

Moneyball Part Deux

*How to get the Colorado Rockies to the
World Series*



Team



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Sandokan Stage

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Executive Summary

Objective

This analysis seeks to rejuvenate the Colorado Rockies by applying a "Moneyball" strategy, which involves a rigorous statistical analysis comparing the current players' performance metrics with those of the 2007 World Series team. By meticulously evaluating player statistics and identifying critical performance indicators, we aim to pinpoint strengths and weaknesses in the current lineup. Through this process, we will recommend targeted changes such as potential trades or acquisitions to optimize team composition and improve overall performance.

Our objective is to strategically position the Rockies for a return to the World Series, drawing on historical successes of the 2007 team and modern analytics to guide our decisions. With a focus on continuous monitoring and adaptive strategies, we envision a revitalized team that excels in the competitive landscape of Major League Baseball.

Executive Summary

Data Overview and Approach

Data was collected for the Rockies 2007 and 2024 rosters from Baseball Reference resource online. The team both scraped tables from the website and downloaded excel documents to perform our analysis.

The team took a 4-pronged approach to dividing and reviewing the data. Each team member looked at a specific subset of player statistics, including batting, pitching, and fielding. Additionally our team looked at appearance and salary data to help us determine whether certain players contribute their “worth” to the Rockies.

Each team member performed several statistical analysis and visualizations to better understand how the 2007 and 2024 teams performed relative to each other and identify areas for the 2024 Rockies to improve.

Executive Summary

Questions to Answer

1. How do the **batters** in 2024 compare to 2007, and what needs to change in order to improve the team?
2. How do **Starting Pitchers, Relief Pitchers, and Closing Pitchers** in 2024 compare to the 2007 roster, and what needs to change in order to improve the team?
3. How does the Rockies **fielding** compare between the 2007 and 2024 seasons?
4. What changes should be made to the 2024 Rockies player roster to get them to the World Series?

Batting

How do the batters in 2024 compare to 2007, and what needs to change in order to improve the team?

We will look at:

1. On Base Percentage (OBP)
2. Runs Batted In (RBI)
3. Runs and Hits

On Base Percentage (OBP)

Measures how often a batter reaches base through hits, walks, or by being hit by pitch, relative to their total number of opportunities to bat.

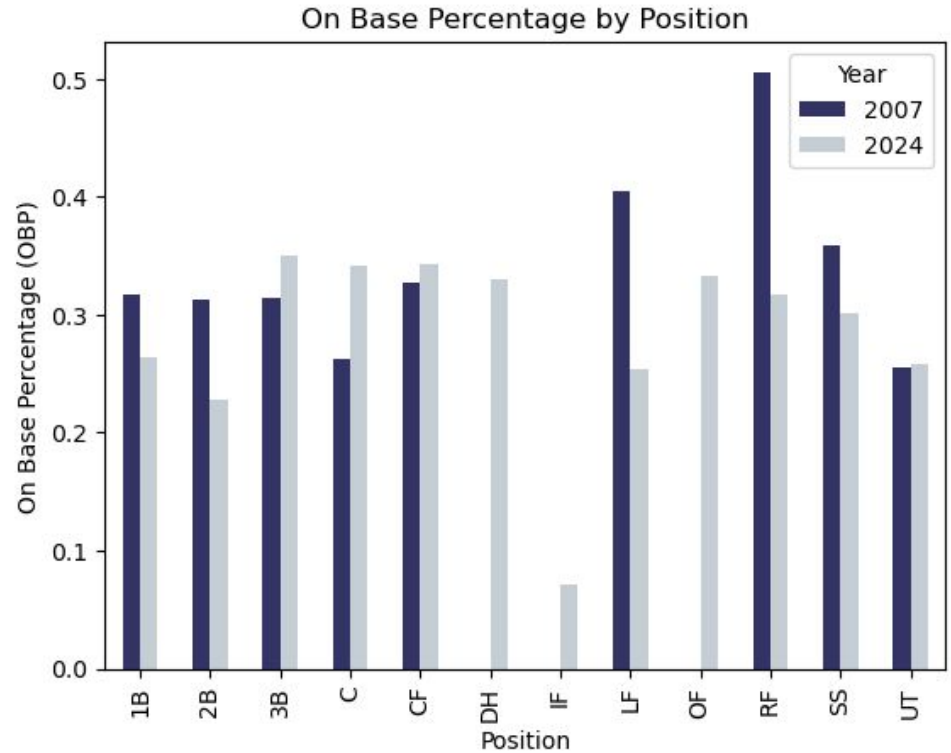
Getting on base is crucial to creating scoring opportunities.

Higher OBP indicates a more effective batter who helps create scoring opportunities.

The main statistic used in the Moneyball model is On Base Percentage.

OBP

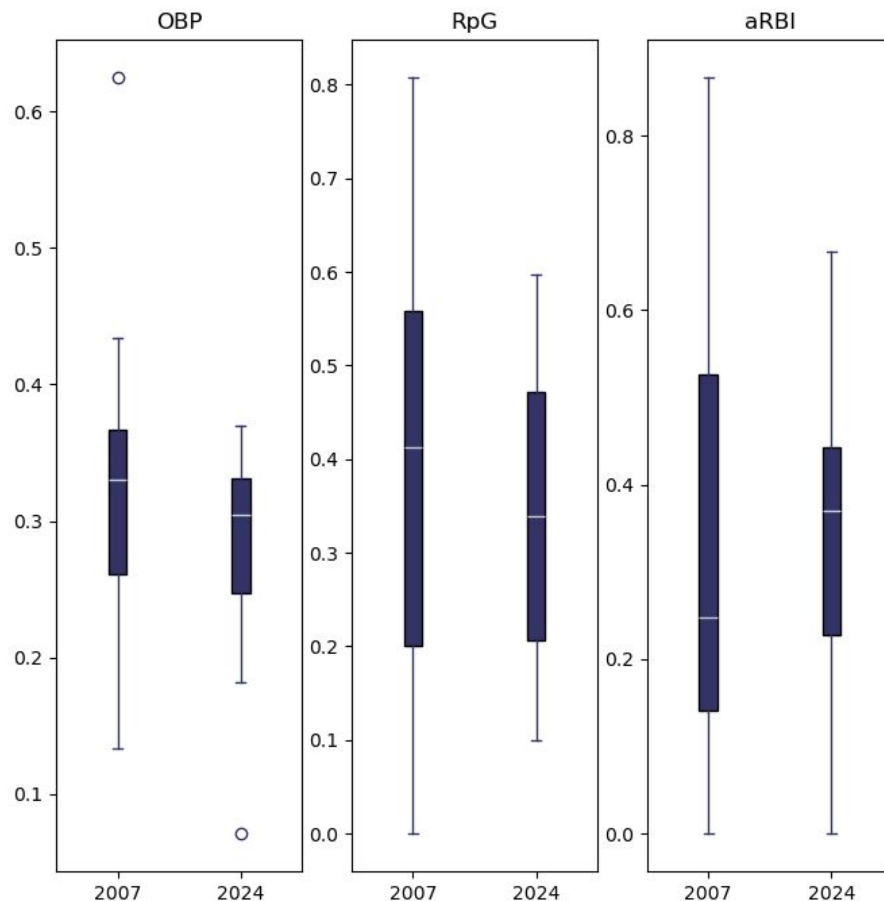
- Nearly every position in 2007 had a higher OBP and RBI than 2024.
- Significant OBP differences specifically for Left Fielders and Right Fielders between 2007 and 2024.



