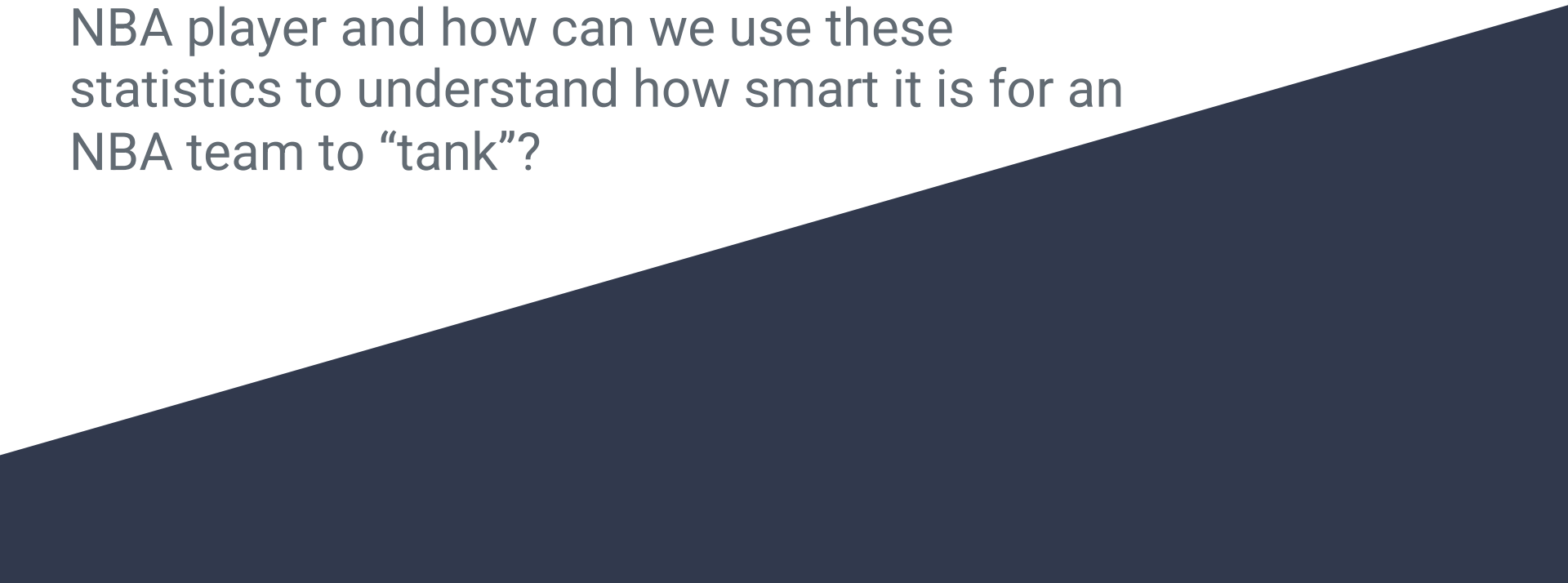# Tanking Strategy and the Value of NBA Draft Picks

By: Matthew Sherman, Ryan Shimek, Ezra Troy and Jason Kim

Research Question

What statistics best measure the value of an NBA player and how can we use these statistics to understand how smart it is for an NBA team to "tank"?

Current Statistics Used to Measure Player Performance in NBA

VORP: Value Over Replacement Player

- The term "Replacement Player" isn't clearly defined
- Undervalues players that excel in man defense
    - Bruce Bowen has an 15.2 career VORP (for comparison, Kyle Korver, a liability on defense, has a career VORP of 21) despite Bowen being on the first team all-defense 5 times

PER: Player Efficiency Rating

- Doesn't distinguish between assisted and unassisted field goals.
- JaVale McGee had a PER of 22.39 this season while DeMar DeRozan's was 21.10.
- Values player efficiency but is not a stat that values overall quality or contribution to a team

Win Shares

- On offense, Win Shares over values player efficiency. (Kobe Bryant Win Shares = 172.6, Reggie Miller Win Shares =174.4)
- Chris Paul has the highest Win Shares per 48 minutes in NBA History at 0.2512

In the NBA, there is no single statistic that perfectly values players contributions to a team. With that said, VORP, PER and Win Shares are considered to be the three best statistics at doing this.

The JERM Statistic

J.E.R.M.: Jason, Ezra, Ryan, Matthew

Exploring the Optimization of Current stats used to measure Player Performance

The JERM Statistic

What is the JERM Statistic?

> JERM is a stat that attempts to evaluate the long term performance of an NBA player by combining VORP, Win Shares and PER.

How did we calculate JERM?

