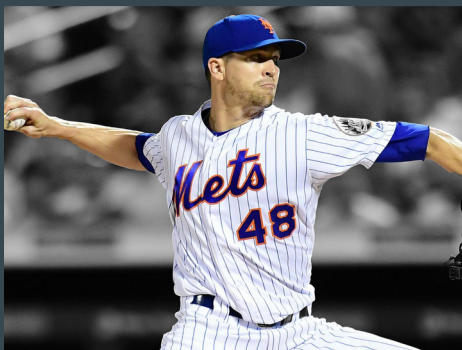




ANALYZING THE VALUE OF STARTING PITCHERS VS. RELIEF PITCHERS IN THE MLB



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FOR ALREADY-CONTENDING TEAMS, IS IT SMARTER TO INVEST IN A **STARTING ROTATION** OR A **BULLPEN**? WHICH SHOULD A TEAM BOLSTER ASSUMING THEY HAVE THE OPPORTUNITY TO DO SO?



HERE'S WHAT WE HYPOTHESIZED, THEN WHAT WE FOUND...

Research Hypothesis



It is smarter for an organization to invest in **relief pitching** when evaluating in terms of financial strain and quality of innings pitched.
















Question 1: Which teams are starting pitching heavy and which teams are bullpen heavy?



Top 15 Teams (Innings Pitched by Starting Pitchers)

Median of all 30 teams = 854
IP

*All data relative to the 162 regular season
games of 2019*

	Team		IP
1	Mets		941.1
2	Nationals		938.2
3	Indians		930.1
4	Astros		907.1
5	Dodgers		893.2
6	Twins		889.2
7	Cubs		888.0
8	Marlins		888.0
9	Athletics		886.0
10	Reds		883.1
11	Cardinals		883.0
12	Braves		873.0
13	Phillies		869.2
14	Diamondbacks		867.1
15	Royals		860.0

Top 15 Teams (Innings Pitched by Relievers)

RIP = 1458 - IP

(1458 is 162*9, the number of regular season innings played excluding extra innings)

**Median of all 30 teams = 604
IP**

All data relative to the 162 regular season games of 2019

	Team		RIP
1	Angels		777.0
2	Rays		755.9
3	Blue Jays		746.9
4	Mariners		713.0
5	Yankees		679.9
6	Brewers		669.8
7	Orioles		669.0
8	Tigers		657.0
9	Red Sox		652.0
10	Rangers		650.0
11	Padres		645.0
12	Pirates		644.8
13	Rockies		615.9
14	White Sox		610.8
15	Giants		609.0

Question 2: How much of their payroll do starting/relief pitching heavy teams invest in their respective staffs?