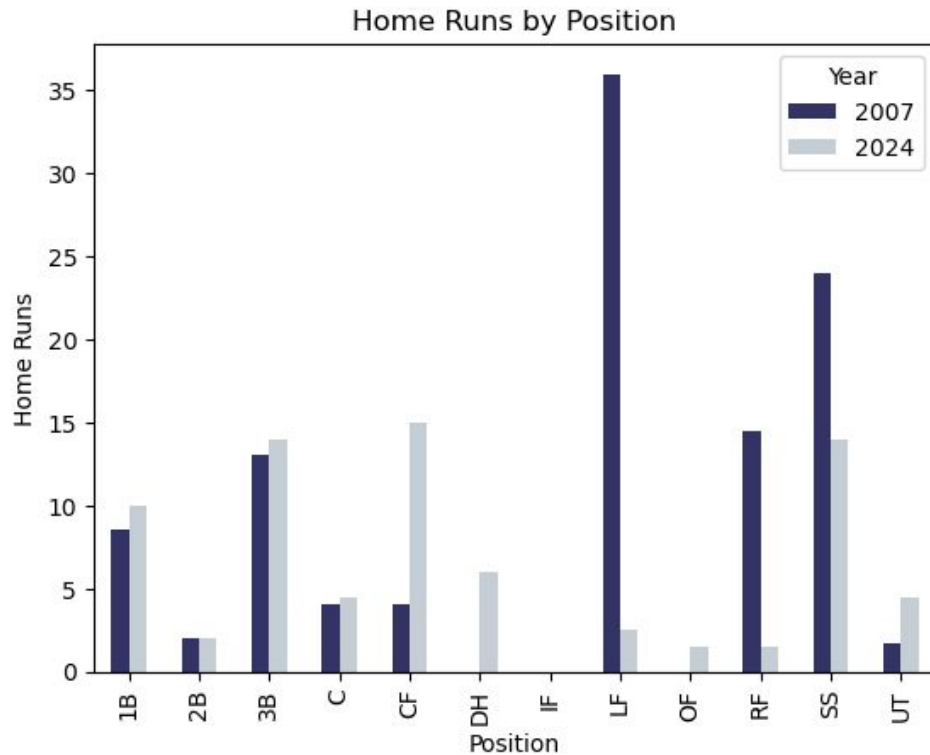
OBP, RpG, RBIs.

- The median OBP is slightly higher in 2007 v 2024. (33% v 30%).
- RpG and RBIs also are higher distributions in 2007 compared to 2024.
- Median aRBI is much lower in 2007 suggesting that the Rockies are concerned less with getting on base and more focused on power hitting.

