The purpose of this study is to see if all-star trades have impacts on small market teams to give them a chance to win the Finals.

- Does being a small market team affect end-of-year power rankings with respect to the power rankings at the beginning of the season?
- From our analysis, what are the chances of a small market team winning the NBA championship?
- How does an all-star signing or trade impact a team midseason?
- Do specific trades impact the media market rankings? (from preseason to next season)
- How does a team's market size influence the trades or signings they make?
- How does media market size impact a team record (Win vs Loss)

Results:

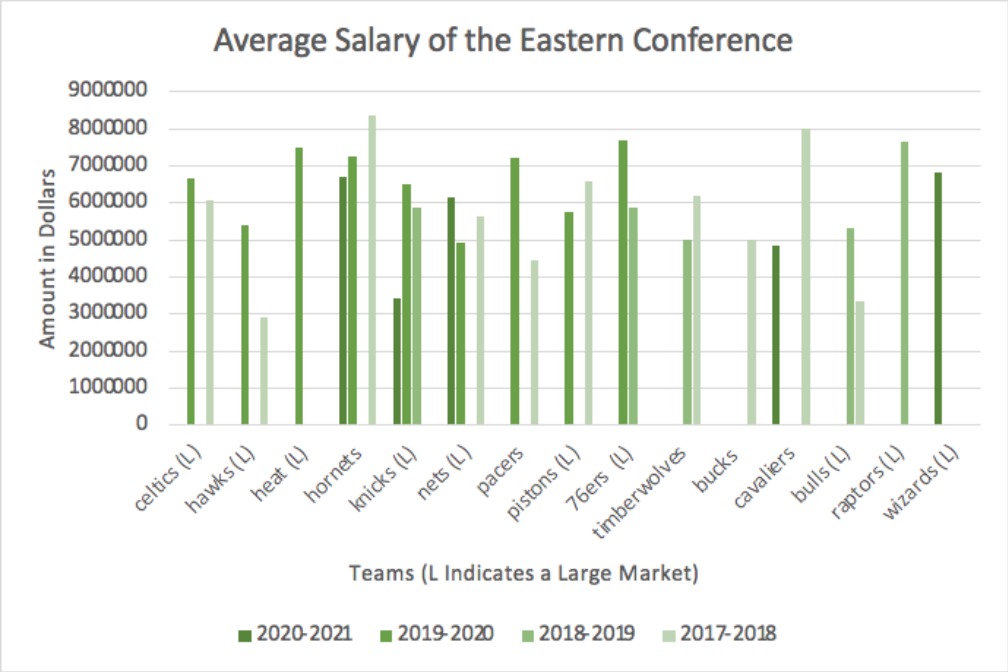
t-Test for Chances of Winning the Finals :
(These odds were generated on sportsoddshistory.com. We looked at the month prior to the all-star trade and then the month after the trade to look at the differences between the two months as the impact that player had on the team. In reality we would love to look at other factors such as injuries or wins and losses at that time of the season, but due to the time constraint that was not a viable option.)

