Money in Baseball

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The Largest Contract in Sports History

- *Before 2024 Major League Season, Shohei Otani and LA Dodgers have signed for the 700-million-dollar contract*

- *This contract became the biggest contract in the world sports history, breaking Leonel Messi's record*

- *Shohei's salary is larger than the total team salary of Baltimore and Oakland*

Image Source: USA TODAY Sports

Data Explanation

1. MLB Team Statistics 2003 ~ 2018
(Kaggle)

YearTeam	RA/G	DefEff	E	DP	W	L	W-L%	ERA	tSho
2009 ARI	4.83	0.683	124	133	70	92	0.432	4.42	12
2009 ATL	3.96	0.686	96	159	86	76	0.531	3.57	10
2009 BAL	5.41	0.680	90	151	64	98	0.395	5.15	3
2009 BOS	4.54	0.678	82	121	95	67	0.586	4.35	11
2009 CHC	4.17	0.698	105	144	83	78	0.516	3.84	8
2009 CHW	4.52	0.689	113	158	79	83	0.488	4.14	11
2009 CIN	4.46	0.704	89	161	78	84	0.481	4.18	12
2009 CLE	5.34	0.681	97	170	65	97	0.401	5.06	6
2009 COL	4.41	0.688	87	146	92	70	0.568	4.22	7
2009 DET	4.57	0.694	88	164	86	77	0.528	4.29	9

2. 2023 MLB WAR / WAA Data
(Web Scraped from ESPN)

Name	WAR	WAA
Shohei Ohtani	10.1	7.4
Mookie Betts	8.4	6.4
Ronald Acuna Jr.	8.1	6
Gerrit Cole	7.5	5.7
Marcus Semien	7.4	5.2
Matt Olson	7.4	5.2
Corey Seager	6.9	5.3
Freddie Freeman	6.6	4.4
Gunnar Henderson	6.3	4.3
Blake Snell	6	4.5

3. 2023 MLB Salary Data
(Web Scraped from Spotrac.com)

| Name	Age	Payroll
Max Scherzer	38	43333333
Justin Verlander	40	43333333
Aaron Judge	31	40000000
Anthony Rendon	33	38571428
Mike Trout	31	37116666
Gerrit Cole	32	36000000
Corey Seager	29	35500000
Nolan Arenado	32	35025000
Stephen Strasburg	34	35000000
Francisco Lindor	29	34100000

Why?

Spending per win (Entire Teams)
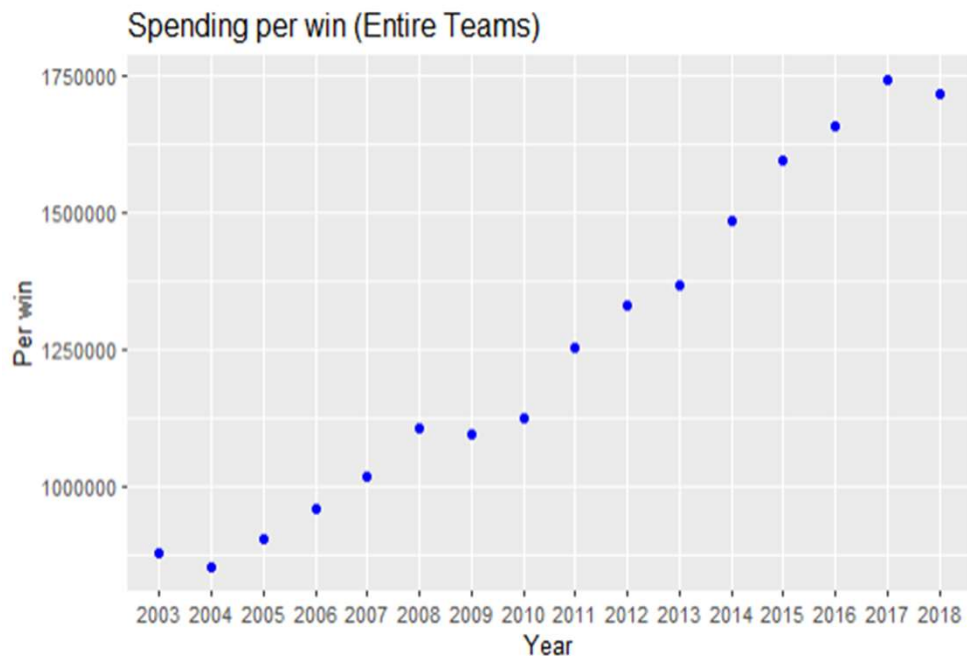
Average spending per win in the League is constantly increasing