OBP, RBI and RpG distribution

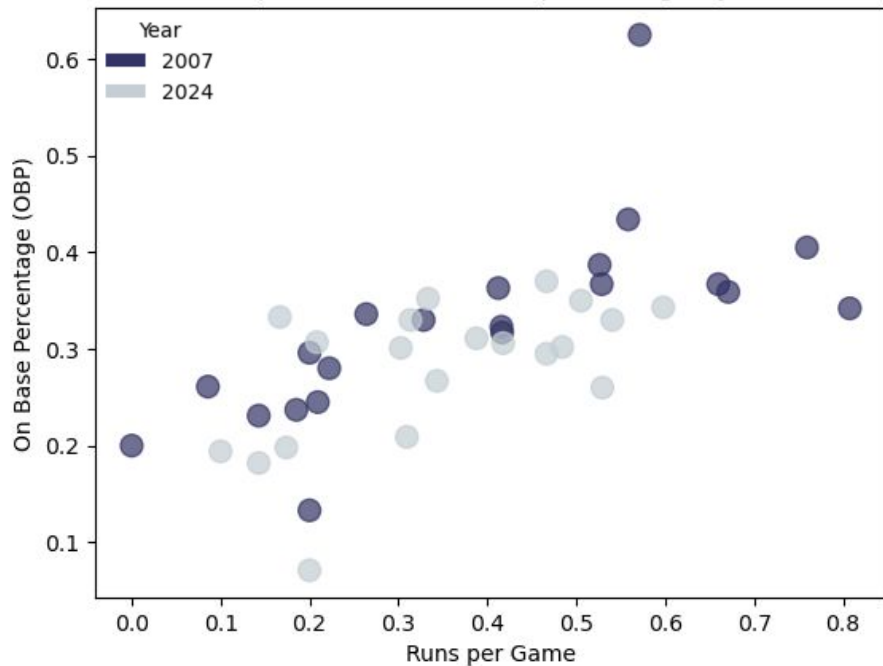


Home Runs

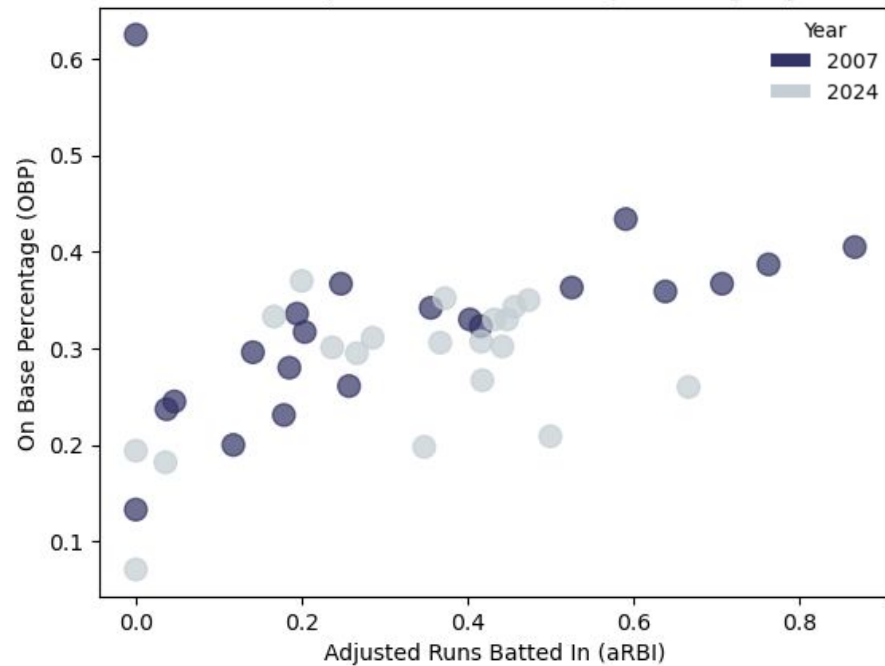


OBP

Runs per Game v On Base percentage by Year

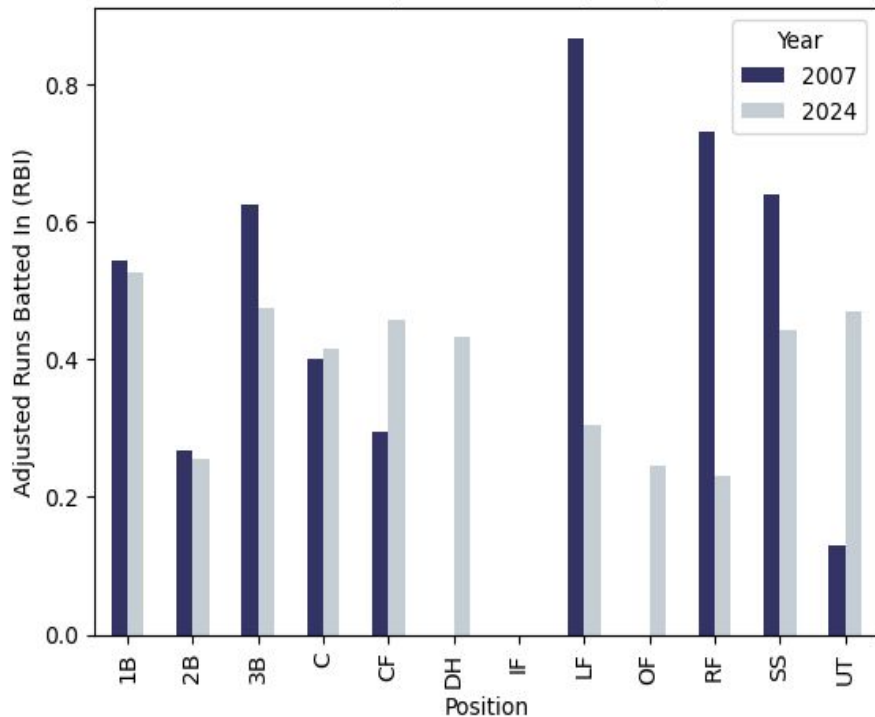


Runs Batted In per Game v On Base percentage by Year

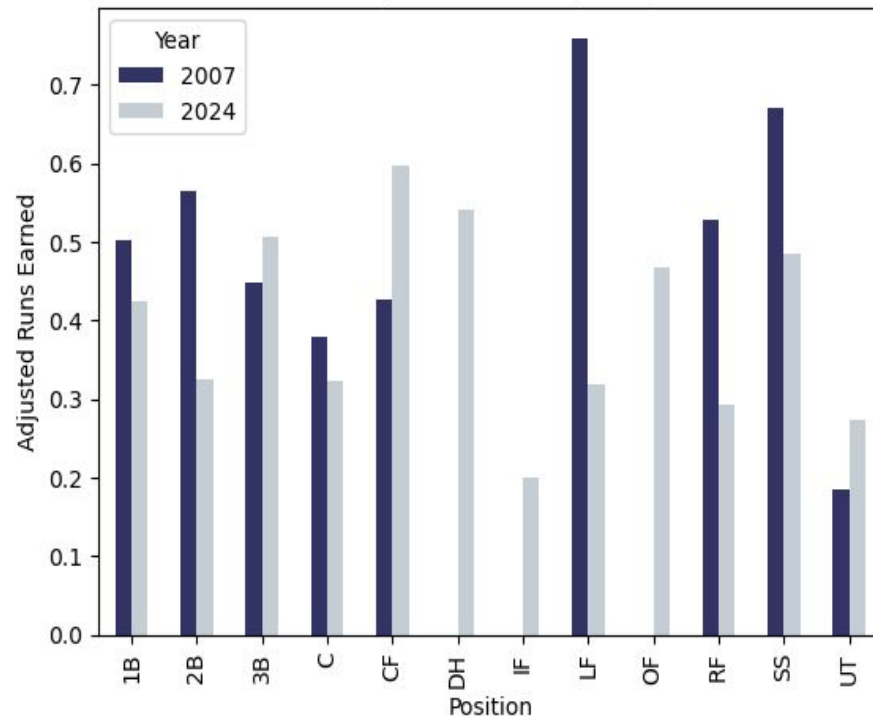


Runs and RBIs

Runs Batted In per Games Played by Position



Runs Earned per Games Played by Position



Conclusion:

OBP OBP OBP OBP OBP OBP OBP

OBP is an important statistic resulting in an overall better performing team.

Therefore, the Rockies need to prioritize this and re-establish this strategy in order to be closer to a chance at the World Series.

Prominent positions of struggle include Outfielders (Left and Right) and ShortStop. Replacing these players with those who have better OBPs is recommended.

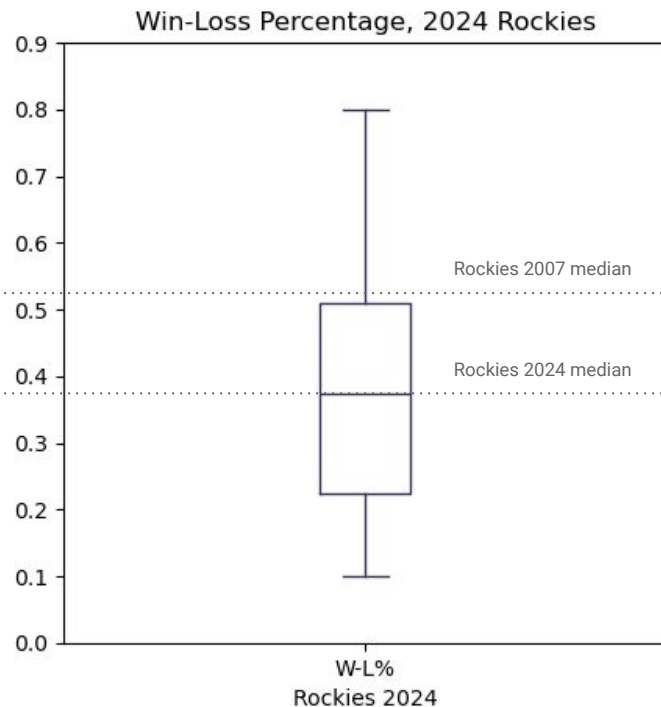
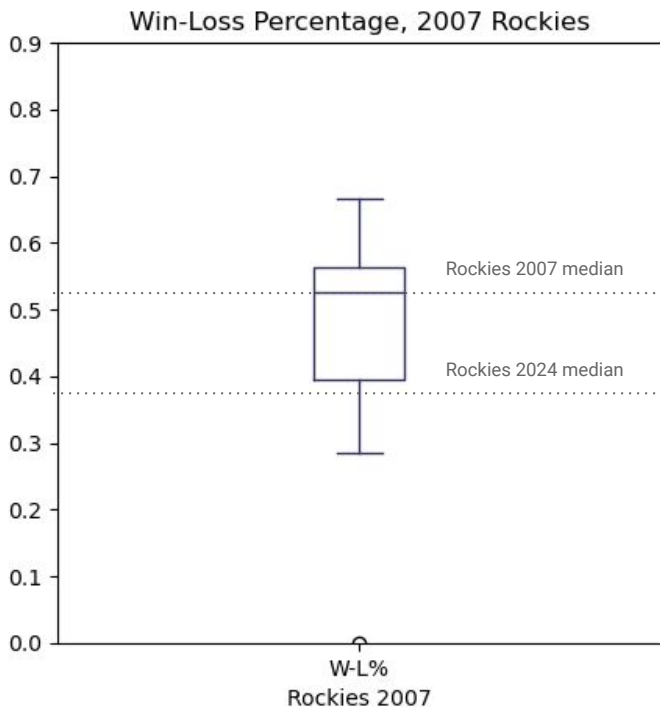
Pitching

How do Starting Pitchers (SP), Relief Pitchers (RP), and Closing Pitchers (CL) in 2024 compare to the 2007 roster, and what needs to change in order to improve the team?