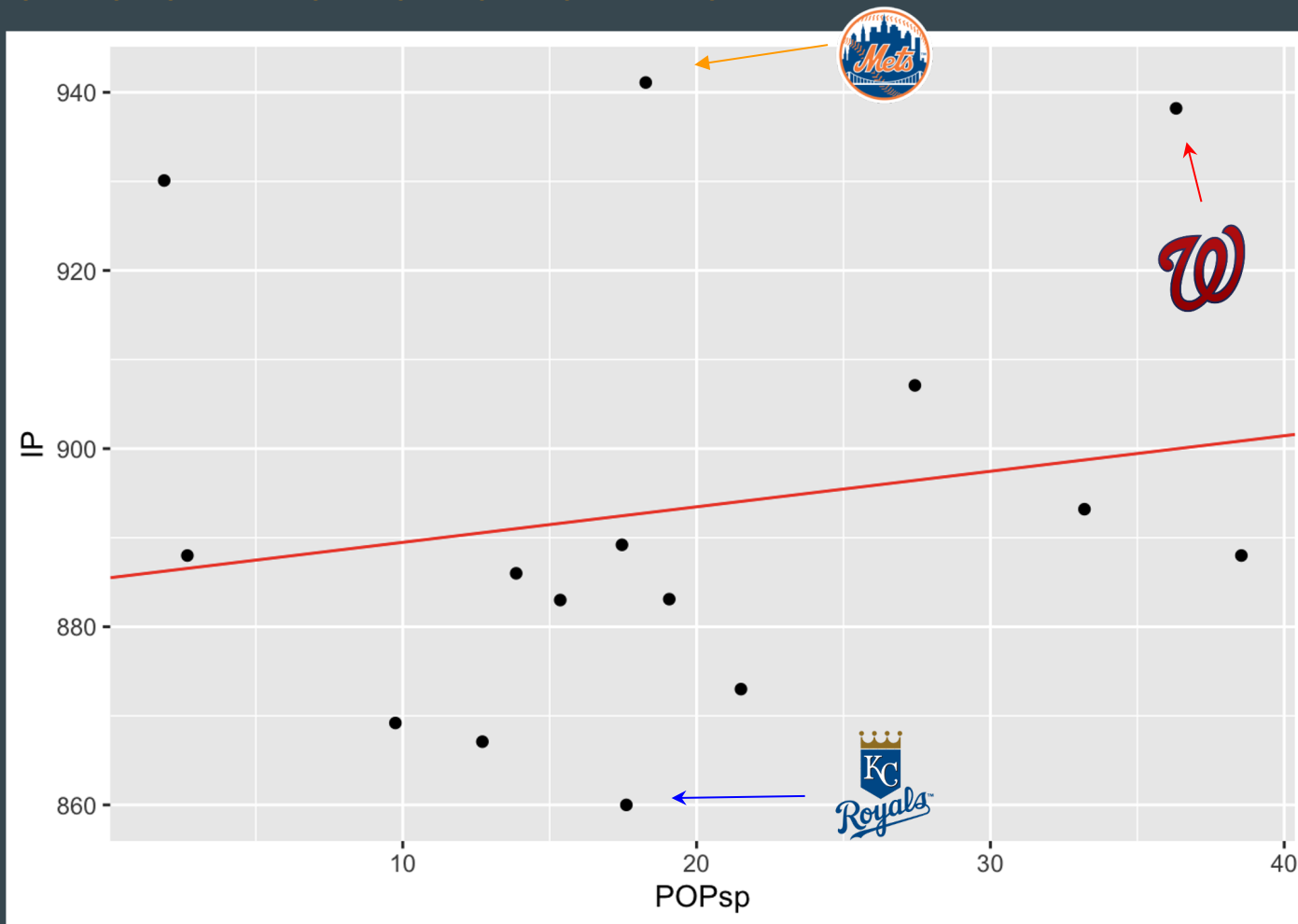
PERCENT OF PAYROLL FOR STARTING PITCHING BY STARTING IP

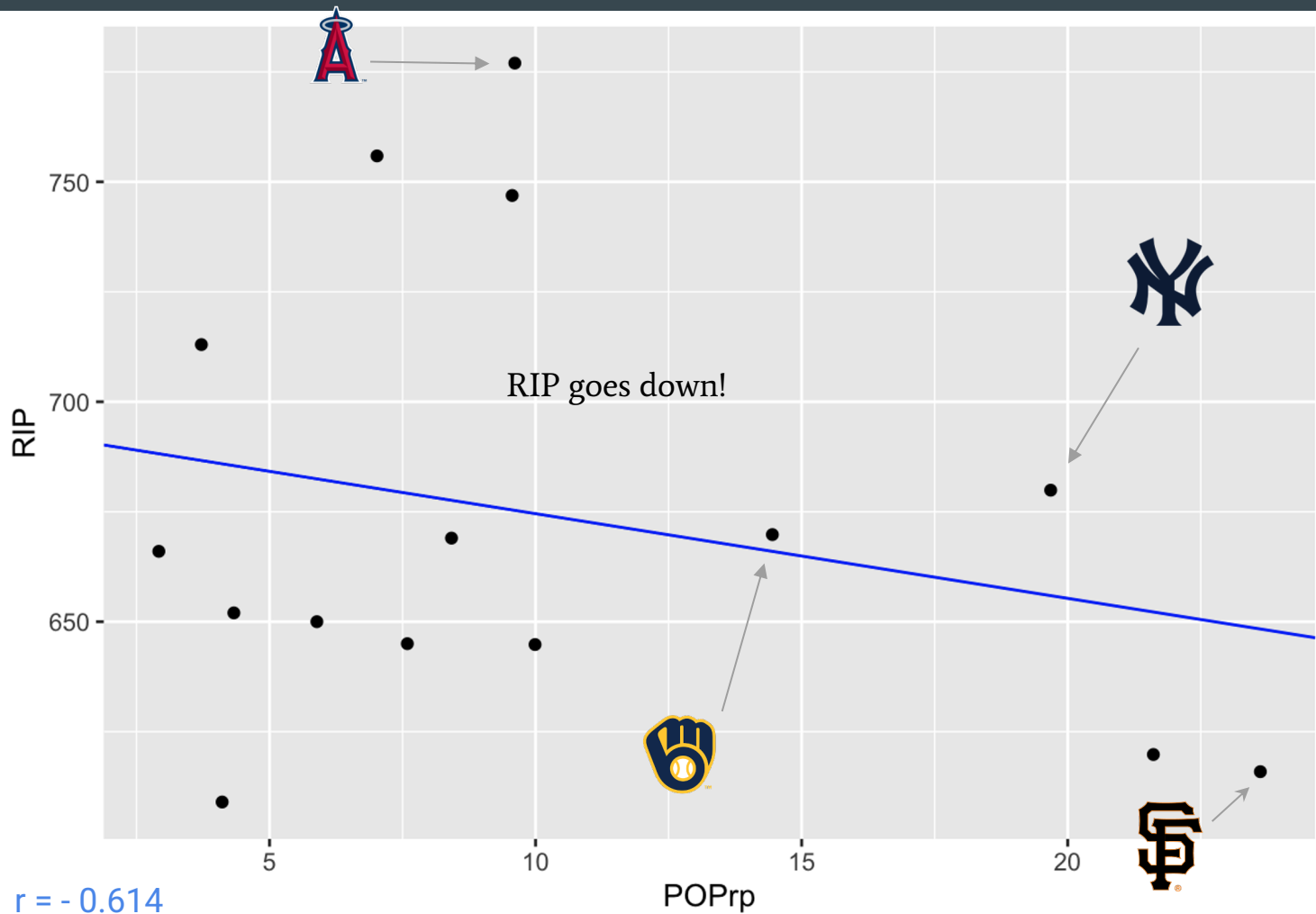
OF THE STARTING
PITCHING_HEAVY
TEAMS
PREVIOUSLY
IDENTIFIED

$R = 0.173$

~

WEAK





WHAT DOES THIS SHOW?