1. We started by standardizing each of the three statistics for all of the players among their respective draft pick slot
2. Next, we combined the three standardized units by finding the mean of the three
3. From here, we ranked all of the players by this new number we called the JERM Statistic

Pros and Cons of the New Stat

Pros	Cons
● The JERM stat is able to mitigate the issues of PER, Win Shares and VORP resulting in 3 minor flaws rather than 1 major flaw	● It amplifies certain statistics that are accounted for or even overvalued in all 3 stats ● It can be swayed by each weakness of PER, VORP and Win Shares

Main Application of the JERM Statistic

- We found JERM useful in evaluating picks in the NBA Draft based on the value they provided to their team relative to other players picked in the same slot

|	Year	Rk	Tm	Player	Yrs	WS_per_Year	VORP_per_Year	PER	WS_SD_Player_Diff	VORP_SD_Player_Diff	PER_SD_Player_Diff	Overall
992	1985	13	UTA	Karl Malone	19	12.347368	5.3947368	23.9	3.87006108	4.10183915	3.13521440	3.7023715
991	2013	27	DEN	Rudy Gobert	5	7.700000	3.0200000	20.6	3.68903116	3.99086182	2.92423603	3.5347097
990	1981	20	PHO	Larry Nance	13	8.430769	3.6846154	19.9	3.73370680	4.27715039	2.29560458	3.4354873
989	1984	16	UTA	John Stockton	19	10.931579	3.4684211	21.8	4.56665535	4.04727143	1.65899609	3.4243076
988	2005	4	NOH	Chris Paul	13	12.676923	5.8384615	25.6	3.47740172	3.37230433	3.22380149	3.3578358
987	2009	7	GSW	Stephen Curry	9	10.366667	5.1333333	23.8	3.37899896	3.60840388	2.88953487	3.2923126
986	1983	14	POR	Clyde Drexler	15	9.040000	5.0400000	21.1	3.13466237	3.97388049	2.44925270	3.1859319
985	1984	3	CHI	Michael Jordan	15	14.266667	6.9600000	27.9	3.08478096	3.43903741	2.71945165	3.0810900
984	2012	6	POR	Damian Lillard	6	9.700000	4.0833333	21.0	3.23645479	3.07137833	2.65062958	2.9861542
983	2007	2	SEA	Kevin Durant	11	11.836364	4.6818182	25.3	3.07326336	2.77354345	2.43159900	2.7594686
982	2011	15	IND	Kawhi Leonard	7	8.042857	3.6857143	22.1	2.66205711	3.37453181	2.17033780	2.7356422
981	2008	4	SEA	Russell Westbrook	10	9.010000	5.6000000	23.9	1.96195066	3.19803297	2.65767049	2.6058847
980	1996	13	CHH	Kobe Bryant	20	8.635000	3.6050000	22.9	2.37448239	2.60185338	2.81932378	2.5985532
979	1984	5	PHI	Charles Barkley	16	11.075000	5.8437500	24.6	2.61763711	2.97988674	2.10418788	2.5672372
978	2003	1	CLE	LeBron James	15	14.626667	8.3266667	27.7	2.43014946	3.17976208	1.92420654	2.5113727
977	2013	15	MIL	Giannis Antetokounmpo	5	7.780000	3.4400000	20.3	2.54536823	3.12708299	1.76724841	2.4798999
976	2001	28	SAS	Tony Parker	17	6.494118	1.5588235	18.3	3.02706922	2.69234881	1.71868428	2.4793674
975	2003	29	DAL	Josh Howard	10	3.800000	1.0300000	16.7	2.80545792	2.99154442	1.63881480	2.4786057
974	1987	11	IND	Reggie Miller	18	9.688889	3.5111111	18.4	3.06890504	2.90835457	1.35031485	2.4425248
973	1987	22	BOS	Reggie Lewis	6	6.483333	2.1833333	17.1	2.86087592	2.92944986	1.36394378	2.3847565
972	1989	26	LAL	Vlade Divac	16	6.025000	2.8312500	17.7	2.14116588	3.32879924	1.41252837	2.2941645
971	1989	12	NJN	Mookie Blaylock	13	5.523077	2.9923077	16.8	2.12575398	3.43602641	1.26878906	2.2768565
970	1989	17	SEA	Shawn Kemp	14	6.392857	1.9500000	19.1	2.80774788	2.09144408	1.91795346	2.2723818
969	1998	10	BOS	Paul Pierce	19	7.894737	3.2368421	19.7	2.34594595	2.45026414	1.94688646	2.2476989
968	1988	19	NYK	Rod Strickland	17	5.047059	1.8176471	18.0	2.15007838	2.81820777	1.73582640	2.2347042
967	1998	9	MIL	Dirk Nowitzki	20	10.305000	3.3550000	22.6	2.59650842	1.91838211	2.13664257	2.2171777
966	2008	25	HOU	Nicolas Batum	10	5.040000	2.5100000	15.2	2.46542906	3.21864291	0.91736013	2.2004774