Reasons teams pay massive money to players

- *Marketing*
- *Long-Term Investment*
- ***Talent & Performance***
- ***Competitive Advantage***

- ***Baltimore has the higher winning rate than LAD at this point***
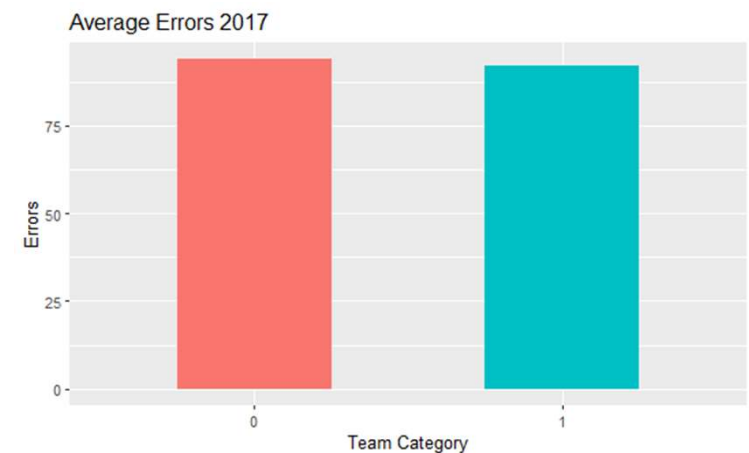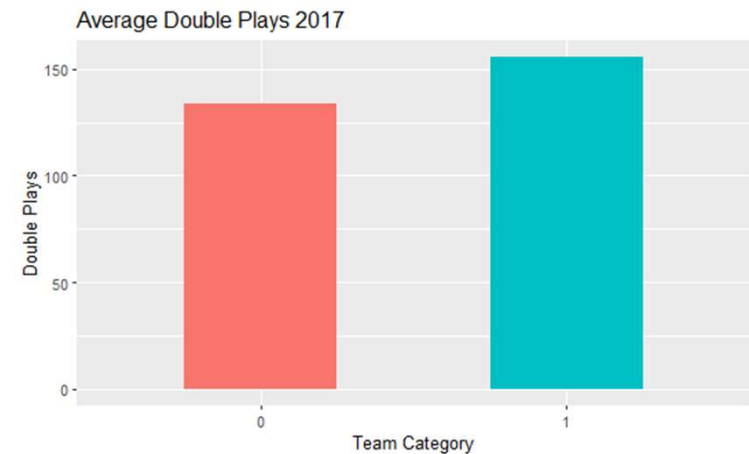
Does More Money Mean More Wins?