THIS GRAPH SHOWS THAT THE TEAMS THAT PITCH THE MOST INNINGS FOR RELIEF DO NOT EVEN SPEND THE MOST MONEY BUILDING THEIR TEAM AROUND RELIEF PITCHING.

IT IS A CHEAP OPTION TO INVEST IN INNINGS PITCHED BY BULLPEN

Question 3: Based on WAR, is starting pitching or relief pitching more valuable?



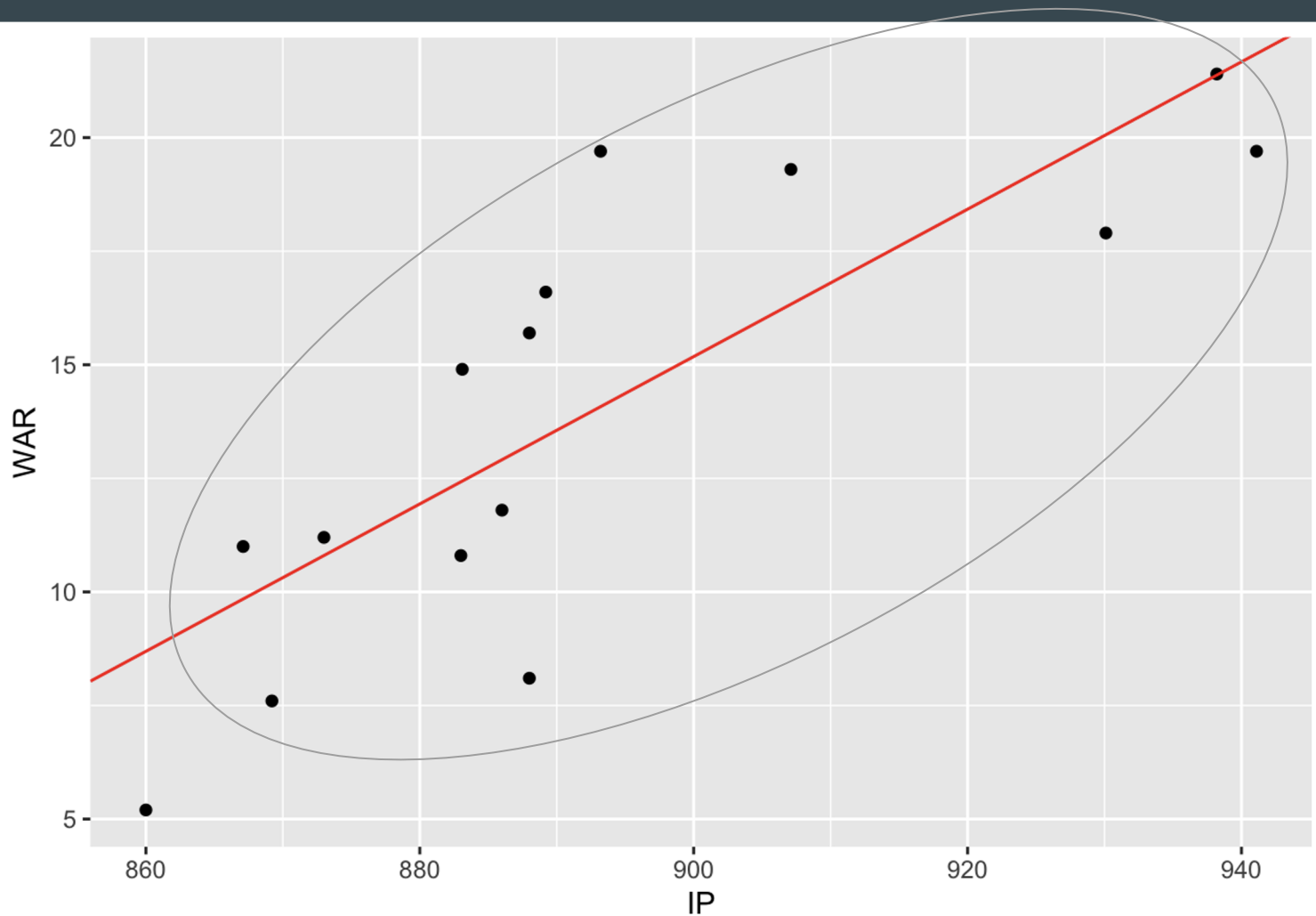
Starting
Pitching

For
starting_heavy
teams (teams
above the
median in
Starting IP)

