between the two teams tends to decrease.*

Proposition 4 shows that the shooting rate has a greater impact on a team's chances of winning because it directly influences the flow of the game by generating points during regular play. Field goals, especially three-pointers, can significantly increase a team's offensive output and provide momentum shifts, making them more valuable over time. A successful shooting rate contributes not only to scoring but also to maintaining offensive efficiency and the overall rhythm of the game. On the other hand, while free throw rates contribute to scoring, fouls typically arise in specific situations and are often influenced by factors such as the opposing team's defense or referee decisions. While important, free throws generally don't carry the same offensive momentum as successful field goals do. Therefore, a high shooting percentage tends to have a more substantial and sustained impact on a team's ability to control the game and increase their chances of winning. As the intensity of a game increases—often due to factors like heightened competition, playoff settings, or close game situations—the score difference between the teams tends to decrease because teams tighten up defensively, and mistakes become more costly. When the pressure is higher, both teams may focus more on preventing scoring than on scoring themselves. Additionally, with the game being more contested, teams are less likely to give up large runs or open shooting opportunities, leading to a smaller margin of victory. This is particularly true in situations where teams engage in tight defensive schemes and capitalize on fewer, more crucial scoring opportunities. In such high-pressure situations, coaches should prioritize improving shooting efficiency, ensuring that players focus on high-percentage shots to maintain consistency and confidence. Maximizing offensive spacing and ball movement can create open shot opportunities, leading to higher shooting percentages, while players should focus on high-percentage shots. Free throw efficiency remains important, and coaches should ensure players are proficient at the line, especially during critical moments, while developing strategies to draw fouls. As game intensity increases and the score difference narrows, coaches must maintain composure and focus, ensuring players avoid overreacting to adversity.

We use Figure 7 to illustrate the results derived in proposition 4. The values we use in our simulations are given as $g_1 = 0.31$, $g_2 = 0.32$, $a_1 = 0.7$, $a_2 = 0.35$, and $0 < c < 0.35$. Figure 7 demonstrates that although the free throw rate of team 1 is two times that of team 2, and the shooting rate of team 2 is only 0.01 higher than that of team 1, team 2 still is the game-winner. In other words, a successful shooting rate is more important during the game competition, but the free throw rate can be used as a complementary means to help a team win.

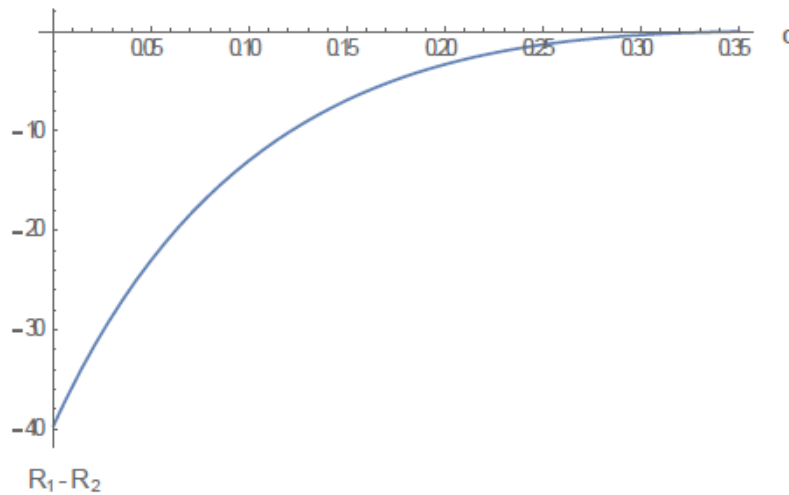


Figure 7. Two teams' score difference

CONCLUSIONS AND MANAGERIAL IMPLICATIONS

Basketball is one of the most influential and beloved sports in the United States. It plays a crucial role in American culture, sports history, and the economy. This study has explored the critical factors that influence a basketball team's chances of winning, with a particular emphasis on shooting efficiency, free throw rates, and the dynamics that arise as the intensity of the game increases. By analyzing the direct and indirect impacts of these elements on game outcomes, we have seen that a successful shooting rate - particularly in field goals - holds a significantly greater weight in determining a team's success compared to free throw rates. A high shooting percentage not only contributes to scoring but also shapes the overall pace and rhythm of the game, fostering momentum shifts that can sway the outcome in favor of the team with superior shooting efficiency. The role of free throws, while still important, was shown to be less influential in terms of maintaining offensive momentum. Free throw opportunities arise in specific situations and often depend on the defensive strategy of the opposing team or officiating decisions. Although free throws can be critical in crucial moments, their ability to sustain an offensive surge or dictate the flow of the game is limited compared to the more consistent and dynamic impact of high-quality field goals. Additionally, the research revealed that as the intensity of a game increases, such as during high-stakes matchups, playoffs, or tightly contested games, the score gap tends to narrow due to increased defensive pressure and a reduction in scoring opportunities. This heightened competition forces teams to become more strategic, focusing on creating efficient scoring chances while tightening their defense. Coaches and managers, therefore, must adjust their strategies, accordingly, emphasizing the importance of shooting efficiency, effective offensive spacing, and the ability to maintain composure in high-pressure situations. It becomes clear that in these high-stress moments, the team that can execute with greater consistency, minimize mistakes, and capitalize on crucial scoring opportunities is more likely to prevail. We summarize these results in Table 3.