We will look at:

1. Average Win-loss ratio
2. ERA
3. Strike-outs to Balls ratio

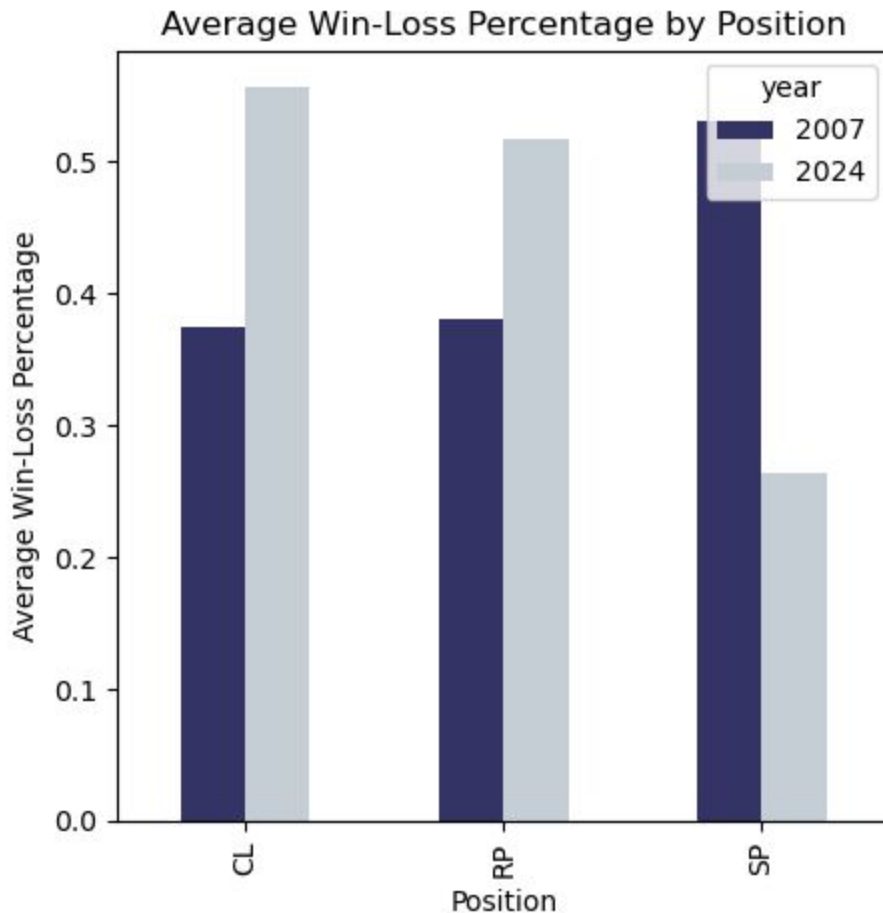
Pitchers' Win-Loss Percentage per Season



Average Win-Loss %

The win-loss ratio is calculated by dividing the number of wins by the total number of decisions (wins + losses). Higher scores are better, indicating a pitcher's ability to win games.

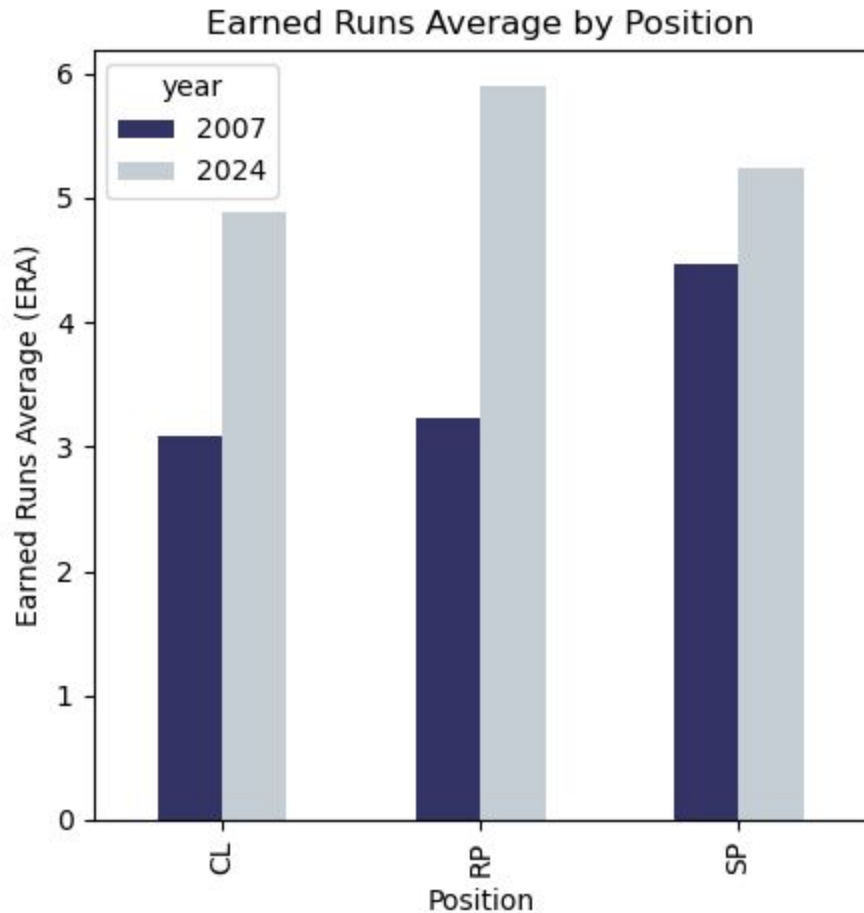
- 2024 CL and RP position appears to perform better in terms of their win-loss percentage. However, this may be misleading because the 2024 team has played fewer overall games so far, when compared to the 2007 team.
- CL and RP players also play fewer games than the starting pitchers.



Earned Runs Average (ERA)

Earned runs are runs that score due to the pitcher's performance, excluding unearned runs that result from errors, passed balls, etc

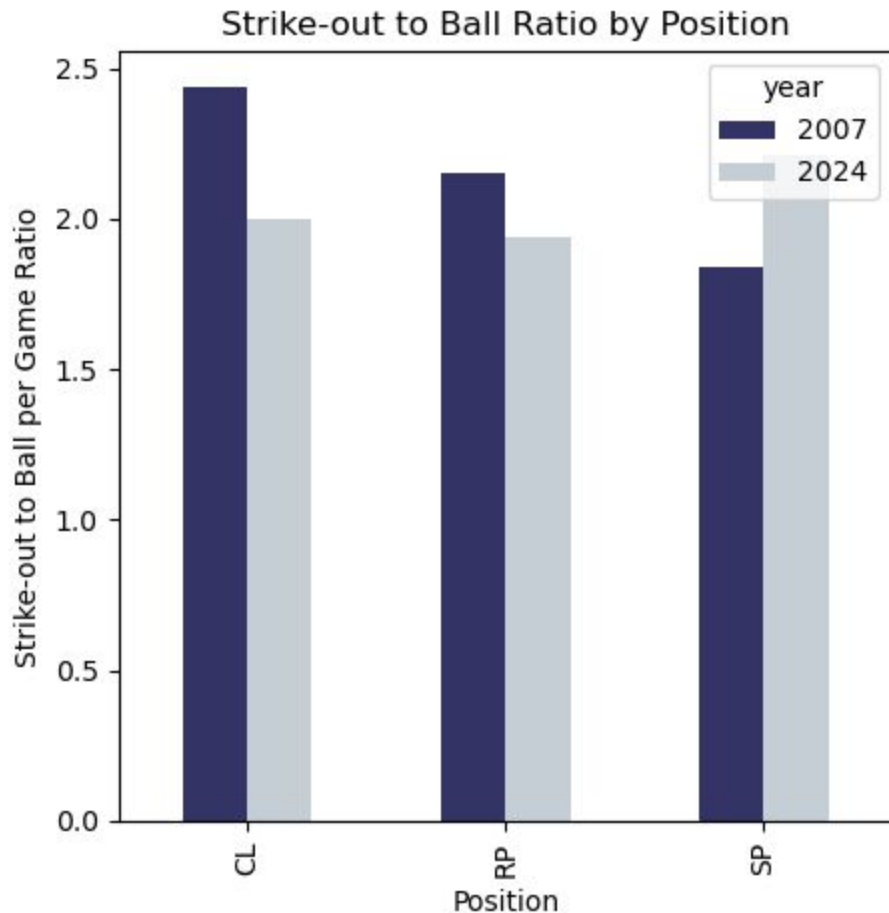
- 2007 lineup allowed fewer earned runs.
- 2024 RP and CL positions perform worse relative to SP.
- The average Earned Run Average for 2007 team was 3.89, while in 2024, the Earned Run Average for the team is 5.44.