$R = 0.811$

~

STRONG



Relief Pitching

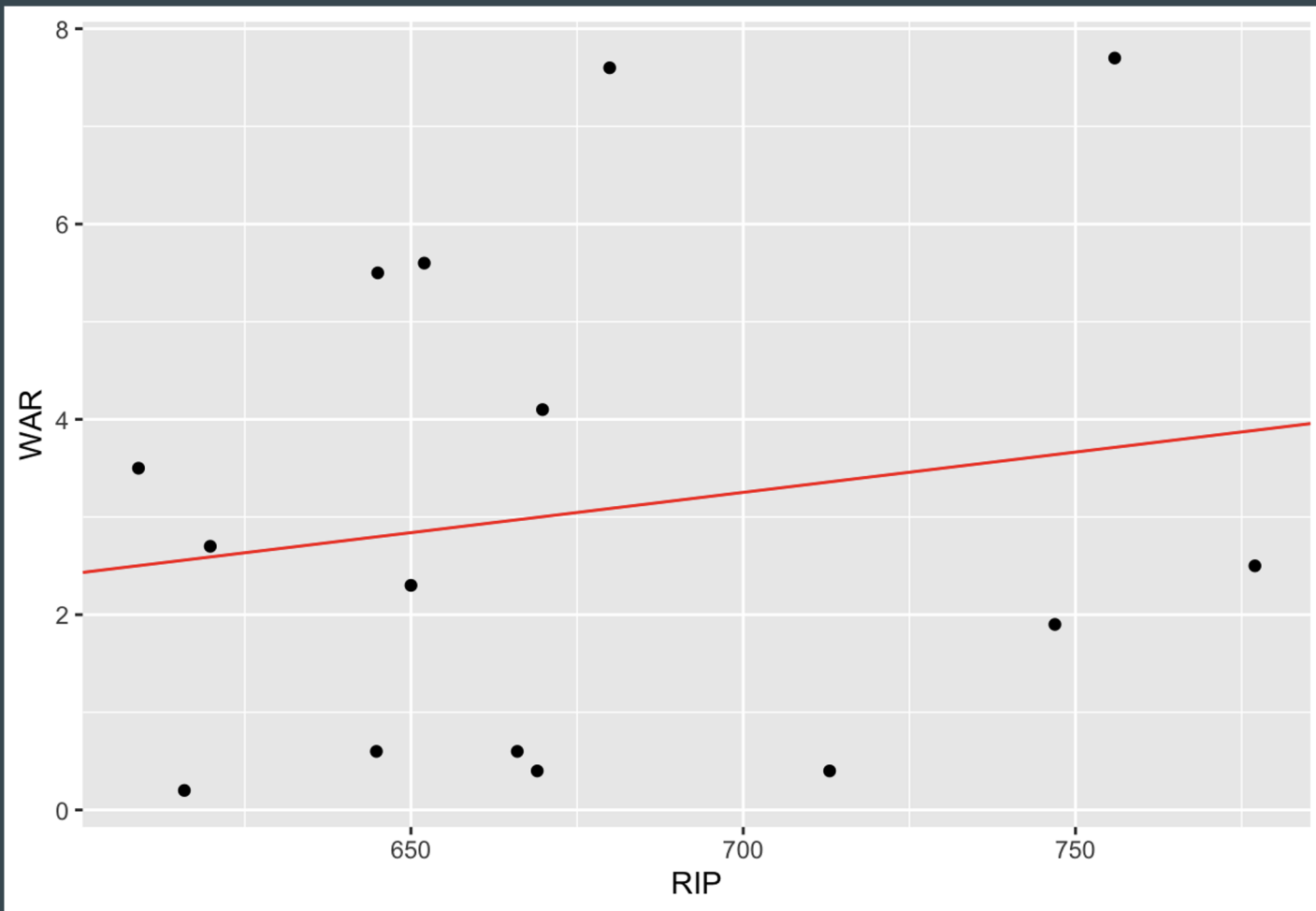
RIP (Relief Innings
Pitched) =

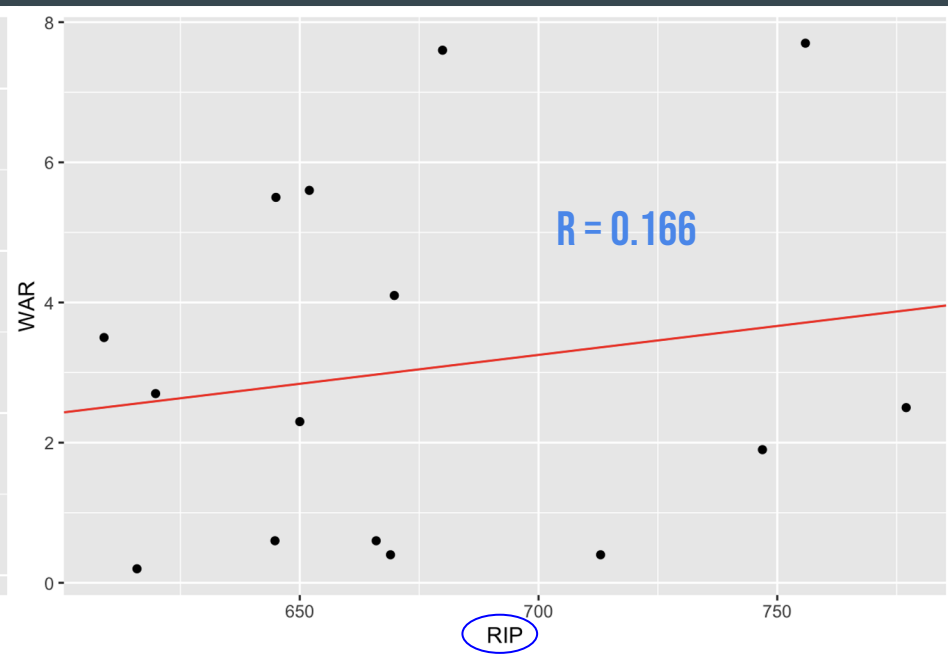
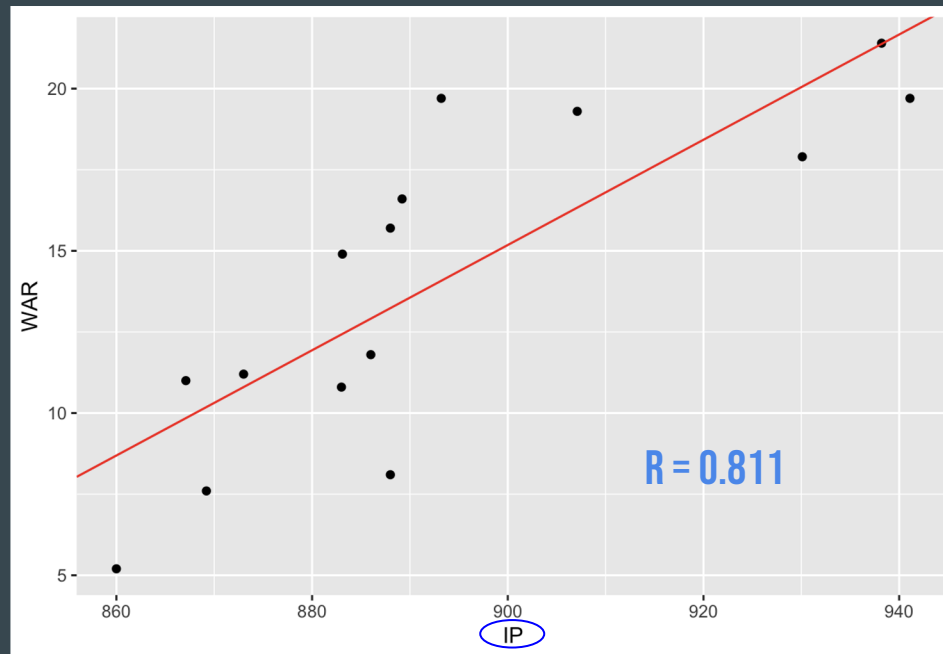
1458 - IP by starters

$R = 0.166$

~

WEAK





THERE'S MORE PRODUCTION AND PREDICTABILITY IN WAR FOR STARTING PITCHING HEAVY TEAMS VS. RELIEF PITCHING HEAVY TEAMS. SO, IT CAN BE DEDUCED THAT THERE IS LESS RISK AND MORE STABILITY IN BUILDING A FRANCHISE AROUND STARTING PITCHING.

Question 4: Is there a correlation between percentage of payroll invested in the pitching category vs. E.R.A.?