Table 3. Summarized results

Result 1	When a team has a high shooting percentage, it is motivated to attempt more shots.
Result 2	When the competition is tougher, both teams should focus on reducing shot attempts and improving their shooting efficiency.
Result 3	When the free throw rate is high, the number of shot attempts decreases due to more fouls committed by the opposing team.
Result 4	While both shooting and free throw percentages impact a team's chances of winning, the effect of a high shooting percentage is more significant. Furthermore, as the game's intensity increases, the point difference between the teams typically narrows.

Considering these findings, the managerial implications are clear.

First, coaches and team managers should encourage players to maintain a high shooting percentage, as this not only improves overall scoring efficiency but also boosts player confidence and motivation to take more shots. By fostering an environment where players feel successful in their shooting, teams can capitalize on this momentum to increase their offensive output.

Second, in high-stakes or intense games, coaches should emphasize the importance of shot selection and efficiency. Teams should focus on reducing unnecessary shot attempts and prioritize quality over quantity, ensuring that each shot taken has a higher chance of success. This approach helps conserve energy, minimizes turnovers, and increases the likelihood of securing a win in competitive matchups.

Third, coaches should leverage a high free throw rate to their advantage by encouraging players to drive to the basket and draw fouls from the opposing team. With more fouls committed, the team can reduce the need for field goal attempts while capitalizing on free throws to maintain scoring efficiency. This strategy can help control the tempo of the game and limit the opposing team's ability to defend aggressively.

Fourth, coaches should prioritize improving their team's shooting efficiency, as a high shooting percentage has a greater impact on winning chances. In high-pressure games, where the competition intensifies, the score gap tends to shrink, making each possession even more critical. Therefore, teams should focus on maintaining composure and executing high-quality shots, especially in crucial moments, to secure a competitive edge and close out tight games.

In sum, this research underscores the importance of a balanced approach to both offensive and defensive strategy, with a particular emphasis on shooting efficiency as the cornerstone of a winning game plan. As basketball continues to evolve, teams that focus on refining their shooting skills and adapting their strategies to the flow of the game will be better positioned to succeed in increasingly competitive environments.

REFERENCES

- Chen, R., Zhang, M., Xu, X., & Liu, Y. (2025). Game-related statistics for distinguishing winning and losing teams in Olympic basketball: The impact of game pace. *Journal of Sports Sciences*, 1–12. <https://doi.org/10.1080/02640414.2024.2448360>
- Goldschmied, N., Raphaeli, M., Moothart, S., & Furley, P. (2022). Free throw shooting performance under pressure: a social psychology critical review of research. *International Journal of Sport and Exercise Psychology*, 20(5), 1397-1415. <https://doi.org/10.1080/1612197X.2021.1979073>
- Csataljay, G., O'Donoghue, P., Hughes, M., & Dancs, H. (2009). Performance indicators that distinguish winning and losing teams in basketball. *International Journal of Performance Analysis in Sport*, 9(1), 60–66. <https://doi.org/10.1080/24748668.2009.11868464>
- Gómez, M. A., Alarcón, F., & Ortega, E. (2015). Analysis of shooting effectiveness in elite basketball according to match status [Performance analysis]. *Revista De Psicología Del Deporte*, 24(1), 37–41. <https://www.redalyc.org/pdf/2351/235143644008.pdf>
- Karipidis, A., Foteinakis, P., Taxildaris, K., & Fatouros, J. (2001). Factors characterizing a successful performance in basketball. *Journal of Human Movement Studies*, 41(5), 385–397. https://www.researchgate.net/profile/Panagiotis-Foteinakis/publication/287814881_Factors_characterizing_a_successful_performance_in_basketball/links/67478d4b876bd17778297832/Factors-characterizing-a-successful-performance-in-basketball.pdf
- Kostacos, S. (2023). Effect of increased three-point shot attempts on probability of winning in high school basketball. *Wharton Sports Analytics Student Research Journal*. https://wsb.wharton.upenn.edu/wp-content/uploads/2023/05/Kostacos_2023_Basketball_HS.pdf
- Li, S., Luo, Y., Cao, Y., Li, F., Jin, H., & Mi, J. (2025). Changes in shooting accuracy among basketball players under fatigue: a systematic review and meta-analysis. *Frontiers in Physiology*, 16, 1-14. <https://doi.org/10.3389/fphys.2025.1435810>
- Magel, R., & Unruh, S. (2013). Determining factors influencing the outcome of college basketball games. *Open Journal of Statistics*, 03(04), 225–230. <https://doi.org/10.4236/ojs.2013.34026>
- Sampaio, J., & Janeira, M. (2003). Statistical analyses of basketball team performance: understanding teams' wins and losses according to a different index of ball possessions. *International Journal of Performance Analysis in Sport*, 3(1), 40–49. <https://doi.org/10.1080/24748668.2003.11868273>
- Sutiono, A. P., Ramadan, R., Jarukasetporn, P., Takeuchi, J., Purwarianti, A., & Iida, H. (2015). A mathematical model of game refinement and its applications to sports games. *EAI Endorsed Transactions on Creative Technologies*, 2(5), 150095. <https://doi.org/10.4108/eai.20-10-2015.150095>
- Zhang, S., Gomez, M.A., Yi, Q., Dong, R., Leicht, A., & Lorenzo, A. (2020). Modelling the relationship between match outcome and match performance during the 2019 FIBA basketball world cup: A quantile regression analysis. *International Journal of Environmental Research and Public Health*. 17(16), 5722. <https://doi.org/10.3390/ijerph17165722>