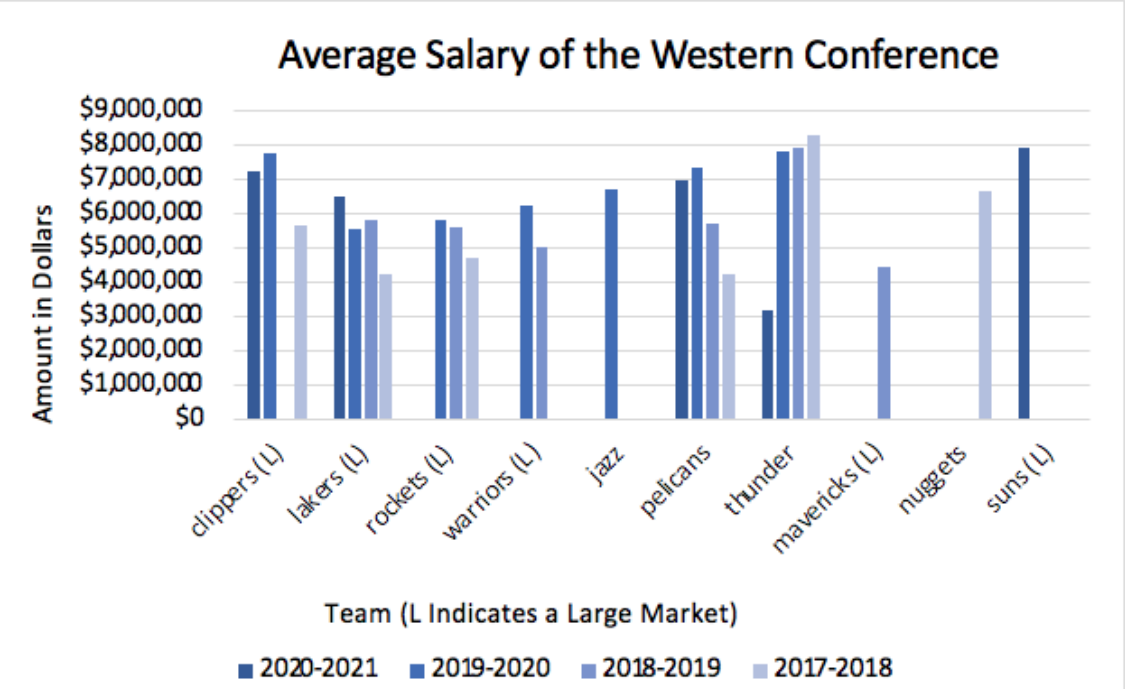
HYPOTHESIS
H_0: Large Market Odds = Small Market Odds
H_a: Large Market Odds $\neq$ Small Market Odds
RESULT
t-Stat=.88 p-value=.37 alpha=.05
i.e.) There is no difference in odds for small vs large market teams

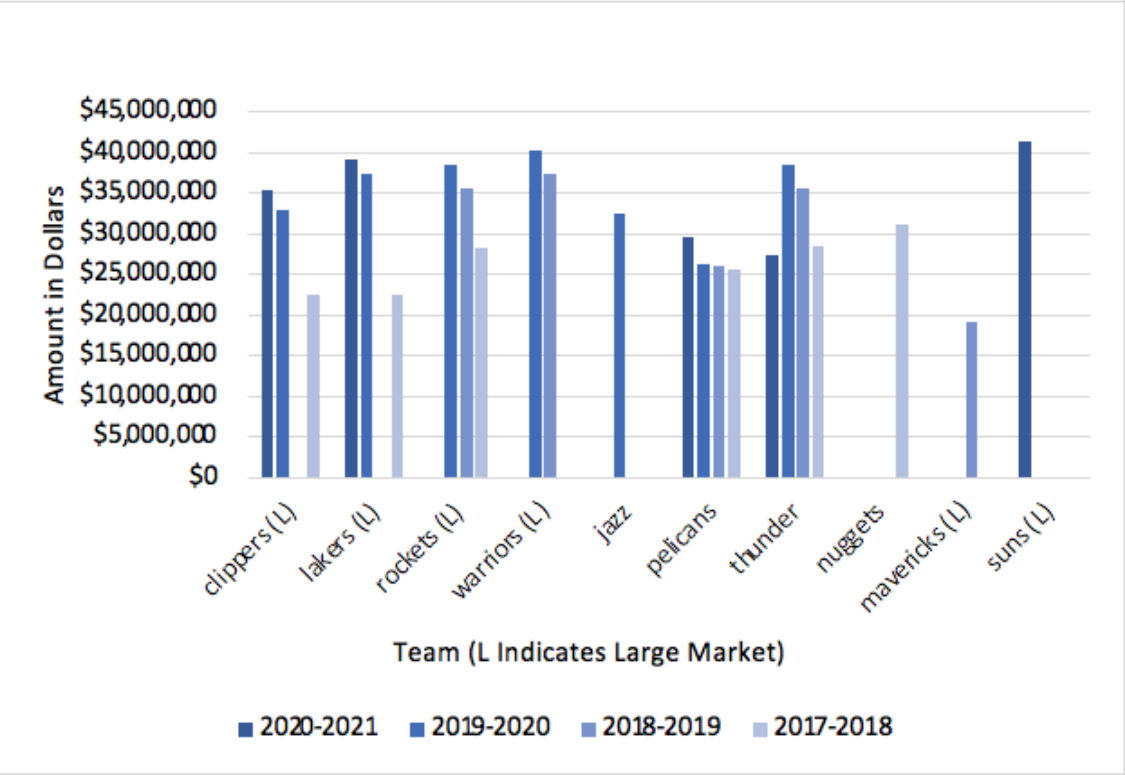
HYPOTHESIS
H_0: Large Market Odds Pre-Trade = Large Market Odds Post Trade
H_a: Large Market Odds Pre-Trade $\neq$ Large Market Odds Post Trade
RESULTS
t-Stat=2.17 p-value=.033 alpha=.05
i.e.) All Star signings in the large market had a significant impact on the odds to win the Finals