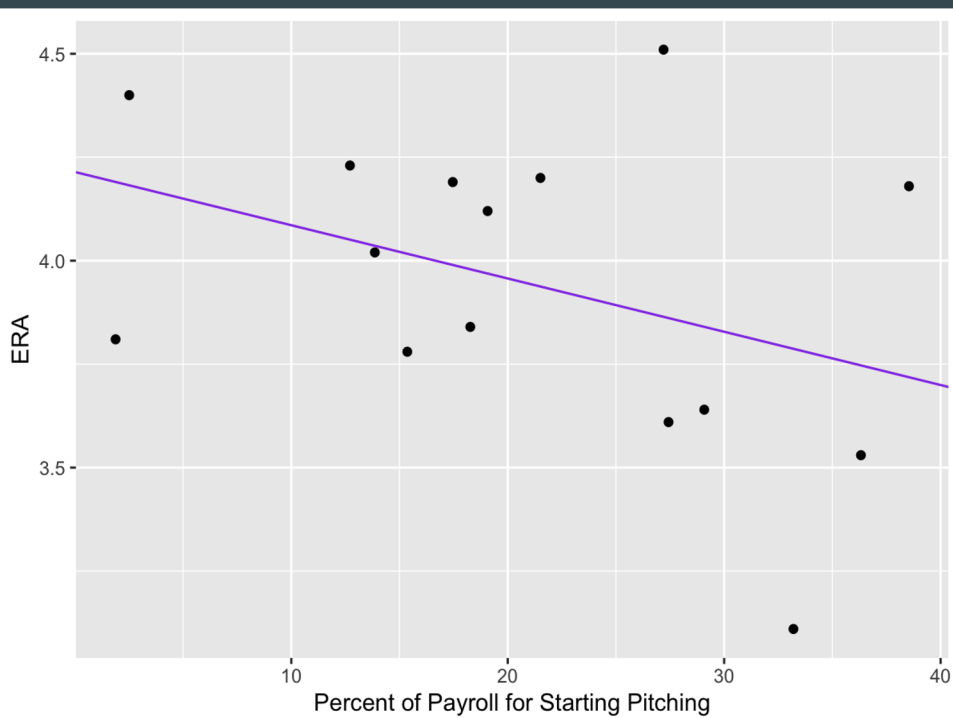


STARTING PITCHER ERA

PERCENTAGE OF PAYROLL FOR SP

SLOPE = -0.0129

R = -0.381



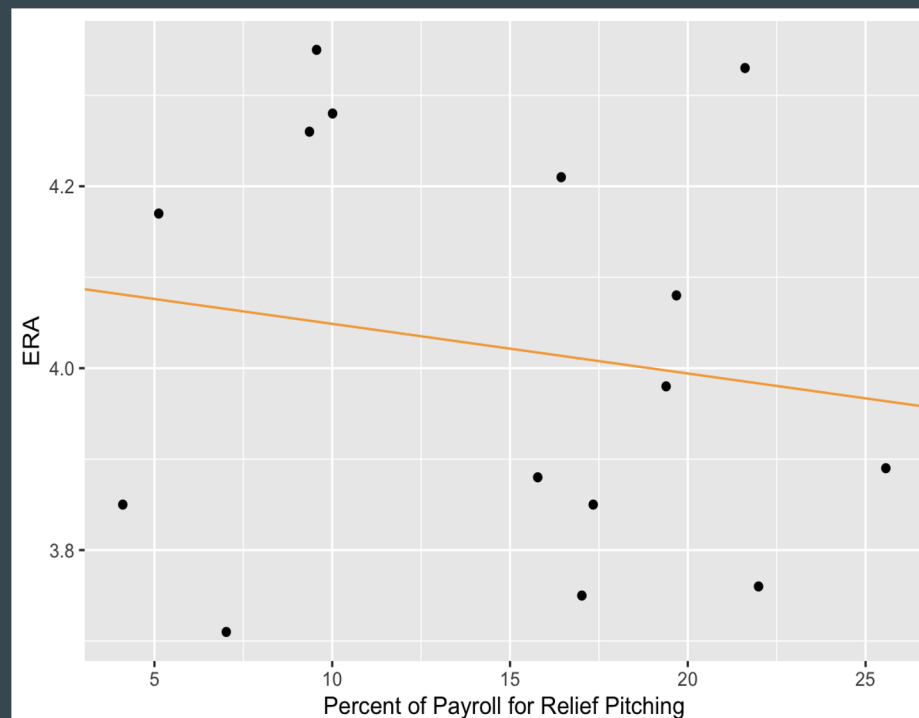
RRELIEF PITCHERS ERA

PERCENTAGE OF PAYROLL FOR RP

SLOPE = -0.00547

R = -0.1602

APPROX. ½ OF THE COR. FOR SP



Question 5: What is the correlation between the top 30 pitchers and their AAV/WAR?