Strike-Out to Balls Ratio (K/BB)

The Strike-out to Balls ratio is considered one of the best indicators of a pitcher's control and ability to miss bats. The higher score, the better. 3.0 ratio is considered ideal.

- 2007 CL and RP positions have more strikeouts than walks per game on average than the 2024 season.



“How do Starting Pitchers, Relief Pitchers, and Closing Pitchers in 2024 compare to the 2007 roster, and what needs to change in order to improve the team?”

1

2007 pitching roster out-performed the 2024 team in terms of:

1. Preventing earned runs
2. Striking-out batters and reducing the number of walks.

2

2024 closing pitchers and relief pitchers performed worse relative to the 2007 roster.

2024 starting pitchers showed fewer deficiencies regarding Home Runs Allowed, ERA and Strike-out to Ball Ratio.

Recommendation:

Improving ERA and K/BB Ratio, while focusing on identifying CL and RP players for trades

Fielding

How do does the Rockies fielding compare between the 2007 and 2024 seasons?

We will look at:

1. Fielding Percentage
2. Errors
3. Putouts
4. Chances to Errors

Fielding Percentage (Fld%)

Fielding percentage, also known as fielding average, is a statistic in baseball that measures a team's defensive efficiency. It is calculated as the sum of a team's putouts and assists divided by the sum of putouts, assists, and errors. The formula Fielding Percentage is calculated as $(\text{Assist} + \text{Putouts}) / (\text{Assists} + \text{Putouts} + \text{Errors})$.

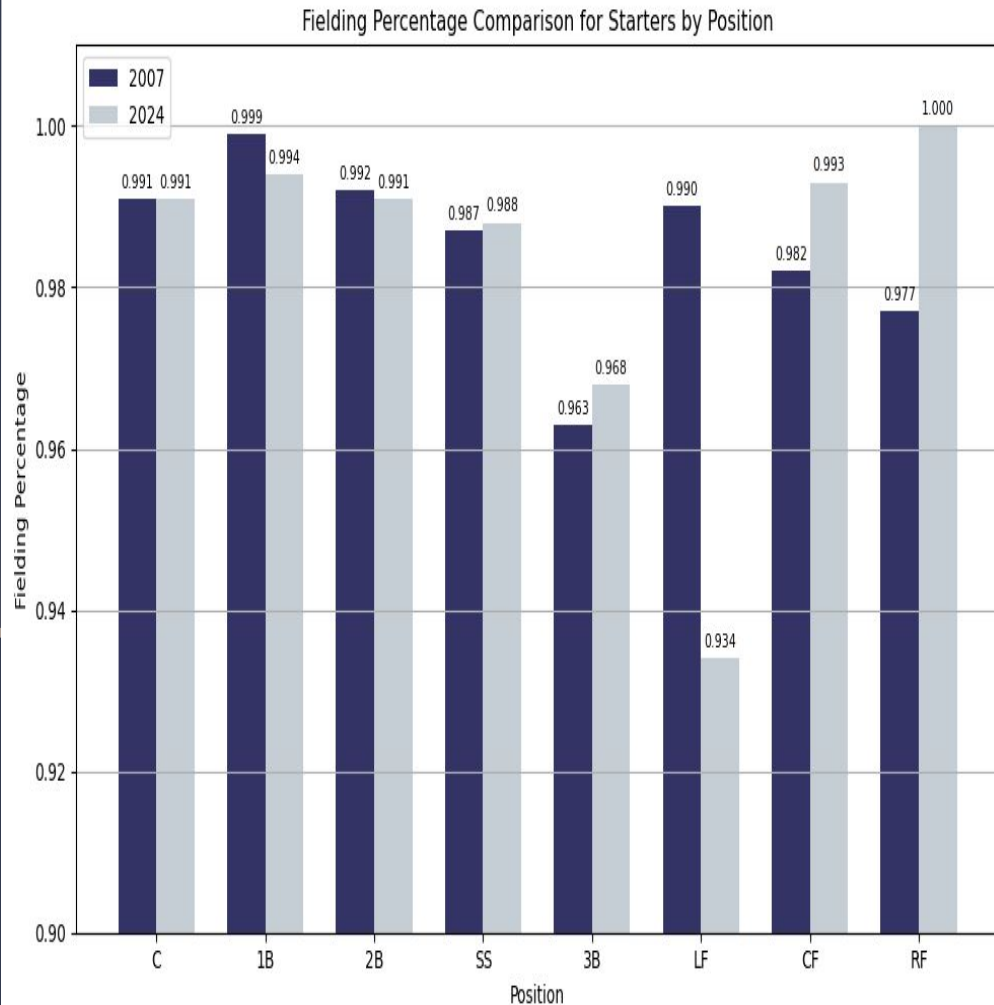
A higher fielding percentage indicates better defensive performance, as it reflects a team's ability to successfully make plays without committing errors.

Fielding is a critical component to reducing scoring opportunities for your opponent.

Fielding Percentage (Fld%)

A baseball player's fielding percentage is calculated similarly to that of a team's. It measures an individual player's defensive efficiency, at their relative position.

- Fielding Percentage for Rockies starters by position are relatively close across both seasons, except for Left Field