HYPOTHESIS
H_0: Small Market Odds Pre-Trade = Small Market Odds Post Trade
H_a: Small Market Odds Pre-Trade $\neq$ Small Market Odds Post Trade
RESULT
t-Stat=1.45 p-value=.16 alpha=.05
i.e.) All Star signings in the small market did not have a significant impact on the odds to win the Finals

Average Salary and Max Contracts between Small and Large Market Teams:
(salaries found on https://www.basketballinsiders.com/)







There is an inconsistent trend in which when the max contract increases the average salary of every other player on the team decreases. This does not seem to be much of an issue within the large market teams.

Media Market Rankings:
(Large and small market teams were identified on reddit as well as Nielsen ratings. The top 15 teams were large while the bottom 15 were small)

Team	2017-2018	2018-2019	2019-2020	2020-2021
Knicks	1	1	1	1
Nets	2	2	2	2
Lakers	3	3	3	3
Clippers	4	4	4	4
Bulls	5	5	5	5
Raptors	6	6	6	6
76ers	7	7	7	7
Mavericks	8	8	8	8
Warriors	9	11	9	9
Hawks	13	12	13	10
Rockets	11	10	11	11
Wizards	10	9	10	12
Celtics	12	13	12	13
Suns	14	14	14	14
Timberwolves	16	16	16	15***
Pistons	15	15	15	16***
Nuggets	18	18	18	17
Magic	19	19	19	18
Heat	17	17	17	19
Cavaliers	20	20	20	20
Kings	21	21	21	21
Trail Blazers	23	22	23	22
Hornets	22	23	22	23
Pacers	24	24	24	24
Jazz	26	25	25	25
Spurs	25	26	26	26
Bucks	27	27	27	27
Thunder	28	28	29	28
Pelicans	29	30	28	29
Grizzlies	30	29	30	30

*** Indicates a switch from large to small, or small to large markets.
There was only one transition between small and large markets and that was in 2020-2021 between the Timberwolves and the Pistons. Other than that it is nearly impossible to transition between the two markets.

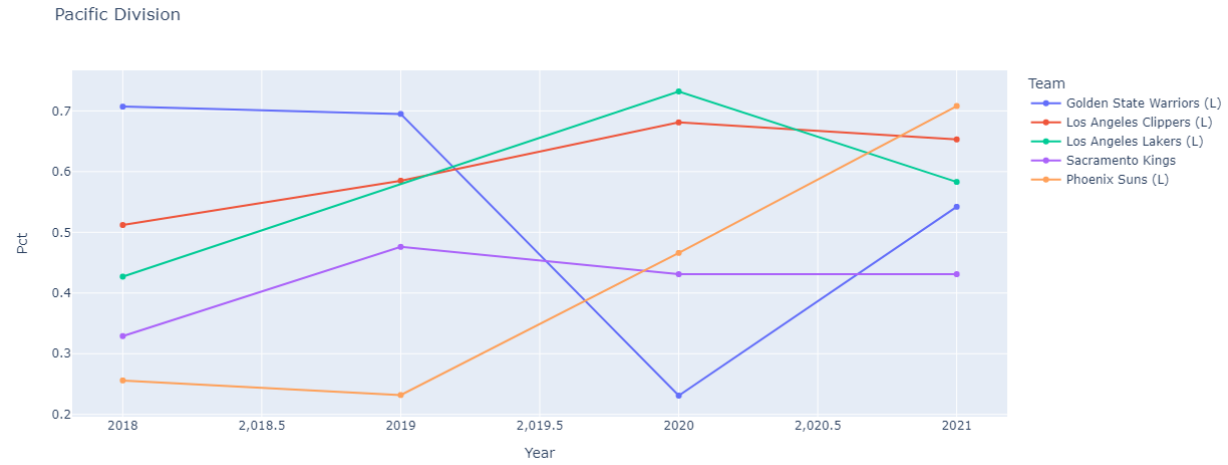
Power Rankings:
(found on espn.com)