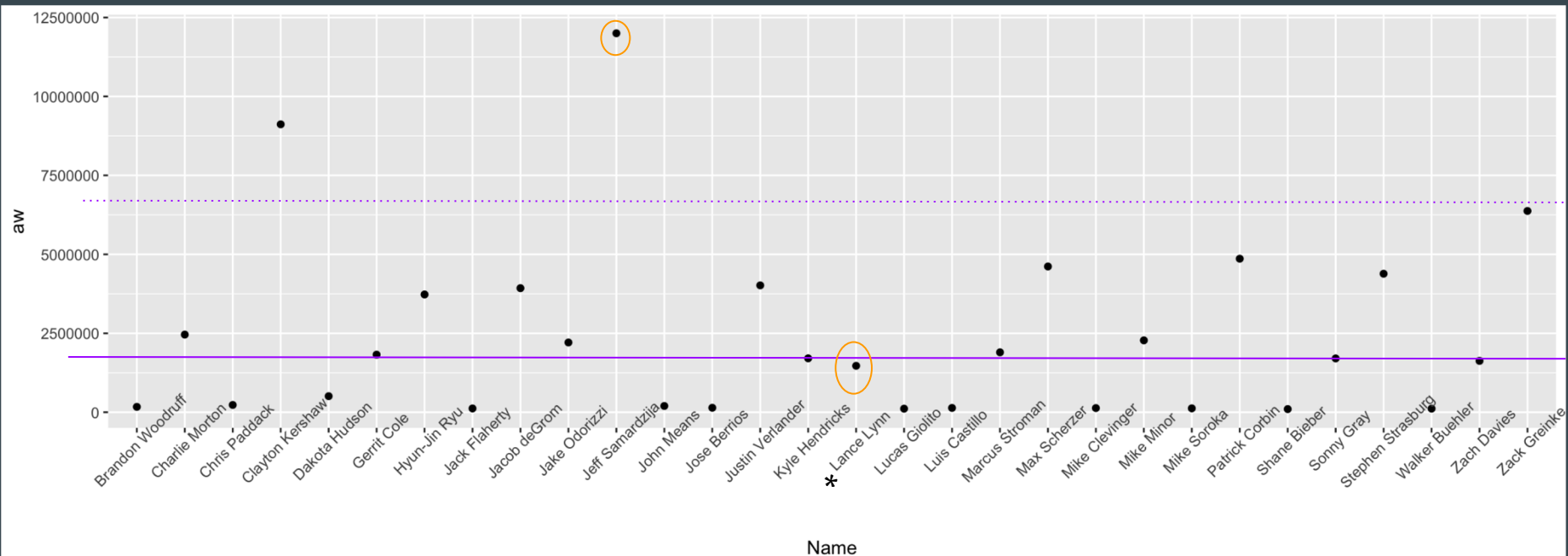
MEDIAN = 1,705,981 \$/WIN

MEAN = 2,409,623 \$/WIN

AAV(\$)/WAR

FOUND A STAT THAT HIGHLIGHTS THE
NUMBER OF DOLLARS PER INDIVIDUAL WIN

STARTING PITCHERS



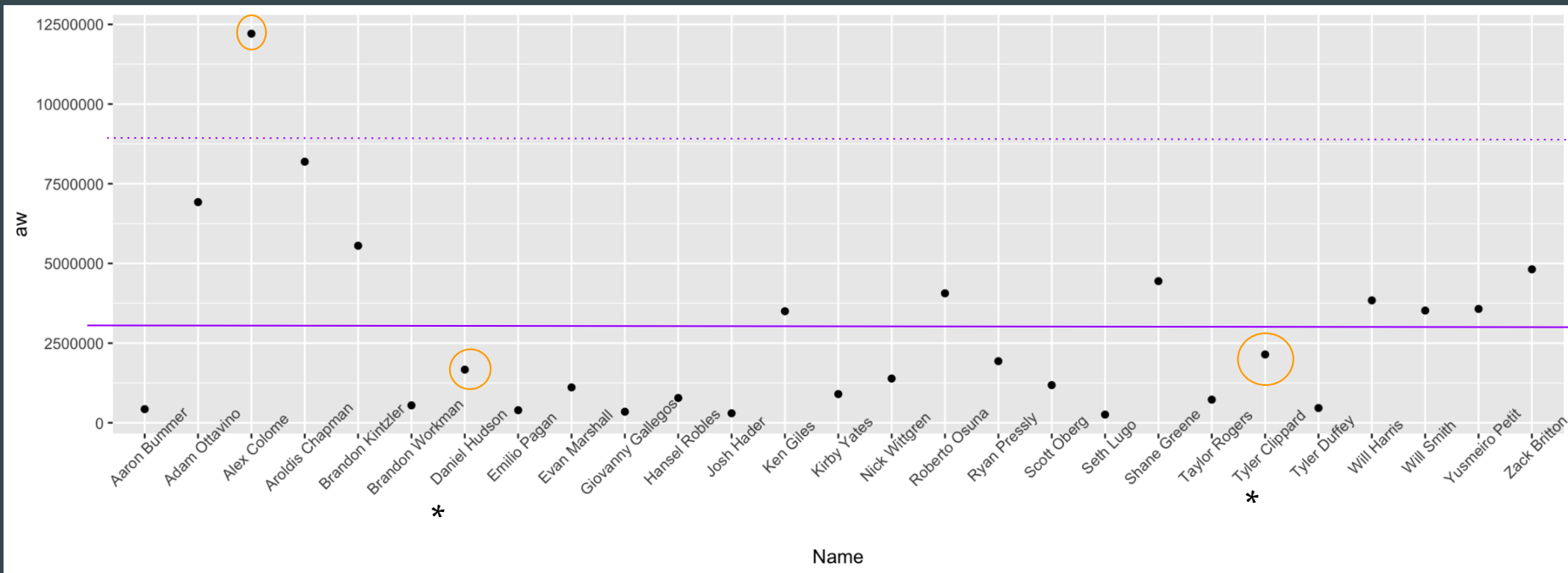
MEDIAN = 1,666,667 \$/WIN

MEAN = 2,784,943 \$/WIN

AAV(\$)/ WAR

FOUND A STAT THAT HIGHLIGHTS THE
NUMBER OF DOLLARS PER INDIVIDUAL WIN

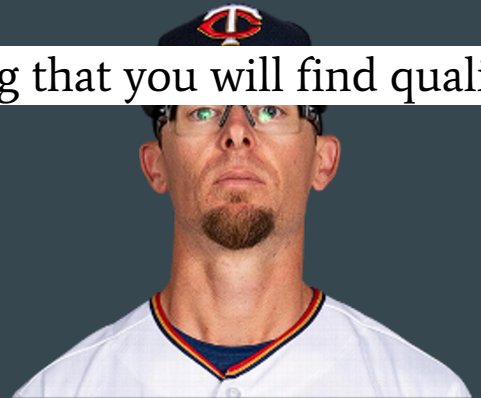
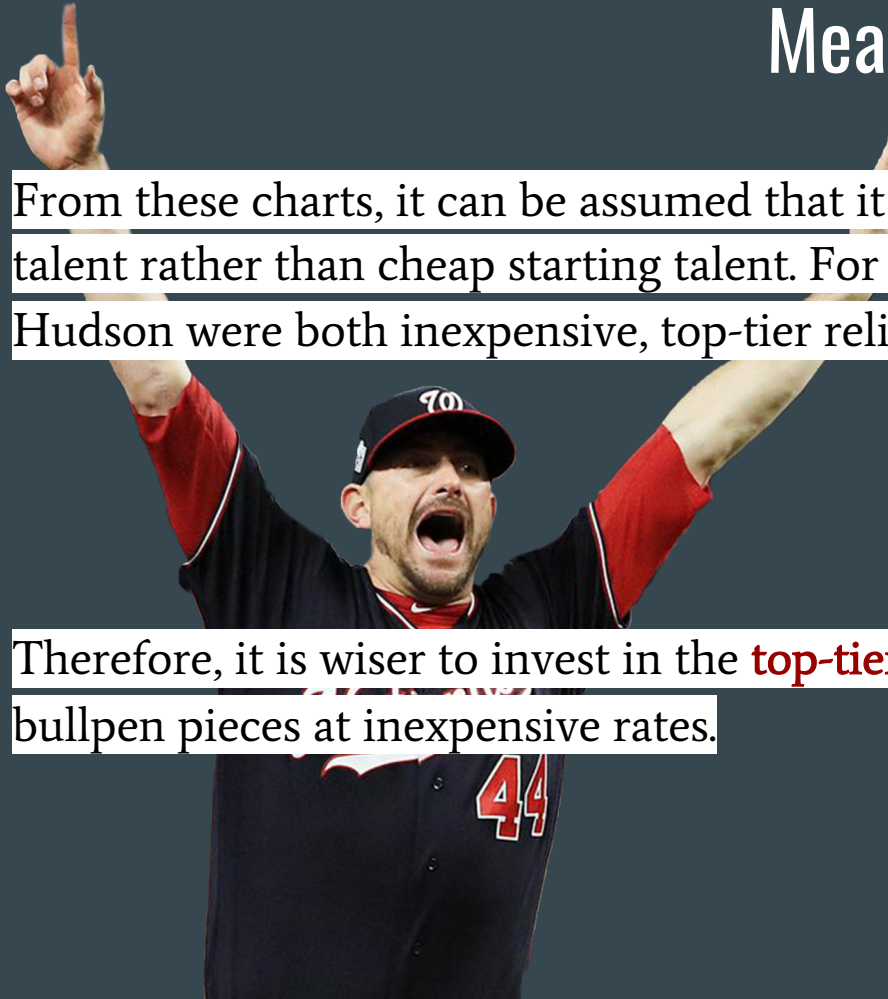
RELIEF PITCHERS



Meaning

From these charts, it can be assumed that it is **easier** and **cheaper** to find top-tier relief talent rather than cheap starting talent. For example, Tyler Clippard and Daniel Hudson were both inexpensive, top-tier relievers in 2019.

Therefore, it is wiser to invest in the **top-tier starters**, trusting that you will find quality bullpen pieces at inexpensive rates.



Outliers



Many teams, such as the **Rays** and **Yankees**, have been able to have the best of both worlds.

The Rays and Yankees were able to set themselves up in such a prime position by “winning” many **blockbuster trades** and having a **terrific draft system**.



This is highlighted in numerous events, such as the **Chris Archer** farewell for the Rays and the short vacation from **Aroldis Chapman** for the Yankees.

The Chris Archer trade (who has now regressed in play with the Pirates), dealt the Rays a top-tier starter in Tyler Glasnow. This was only added to when Charlie Morton signed.