The Value of Tanking

We explore the value of each draft slot as well as the chances for teams to achieve the most valuable picks in the draft with their Winning Percentage

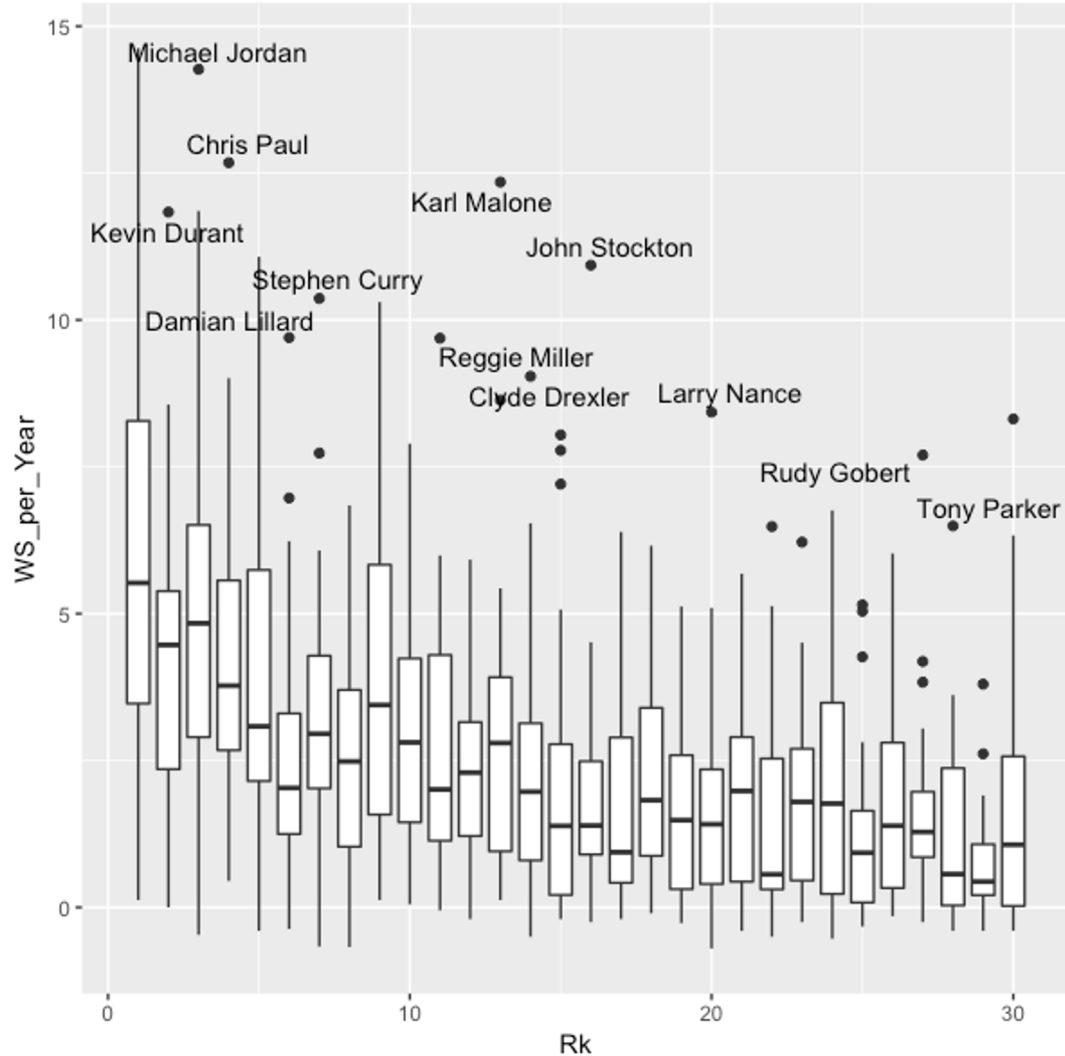# Average VORP/Year of players selected at each pick