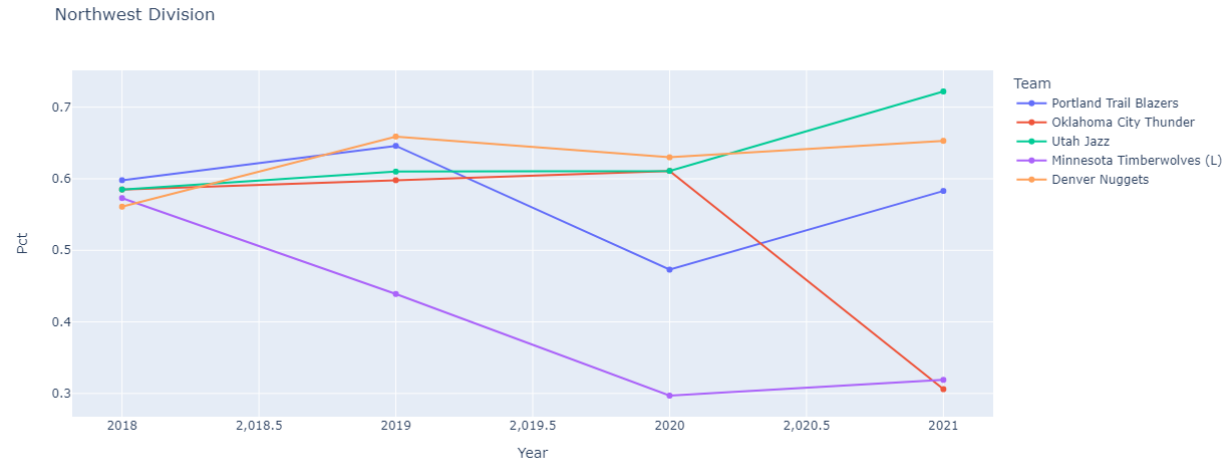
Rank	2017 Preseason	Ranking Delta	2018 Preseason	Ranking Delta	2019 Preseason	Ranking Delta	2020 Preseason	Ranking Delta
1	**Warriors**	-2	**Warriors**	0	**Clippers**	-1	**Lakers**	-3
2	Cavaliers	-3	**Celtics**	0	Bucks	1	Bucks	1
3	**Rockets**	2	**Rockets**	-1	**Sixers**	-4	**Nets**	1
4	Thunder	-8	**Lakers**	-4	**Lakers**	1	**Clippers**	-5
5	Spurs	-6	**Sixers**	-1	**Rockets**	0	Heat	-6
6	**Celtics**	0	**Raptors**	3	Nuggets	-2	**Mavericks**	-4
7	**Wizards**	-10	Thunder	0	Jazz	-4	Nuggets	0
8	Nuggets	-6	Pacers	-6	**Warriors**	-22	**Celtics**	-5
9	Timberwolves	-4	Jazz	4	**Celtics**	3	**Sixers**	4
10	**Raptors**	8	**Wizards**	-6	Blazers	-6	**Raptors**	-9
11	**Clippers**	-8	Nuggets	1	**Nets**	-8	Blazers	-5
12	Jazz	4	Pelicans	0	**Raptors**	7	Jazz	6
13	Bucks	-3	Blazers	2	Spurs	-7	**Warriors**	1
14	Blazers	7	Spurs	-1	Heat	5	**Suns**	11
15	Pelicans	5	Bucks	6	**Mavericks**	5	**Rockets**	-14
16	Grizzlies	-13	Timberwolves	-2	Pelicans	1	Pelicans	-5
17	Hornets	-3	**Pistons**	0	Pacers	4	Pacers	0
18	Heat	3	Heat	5	Kings	0	Grizzlies	3
19	**Mavericks**	-7	**Clippers**	-2	**Pistons**	-7	**Wizards**	-2
20	**Sixers**	16	**Mavericks**	1	Timberwolves	-8	**Hawks**	12
21	**Pistons**	3	Grizzlies	-2	Magic	7	Spurs	-1
22	**Lakers**	1	Cavaliers	0	Thunder	10	Magic	-6
23	Kings	0	Hornets	3	**Bulls**	-2	**Timberwolves**	-2
24	Magic	-4	**Bulls**	-1	**Hawks**	1	**Bulls**	1
25	**Suns**	-5	Magic	-1	**Wizards**	3	Hornets	7
26	Pacers	17	**Suns**	-2	Grizzlies	9	Kings	2
27	**Knicks**	3	**Knicks**	0	Cavaliers	-2	Pistons	1
28	**Nets**	6	**Nets**	4	**Suns**	7	**Knicks**	14
29	**Hawks**	2	Kings	-1	**Knicks**	2	Cavaliers	2
30	**Bulls**	5	**Hawks**	1	Hornets	6	Thunder	1