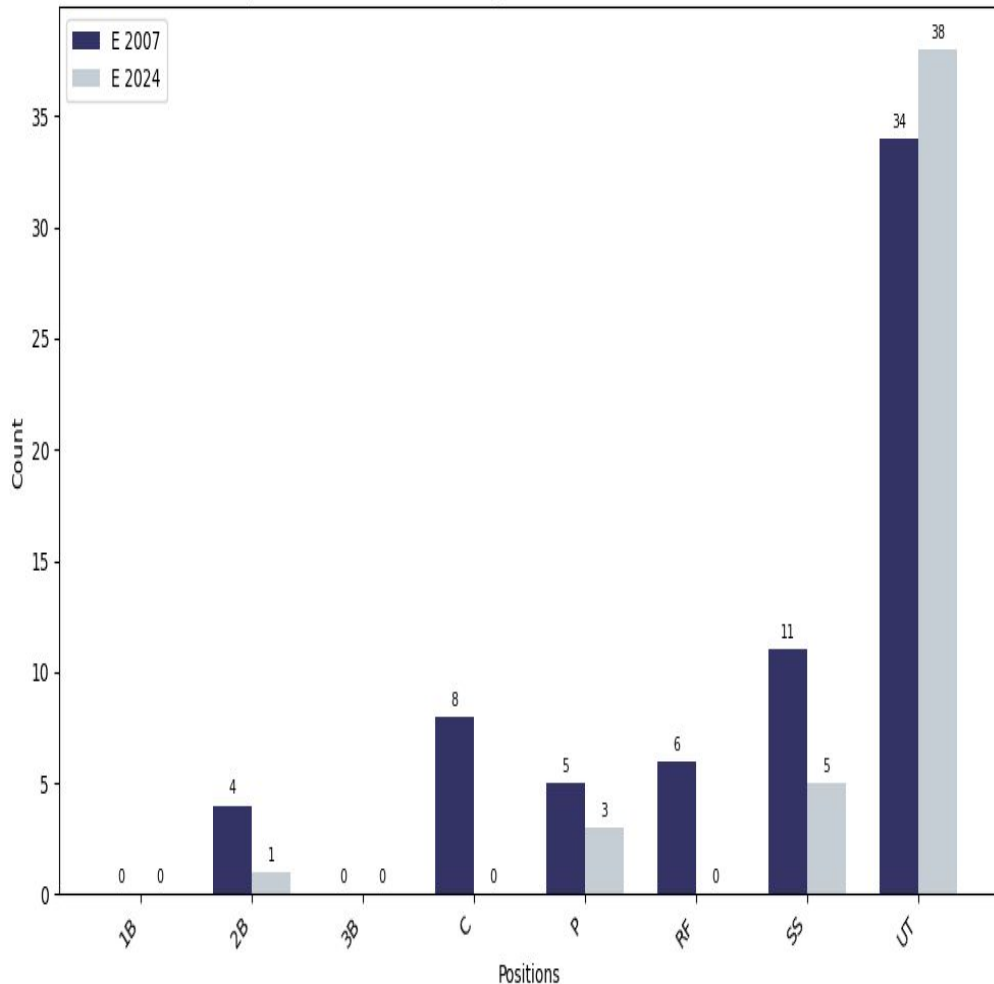


Comparison of Errors by Position

Errors by position in baseball represent the defensive mistakes made by players at specific positions on the field. Each position on a baseball team has unique responsibilities and challenges, and tracking errors by position helps to evaluate the defensive performance of players in their specific roles.

- Review of errors by position were relatively close across both the 2007 and 2024 seasons.

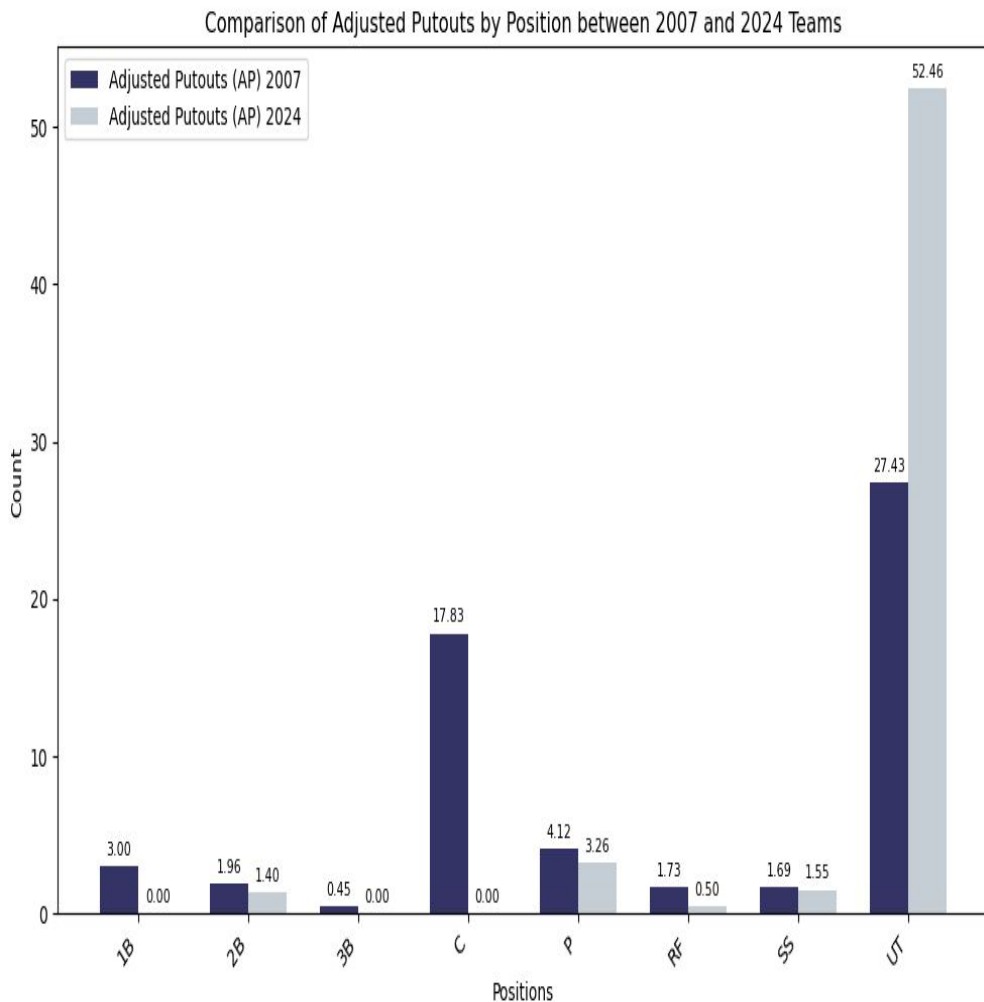
Comparison of Defensive Errors by Position between 2007 and 2024 Teams



Comparison of Putouts by Position

A putout (PO) is a statistic credited to a defensive player who is directly responsible for completing an out. The way putouts are recorded usually varies by position, reflecting the different roles and responsibilities of each defensive position.

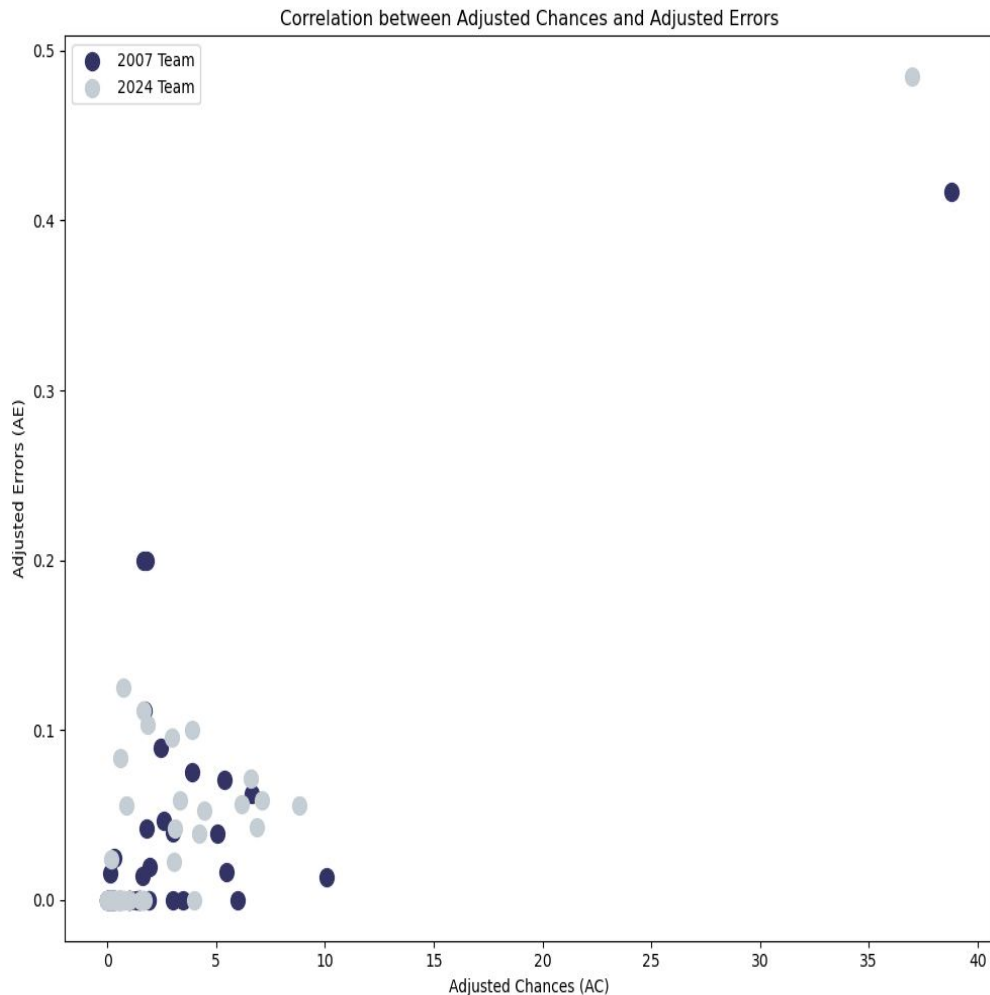
- The number of putouts were reasonably close except for the position of Utility Fielder (UT).