- Shows a general downward trend in the quality of players selected in the NBA
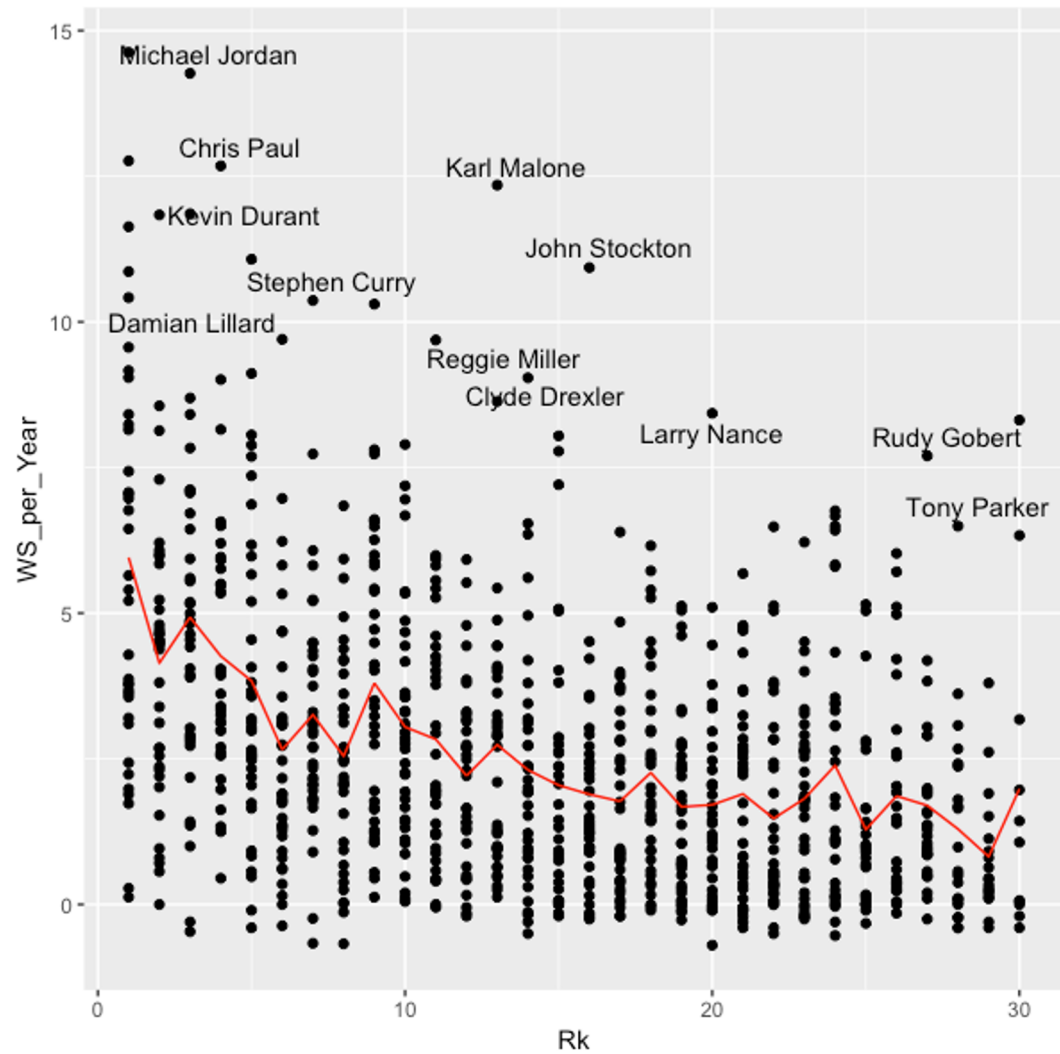- The line flattens out significantly after the 10th overall pick