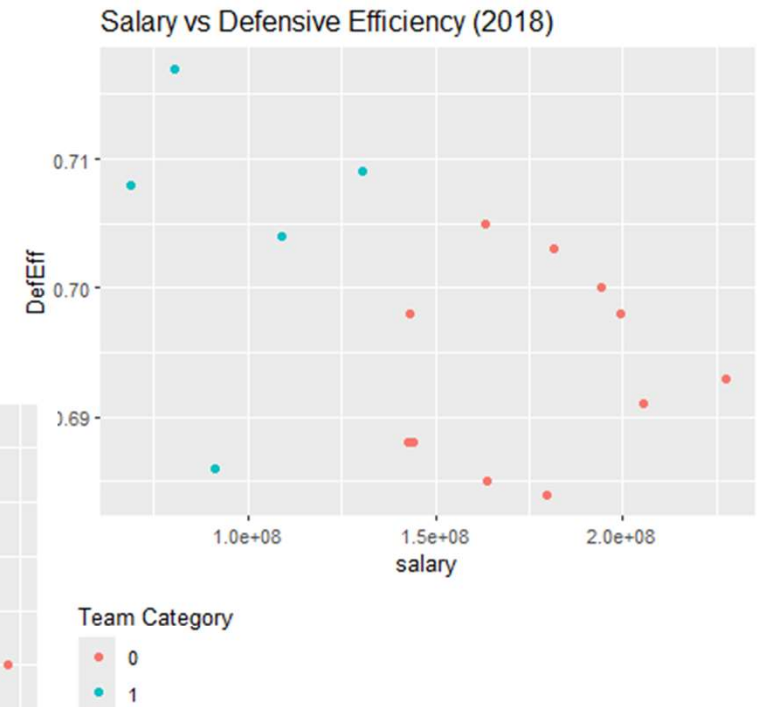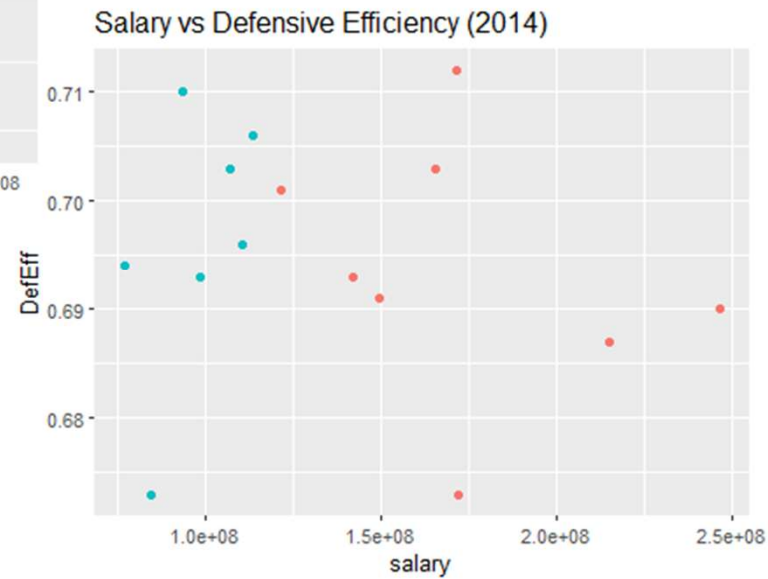*"Yankees spent 1.4 million per win, you paid 260k"* – Money Ball (2011)