Correlation of Chances to Errors

The correlation between chances and errors can provide insight into a player's or a team's defensive reliability and workload.

- There is a high positive correlation between the 2007 and 2024 team when it came to the number of chances to the amount of errors committed. This might suggest that as a player or team gets more defensive opportunities, the number of errors also increases.



“How does the fielding of both pitchers and positional players in 2024 compare to that of the 2007 World Series team, and what needs to change in this area to help the Rockies improve?”

1

The 2007 roster surpassed the 2024 team in terms of:

1. Team fielding by position especially in Left Field
2. Number of errors committed

Recommendation:

Improving the quality of play for the Left Field position, while focusing on trades or calling up someone from the minors to fill the position.

Appearances

What changes should be made to the 2024 Rockies player roster to get them to the World Series?

We will look at:

1. Distribution of Salary & WAR by year
2. Clustering of Players based on salary and WAR
3. WAR by Position and Year

Roster comparison 2007 vs 2024

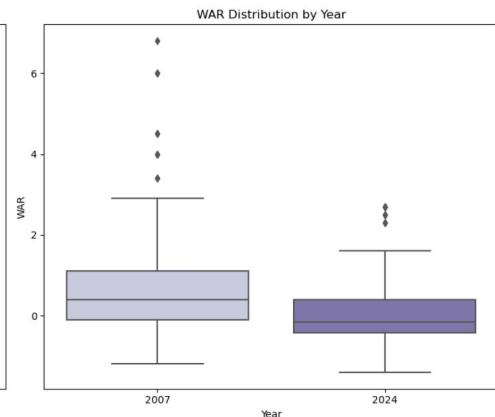
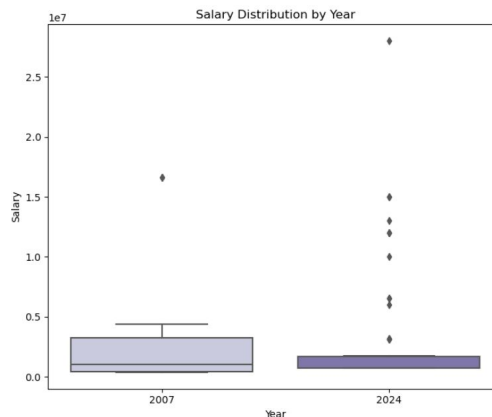
WAR, or Wins Above Replacement, is an advanced baseball statistic that attempts to summarize a player's total contributions to their team in one number. It measures the number of additional wins a player provides compared to a replacement-level player, which is a hypothetical average player who could be obtained at minimal cost (such as a minor league player or a free agent).

WAR takes into account various aspects of a player's performance, including:

- Batting: Measures a player's offensive contributions, such as hitting for average, power, and drawing walks.
- Base Running: Accounts for a player's ability to steal bases and take extra bases.
- Fielding: Evaluates a player's defensive contributions, including their range and ability to make plays.
- Pitching: For pitchers, WAR considers their ability to prevent runs.
- WAR is calculated differently for position players and pitchers, and different organizations (like Baseball-Reference and FanGraphs) have their own formulas for computing WAR.

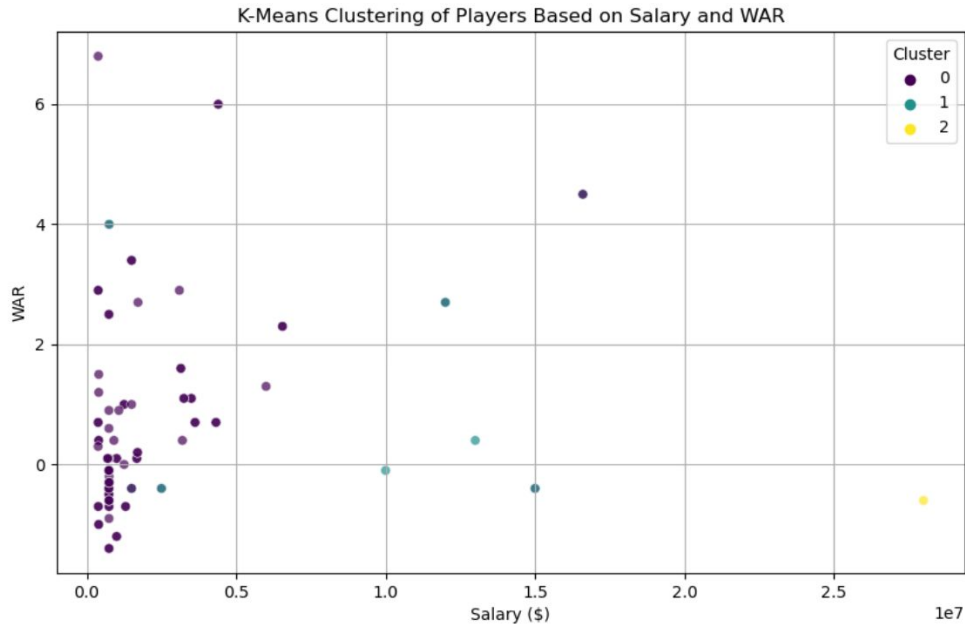
Salary Distribution vs WAR Distribution by year

- 2007 Data:
 - Salaries: Generally lower compared to 2024.
 - WAR Values: More evenly distributed, with fewer outliers and a balanced spread across the roster.
 - Callouts: Most players were likely paid less but contributed a solid performance to the team. The 2007 roster made it to the World Series, indicating a good return on investment.
- 2024 Data:
 - Salaries: Noticeably higher overall.
 - WAR Values: Higher variability with more significant outliers, indicating some players have much higher or lower performance compared to others.
 - Callouts: Some high-paid players have low WAR, indicating overpayment and underperformance. Conversely, there may be underpaid but highly performing players, showing possible inefficiencies in salary allocation.