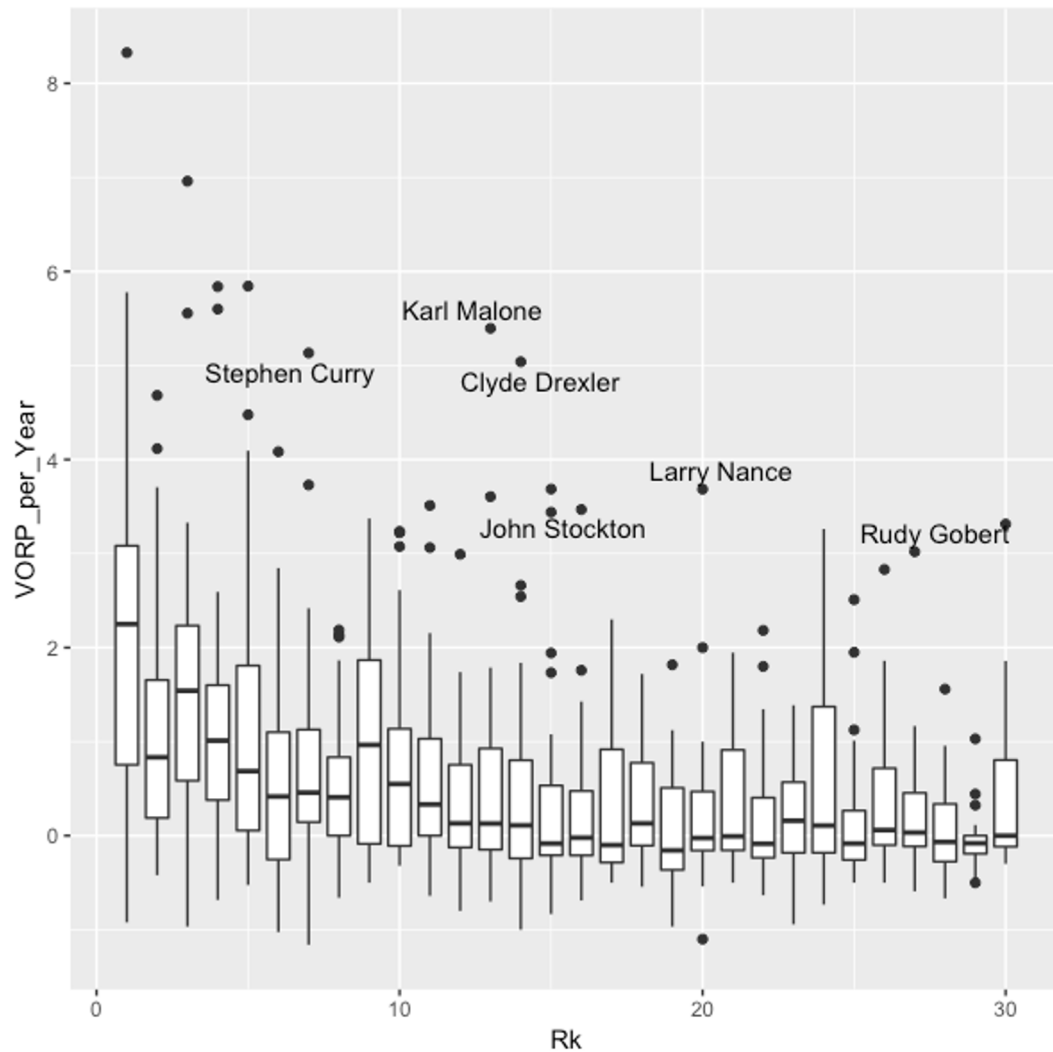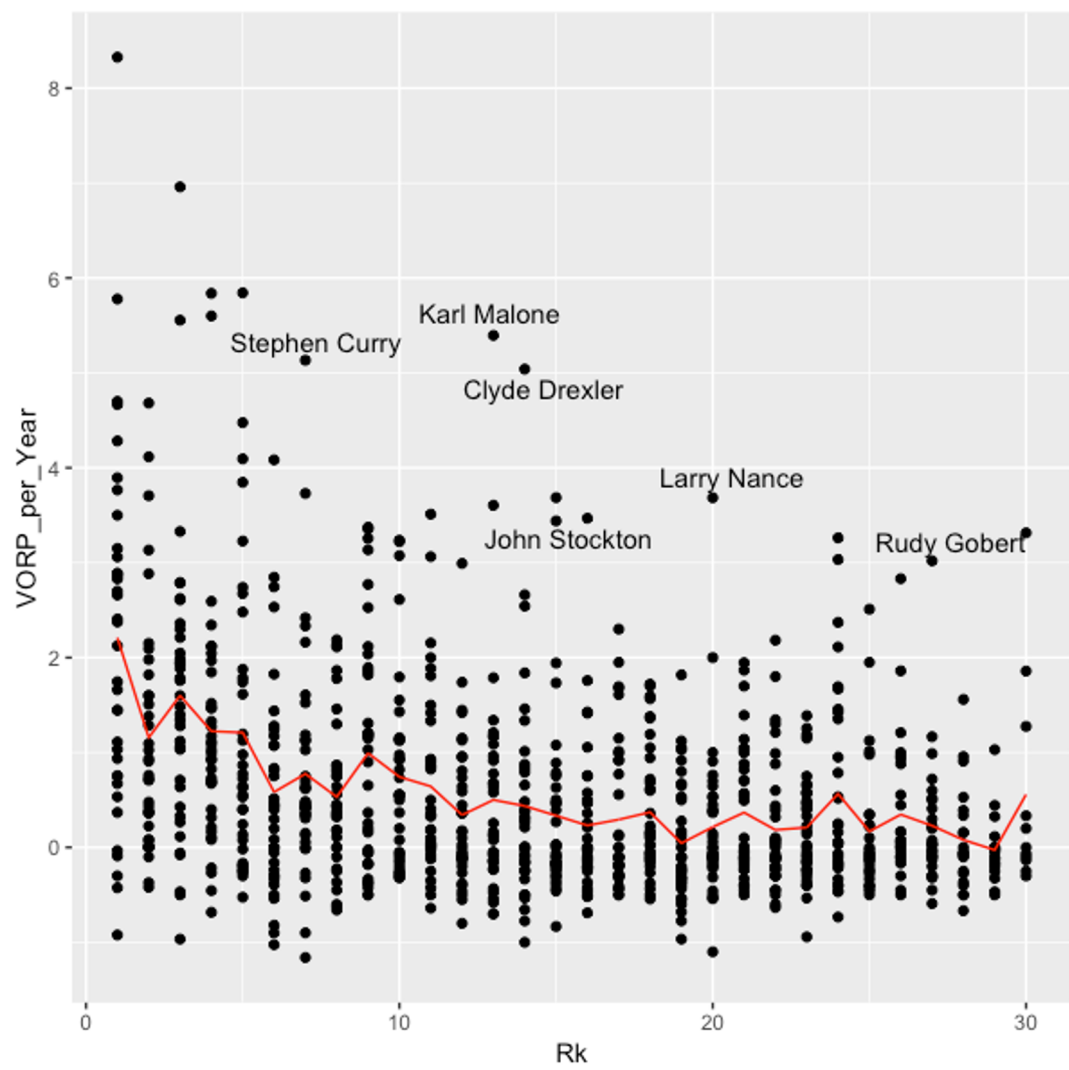
# Average Win Shares/Year of players selected at each pick