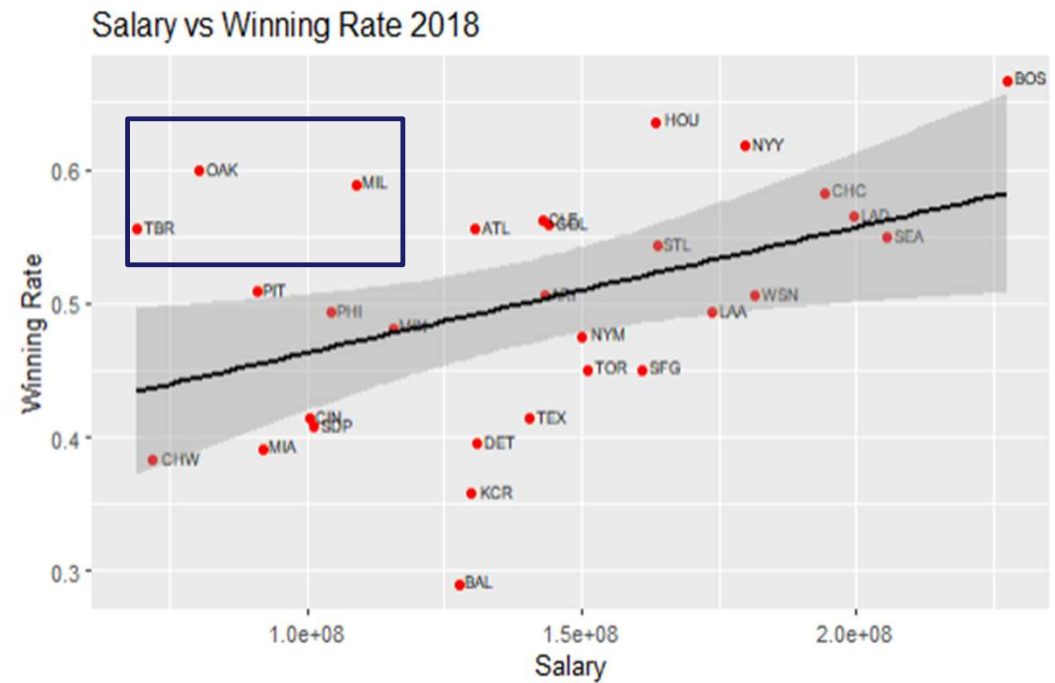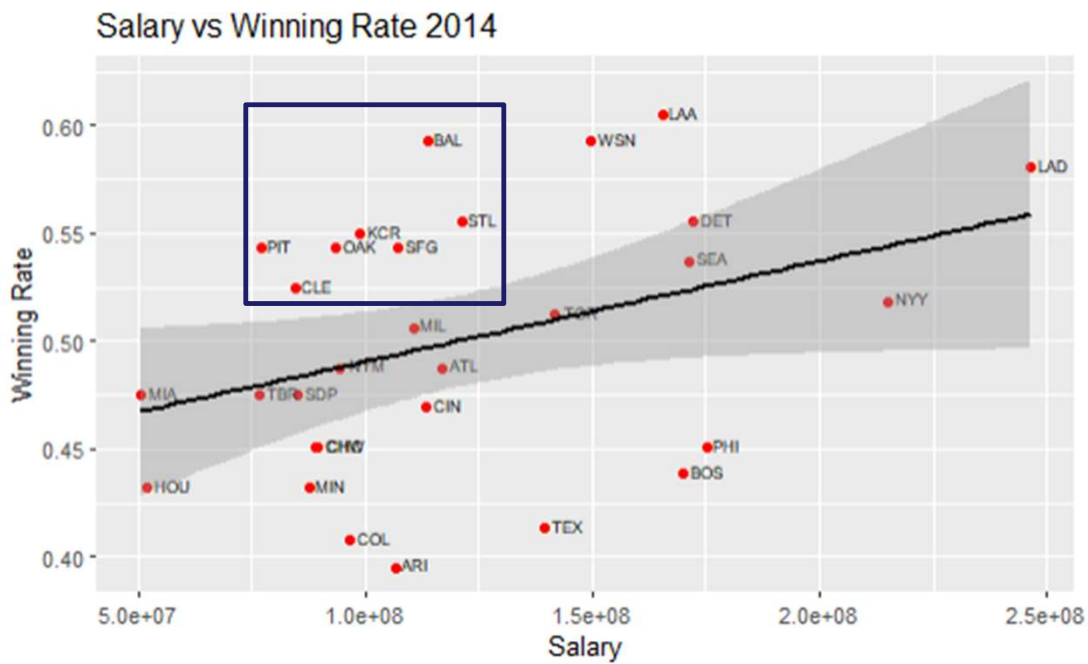
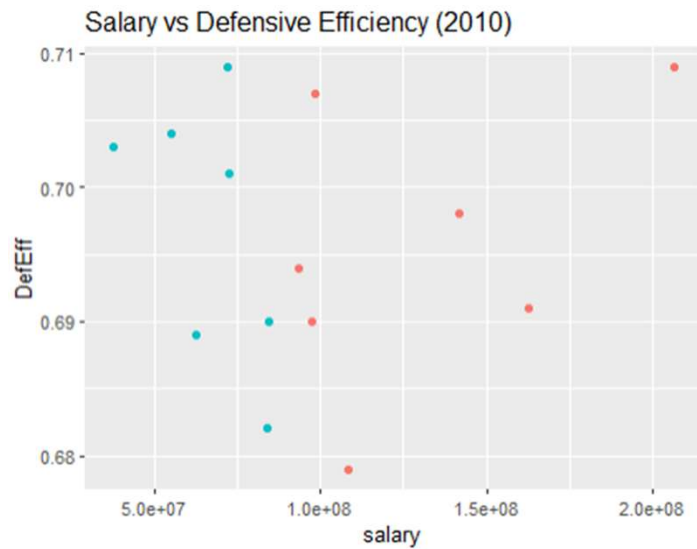# What Are Features Cost-Effective Teams Have?