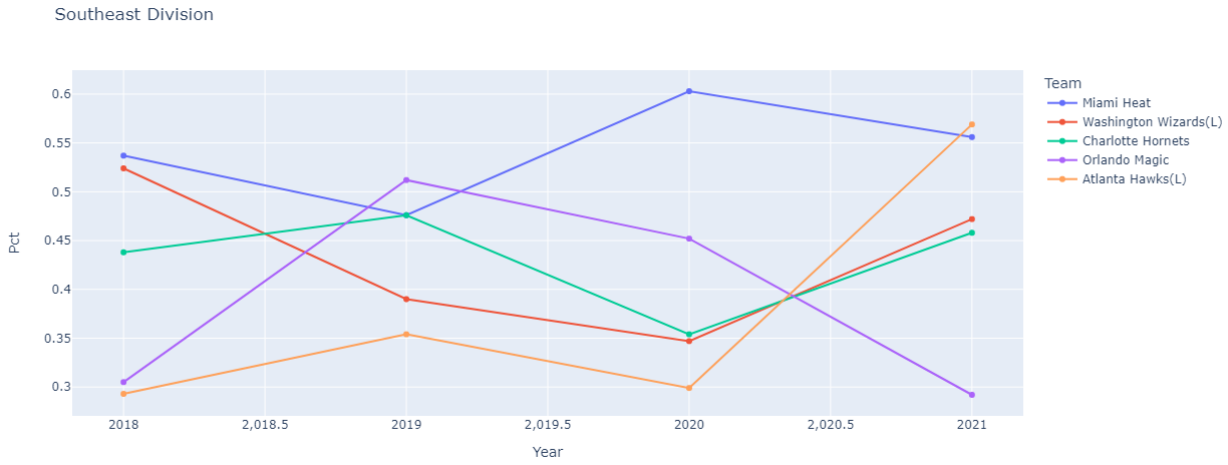
The rank at the front applies to all teams as the base line. The – indicates a team moved down rankings while a positive number means they moved up. A zero means they did not move. The teams are reordered every year to accommodate for the new season. The bolded teams are the large market teams. One thing noticed is that every year at the beginning of the season there is a large market team listed at number one.

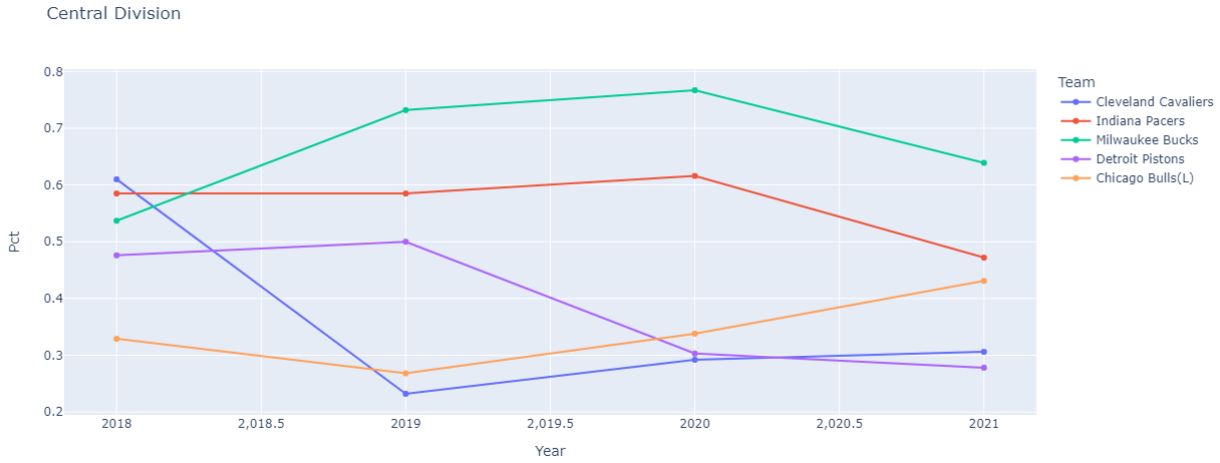
Wins vs Losses:
(found on the open web)