The short-term dealing of Aroldis Chapman to the Cubs, reeling in numerous prospects of and including Gleyber Torres and Adam Warren, proved to benefit their farm system and team to this day.

Last Thoughts

Our decision on studying whether it was more effective to invest in a starting rotation or a bullpen stemmed from this hypothetical ...



OR



The conclusion that starting pitching was much more worthy of an investment than relief pitching stemmed from the continued interpretations through the Percent of Payroll, WAR, E.R.A, and AAV/WAR stats.

We do not mean that a team should lower their search for/continued efforts to build a bullpen (in fact, it should probably be increased because it is imperative to get the first look at a pitcher that is undervalued), it is just that when given the payroll space and options, a team should more often than not choose the top-tier starting pitcher option rather than relief.

Resources

Relief Pitchers 2019 Data:

<https://www.fangraphs.com/leaders.aspx?pos=all&stats=rel&lg=all&qual=0&type=8&season=2019&month=0&season1=2019&ind=0&team=0,ts&rost=0&age=0&filter=&players=0&startdate=2019-01-01&enddate=2019-12-31>

<https://www.baseball-reference.com/leagues/MLB/2019-reliever-pitching.shtml>

<https://blogs.fangraphs.com/the-gradual-spread-of-the-opener/>

<https://www.spotrac.com/mlb/payroll/>

<https://www.usatoday.com/sports/mlb/salaries/2019/team/all/>

<https://www.baseball-reference.com/leagues/MLB/2019-starter-pitching.shtml>

<https://www.baseball-reference.com/teams/TBR/2019-pitching.shtml>