1. By season, teams with winning rate over 50 percent were filtered

2. Teams that spent less than league average salary were labeled 1, and other teams were labeled 0 (Variable importance plot)

3. There were slight difference by seasons, but there were similar tendencies that cost-effective teams were more likely to have better defensive assessments (Double Play, Defensive effectiveness, Errors)

Average Double Plays 2017

Average Errors 2017

What Are Features Cost-Effective Teams Have?

Salary vs Defensive Efficiency (2010)

Salary vs Defensive Efficiency (2014)
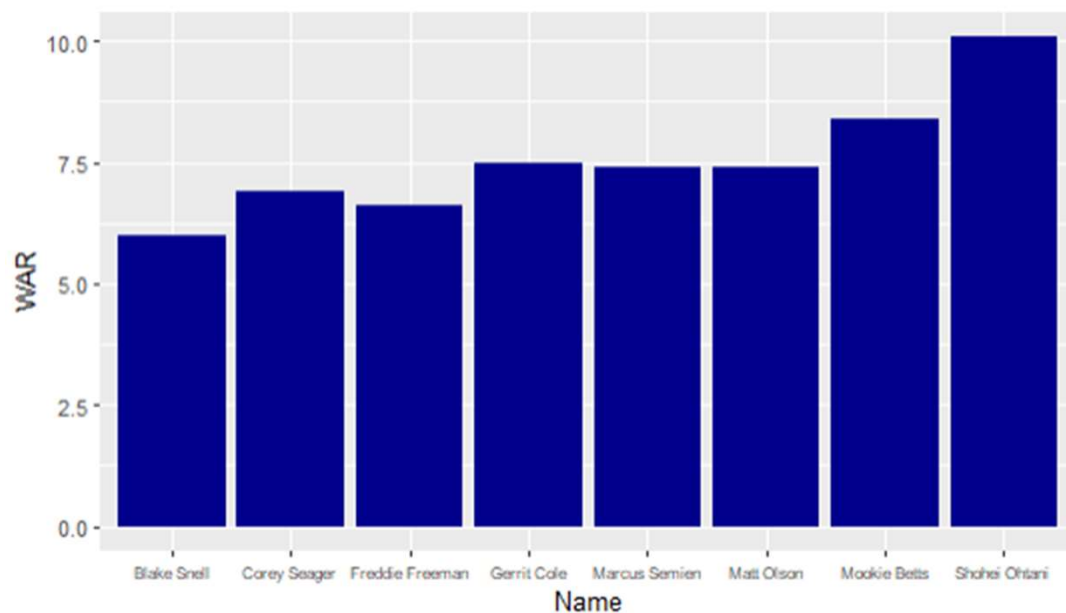
Salary vs Defensive Efficiency (2018)

Additional Question

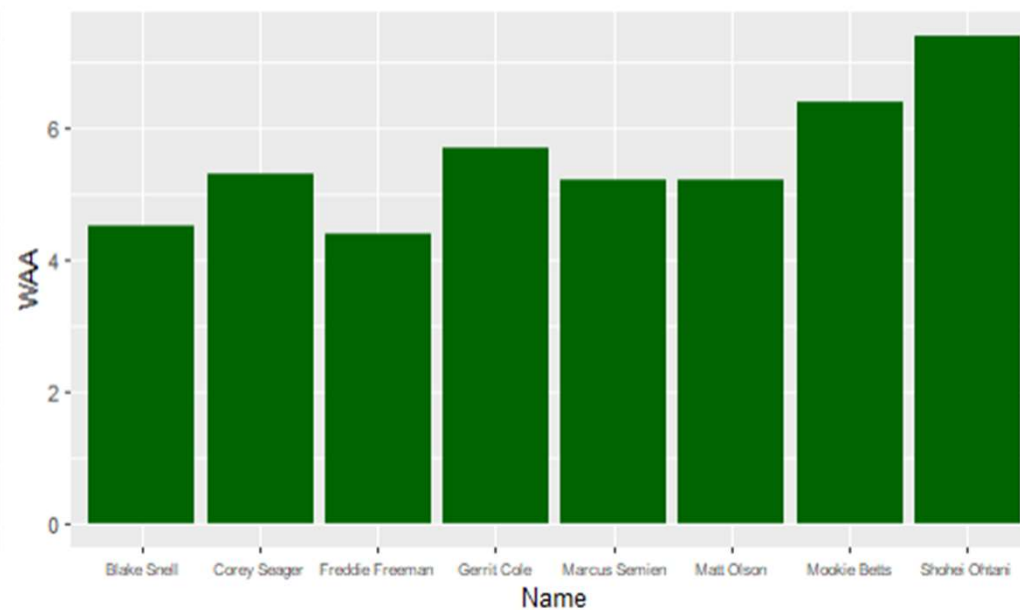*Is Shohei Ohtani's historical contract reasonable?*