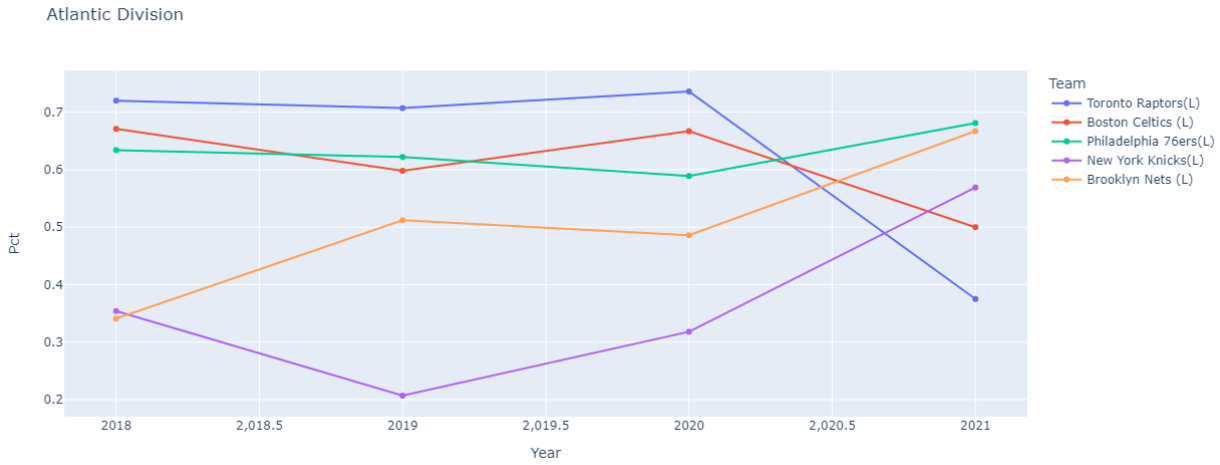
(L indicates a large market team)











There does not appear to be a trend within the divisions for wins and losses over the years. I wish we could've placed the all-star trades and signings with the years to better try to identify a pattern with the teams.

Through this analysis it was identified that there is no statistical advantage of being a large market team when it comes to winning the Finals. Through a t-test we came to the conclusion that the only advantage a large market team has over a small market team is that after they pick up or trade for an all-star their odds jump more than the small market, but in the end the odds are relatively the same.

Additionally, small market teams spend about the same on all stars as large market teams do. Bar charts show the average amount in salary and max cap contracts are within a few hundred thousand of each other in most cases. A t-test could not be performed as normality could not be established with this small of a sample size. One trend to notice is that the majority of teams that spend an increasing amount on their max contract over the four years typically will have a decreasing average salary. One team that defies this is the Pacers. They spent the same amount on their max contract both years, but in 2019-2020 their average salary skyrocketed from 2017-2018, this is caused by adding more all-stars and higher paid players to the roster and spending closer to that cap on more people. The more bars the team had affiliated with them the more years they traded for or signed an all-star.

There were multiple instances of an increase in rank in the media market from between all seasons. However, there was only one change in rank that took a small market team to be large and vice versa. This was between the Timberwolves and the Pistons. The Timberwolves finished 15 while the Pistons finished 16. All other increases or decreases in ranking did not cause a change in the large or small market pool of teams.

Regarding wins and losses the Pacific Division seems to be the strongest and they are made up of all large market teams except one who finished below .500. Other than that there does not appear to be a trend regarding small or large market teams performing better throughout the years.

Power rankings do not appear to have a correlation to market size. There is an equal chance the large market or the small market will move up or down. However a large market team landed in the number one spot starting the season all four years.