- The downward trend continue but shows a much less uniform trend
- The last 15 picks don't follow as strict of a trend because of the flaw in Win Shares
- Teams later in the draft have much higher win totals boosting the win shares of their players
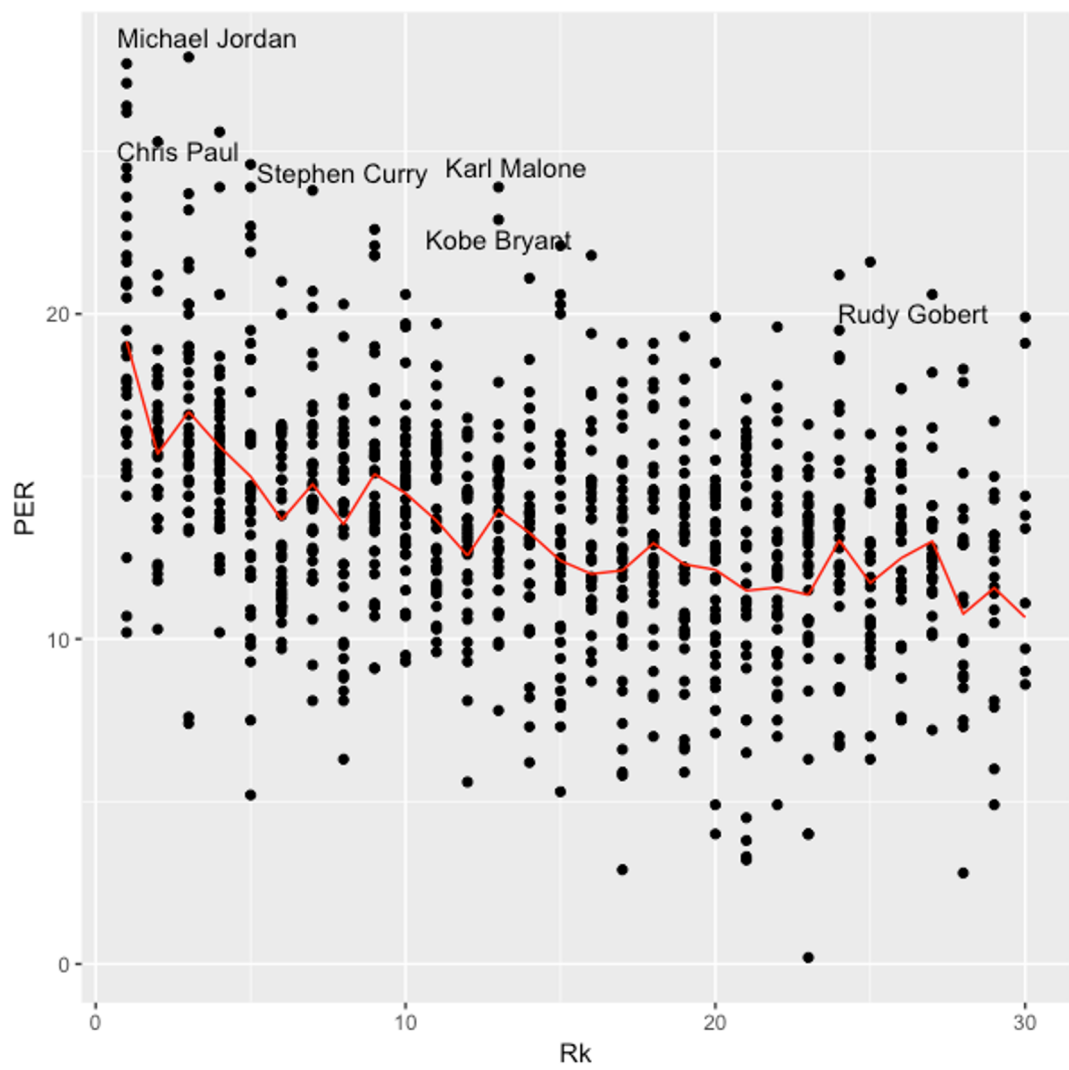
Average PER of players selected at each pick