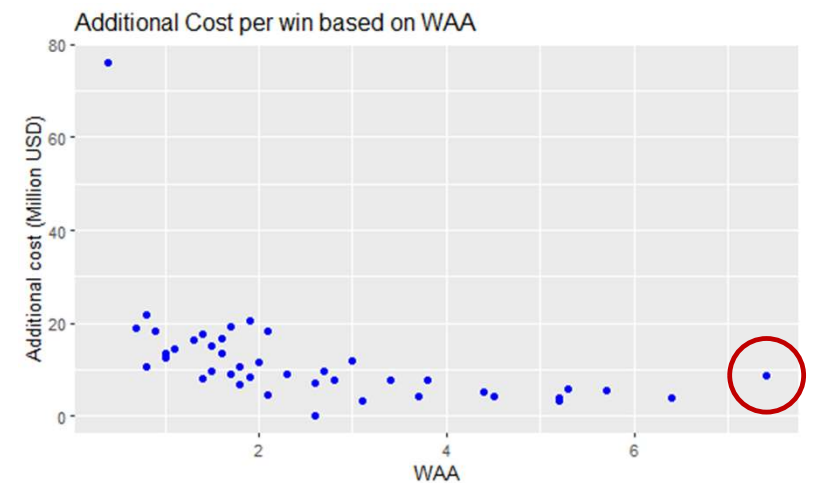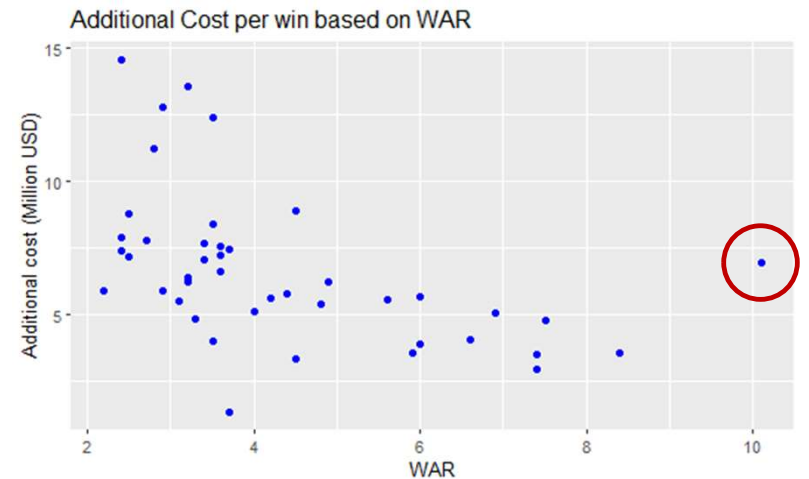## WAR – Wins Above Replacement

2023 Season WAR

WAA – Wins Above Average

2023 Season WAA

Additional Question

Assuming that the average salary for MLB players is 4.5 million USD, LAD is paying 7 million USD to Shohei Ohtani per additional win compared to scouting average-level MLB player (8.8 million USD per win compared to a AAA player)

This plots are based on players who are in Top 200 WAR & Top 100 Salary

Conclusion

- *To manage the team cost-effectively, it is more efficient to focus on defensive measures rather than offensive measures.*

- *As mentioned by comparing Baltimore and LAD, investing in star players does not guarantee the best result (Only with performance metrics excluding marketing / business aspect)*

- *Comparing to other star players, Shohei Ohtani's contract is reasonable. If multiple aspects in marketing and business are included, LAD made the rational contract.*