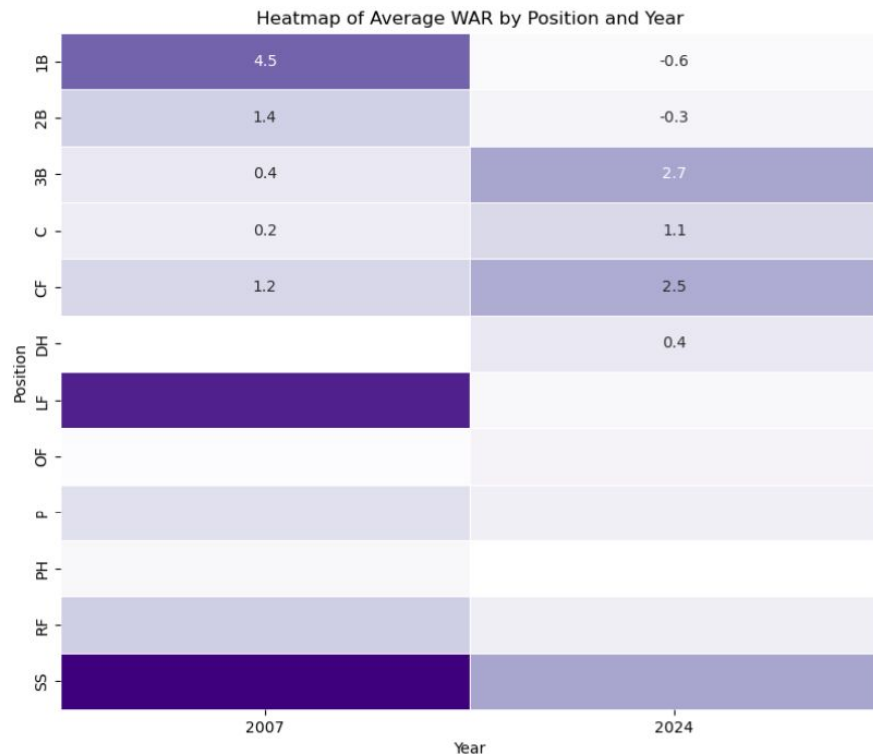
WAR vs Salary

- 2007 Roster: Showed a good balance with clusters indicating fair compensation for performance and potential growth areas.
- 2024 Roster: Showed more inefficiencies with a significant cluster of overpaid underperformers, highlighting the need for strategic adjustments in salary allocation and player performance improvement.



Avg. WAR by Position and Year

- Improved Infield Performance (2024):
 - The infield positions (1B, 2B, SS, 3B) in 2024 show a marked improvement in average WAR compared to 2007. This suggests strategic improvements in player acquisition or development for these positions.
- Decline in Outfield Performance (2024):
 - The outfield positions (LF, CF, RF) show a decline in average WAR in 2024 compared to 2007. This indicates a need to reassess the outfield roster and make improvements either through player development or acquisitions.



Conclusion

Observations and Recommendations

After thoroughly analyzing the Colorado Rockies' 2007 World Series team against the current 2024 roster, several key areas have emerged where improvements are crucial for a successful return to the postseason. The 2007 team was distinguished by its higher on-base percentage (OBP) and more effective pitching, notably in terms of earned run average (ERA) and strikeout-to-walk ratios. In contrast, the 2024 Rockies struggle with a lower OBP and have shown deficiencies in pitching, particularly in ERA and strikeout performance.

For the Rockies to regain their competitive edge, the focus should be on improving their OBP, especially in positions where the current roster is underperforming, such as the outfield and shortstop. Seeking trades or acquisitions for players with strong OBP metrics can address these gaps. Additionally, the pitching staff needs attention; improving ERA and the strikeout-to-walk ratio is essential. This may involve targeting new pitchers or optimizing the performance of current players.

The analysis also highlights that while infield positions have shown improvement in WAR (Wins Above Replacement) compared to 2007, the outfield positions have declined. This suggests a need for strategic adjustments either through player development or new acquisitions. Addressing these areas will help the Rockies realign with the successful strategies of the 2007 team and put them on a stronger path toward another World Series appearance.

Thank you!

Q&A

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Sources

Data was pulled from tables located on www.baseball-reference.com:

"https://www.baseball-reference.com/teams/COL/202

"https://www.baseball-reference.com/teams/COL/2024.shtml#team_pitching"4.shtml#team_batting"

"https://www.baseball-reference.com/teams/COL/2024-fielding.shtml#standard_fielding"

"https://www.baseball-reference.com/teams/COL/colorado-rockies-salaries-and-contracts.shtml#payroll"

"https://www.baseball-reference.com/teams/COL/2024-batting.shtml#players_value_batting"

"https://www.baseball-reference.com/teams/COL/2024-batting.shtml#players_cumulative_batting"

"https://www.baseball-reference.com/teams/COL/2024.shtml#appearances"

"https://www.baseball-reference.com/teams/COL/2024.shtml#players_value_pitching"

"https://www.baseball-reference.com/teams/COL/2007.shtml#team_batting"

"https://www.baseball-reference.com/teams/COL/2007.shtml#team_pitching"

"https://www.baseball-reference.com/teams/COL/2007.shtml#standard_fielding"

"https://www.baseball-reference.com/teams/COL/2007.shtml#appearances"

"https://www.baseball-reference.com/teams/COL/2007.shtml#coaches"

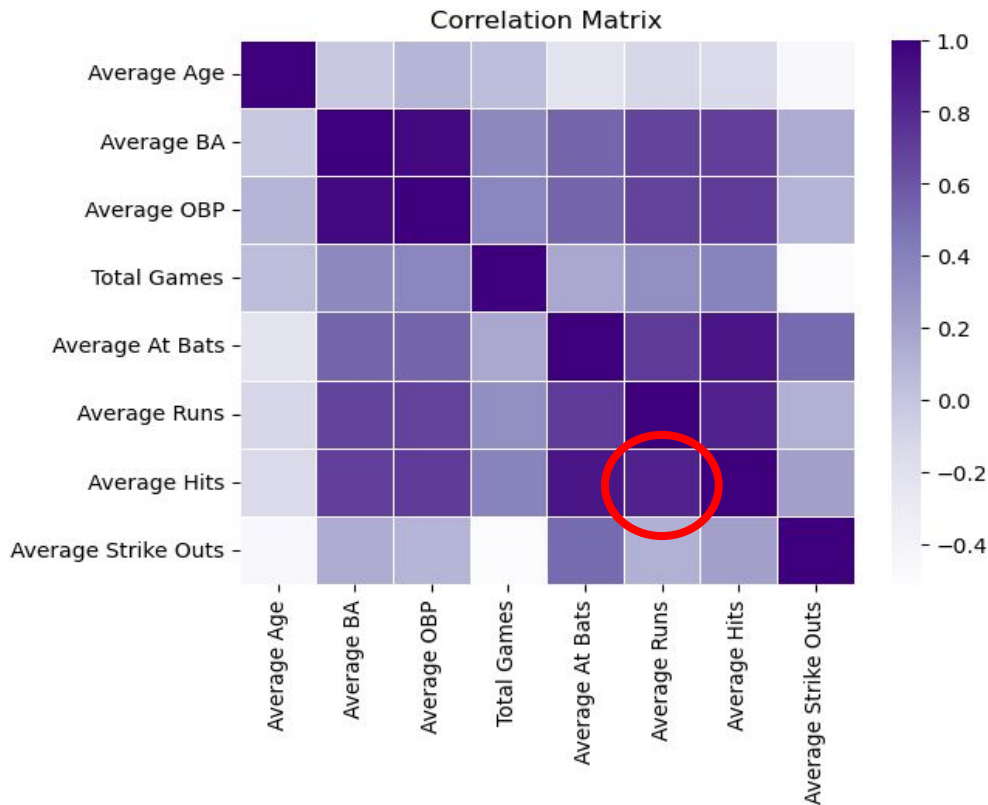
"https://www.baseball-reference.com/teams/COL/2007.shtml#players_value_batting"

"https://www.baseball-reference.com/teams/COL/2007.shtml#players_value_pitching"

Appendix

Correlation

- Obvious correlations
 - I.e. OBP to BA, Hits and At Bats etc.
- Big focus on how average hits correlate to runs earned.
 - Getting on base earns runs.



PITCHING

Home Runs Allowed (HR)

Home runs allowed refers to the number of times a pitcher has given up a home run to an opposing batter.

- There are nearly negligible differences in performance between 2007 and 2024 teams. However, CL and RP positions perform modestly worse in 2024, and have played fewer games in their season so far.