- There is a downward trend from the 1st to the 10th pick
- The line flattens out significantly after the 10th overall pick
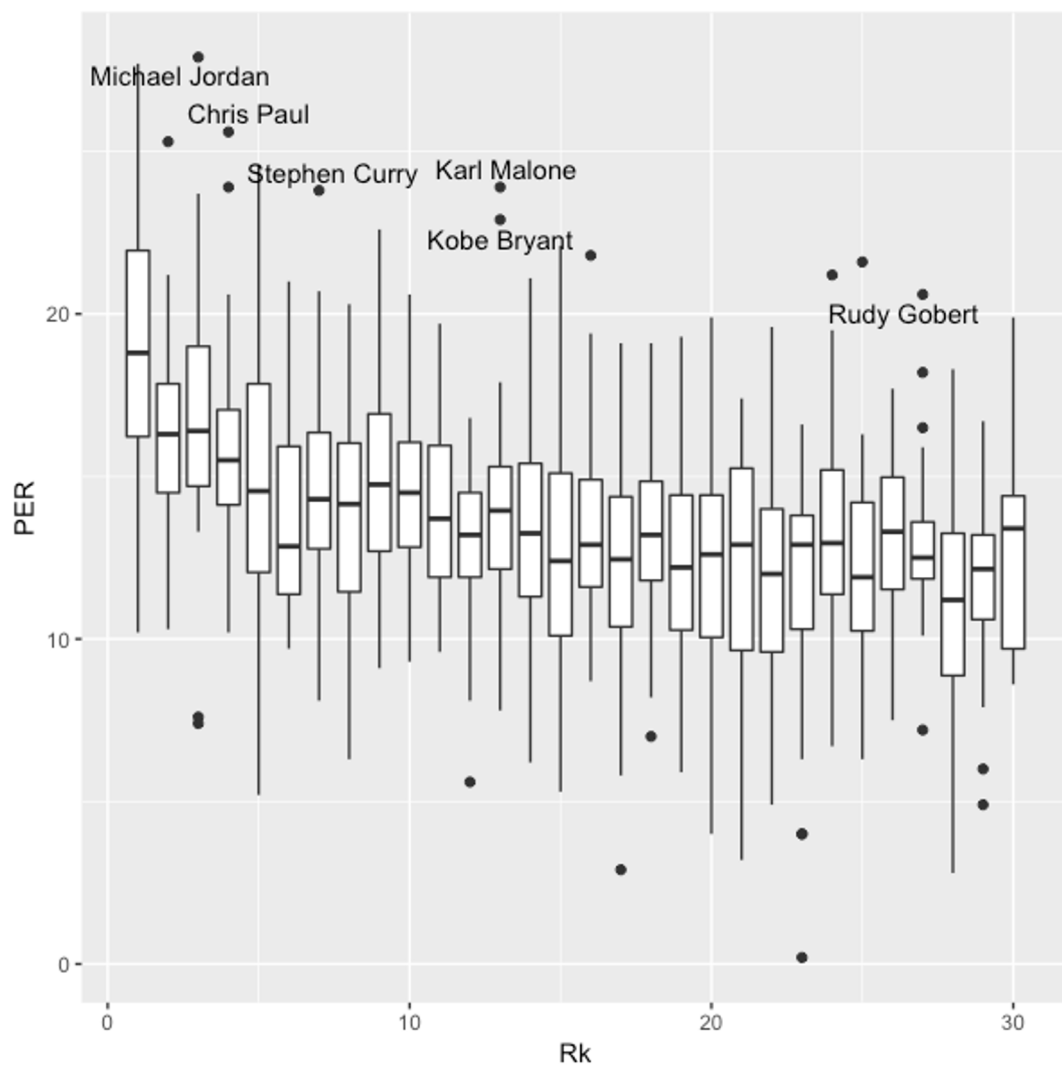
Conclusions

- 1st overall
  - Generally better
- Picks 2-5 are pretty similar
  - However, dip at 2 due to many busts (Hasheem Thabeet, Derrick Williams, Sam Bowie)
- Drops off at Pick 10 after an increase in Pick 9
  - (Dirk Nowitzki, Tracy McGrady)
- Sudden increases
  - 13 (Karl Malone and Kobe Bryant)
  - 18 (Joe Dumars, Mark Jackson, David West and James Posey)
  - 24 (Kyle Lowry, Terry Porter and Arvydas Sabonis)
  - 27 (Rudy Gobert and Elden Campbell)

Seed	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	Chances of top 10 pick
30	0.14	0.134	0.127	0.12	0.479	0	0	0	0	0	0	0	0	0	1
29	0.14	0.134	0.127	0.12	0.278	0.2	0	0	0	0	0	0	0	0	0.999
28	0.14	0.134	0.127	0.12	0.148	0.26	0.07	0	0	0	0	0	0	0	0.999
27	0.125	0.122	0.119	0.115	0.072	0.257	0.167	0.022	0	0	0	0	0	0	0.999
26	0.105	0.105	0.106	0.105	0.022	0.196	0.267	0.087	0.006	0	0	0	0	0	0.999
25	0.09	0.092	0.094	0.096	0	0.086	0.298	0.206	0.037	0.001	0	0	0	0	1
24	0.075	0.078	0.081	0.085	0	0	0.197	0.341	0.129	0.013	0	0	0	0	0.999
23	0.06	0.063	0.067	0.072	0	0	0	0.345	0.321	0.067	0.004	0	0	0	0.995
22	0.045	0.048	0.052	0.057	0	0	0	0	0.507	0.259	0.03	0.001	0	0	0.968
21	0.03	0.033	0.036	0.04	0	0	0	0	0	0.659	0.19	0.012	0	0	0.798
20	0.02	0.022	0.024	0.028	0	0	0	0	0	0	0.776	0.126	0.004	0	0.094
19	0.015	0.017	0.019	0.021	0	0	0	0	0	0	0	0.861	0.067	0.001	0.072
18	0.01	0.011	0.012	0.014	0	0	0	0	0	0	0	0	0.929	0.023	0.047
17	0.005	0.006	0.006	0.007	0	0	0	0	0	0	0	0	0	0.976	0.024

Lottery odds for each lottery team

Seeding	Average Wins	Average Losses	Average Win Percentage	Seeding	Average Wins	Average Losses	Average Win Percentage
1	63	19	0.774	16	42	38	0.515
2	60	22	0.735	17	40	42	0.489
3	59	23	0.714	18	38	44	0.465
4	55	27	0.675	19	38	44	0.463
5	55	27	0.671	20	35	47	0.428
6	53	29	0.643	21	35	47	0.421
7	52	30	0.631	22	32	50	0.387
8	51	31	0.625	23	31	51	0.373
9	48	34	0.59	24	30	52	0.362
10	48	34	0.588	25	28	54	0.343
11	46	36	0.565	26	27	55	0.332
12	45	37	0.556	27	25	57	0.308
13	45	37	0.549	28	24	58	0.289
14	44	38	0.53	29	20	62	0.247
15	43	39	0.527	30	17	65	0.209

Average record for each seed (2005–2018)

There can also be good players found at the slots below 10

The first 10 picks have much more promise than those in the last 20 but some of the most valuable draft picks of all time have come from the later picks

- #11-Reggie Miller
- #12-Mookie Blaylock
- ***#13-Kobe Bryant and Karl Malone***
- #14-Clyde Drexler
- ***#15-Steve Nash***
- ***#16-John Stockton***
- ***#17-Shawn Kemp***
- #18-David West
- #19-Rod Strickland
- #20-Larry Nance
- #21-Rajon Rondo
- #22-Reggie Lewis
- ***#23-AC Green***
- ***#24-Arvydas Sabonis***
- #25-Nicolas Batum
- #26-Vlade Divac
- #27-Rudy Gobert
- ***#28-Tony Parker***
- #29-Josh Howard
- #30-Jimmy Butler

Is Tanking Worth It?

- Tanking for the number one overall pick is worth it
  - Opportunity to acquire game-transforming players like Magic Johnson, Shaquille O'neal and Lebron James
- Tanking for picks 2-5
  - 4.26 win shares a year, enough, on average, to pull the fifth worst team, up .04 win percentage points alone
- Tanking for picks 6-9
  - 3 win shares a year, enough, on average, to almost put the ninth worst team in playoff contention
- Otherwise, it is not worth it to miss out on the playoffs

QUESTIONS?