

Atlanta Hawks DS Assessment - Angus Lam

A. Which NBA team(s) has drafted the most players who...

- went to Duke and were drafted in or before the 2000 draft? **17**
- have a first name that begins with D and were drafted in an even year draft (1990, 1992, 1994, ...)? **110**

B. Describe the relationship between a team's first round pick slot in one year with their first-round pick slot in the subsequent year.

As expected, there is a spiked nature to the draft slots for each team, where a high draft pick in one year leads to a drop in draft position the subsequent year, and vice versa. In most cases, the deltas in draft positions are increasingly larger as you approach the extremes (1st and 30th picks). If we look at the average

Part 2: Analyze draft position value and team success/deficiencies compared to expectation.

After look through the data, many of the values provided in the dataset are dependent on playing time, which widely varies across teams and coaches. Because of this, I decided to stick with VORP, a statistic that has been widely used by others in the industry, and also takes into account playing time and their average performance statistics. To get a better understanding of what I was working with, I plotted the VORPs of all players on a scatter plot to visualize the distribution. I then decided that a quadratic equation (linear regression with 2 polynomial features) could be a good fit for the data. Since the range of the data was quite large, I decided to take the mean VORP across each draft slot (Figure 1), and train the model on the averages instead (Figure 2).

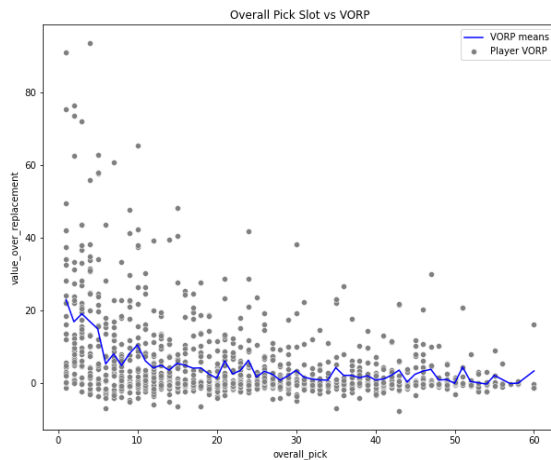


Figure 1: Overall Pick Slot vs VORP, without Prediction Line

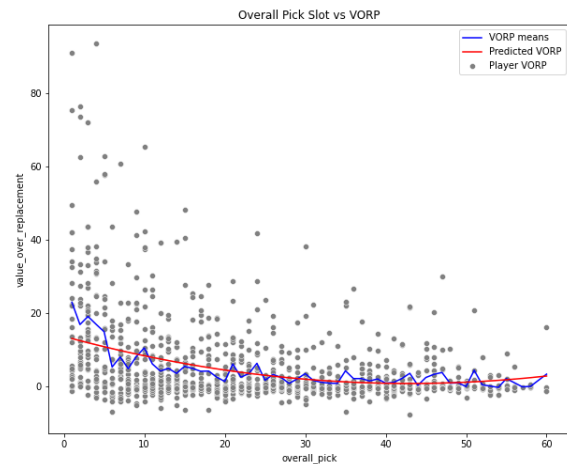


Figure 2: Overall Pick Slot vs VORP, with Prediction Line

When conditioning my model on NBA teams, I set an arbitrary bound of 2.5 on VORP deltas; that is, a team overperformed when their player's VORP is > 2.5 points compared to his projected VORP, and vice versa for underperforming players. Players with VORPs within the 2.5 bounds are "standard" performers. To compare the best and worst NBA teams at drafting, I ordered teams by the % of draft picks that were stars (Figure 3) or flops (Figure 4).

For active NBA teams, Figures 3 and 4 show that the Pelicans, Hawks, Bulls, and Clippers are among some of the active teams with the largest proportion of underperforming draft picks, while the Raptors, Heat, Thunder, and Warriors have the largest proportions of overperforming draft picks. Teams make many trades throughout every season which shift draft assets, so proportions make more sense.

	pred_VORP	over	under	count	over%	under%
team						
NOK	14.975339	0	2	2	0.000000	1.000000
NOP	45.088318	0	5	8	0.000000	0.625000
CHO	41.159339	0	5	8	0.000000	0.625000
ATL	231.602210	4	27	46	0.086957	0.586957
CHI	247.784901	11	27	50	0.220000	0.540000
LAC	208.619871	5	17	32	0.156250	0.531250
MEM	127.596499	7	12	23	0.304348	0.521739
MIA	148.264053	9	14	27	0.333333	0.518519
NYK	125.930540	4	14	28	0.142857	0.500000
WSB	64.072049	2	5	10	0.200000	0.500000

3: Underperforming NBA Teams

	pred_VORP	over	under	count	VORP_diff	over%	under%
college							
Syracuse	113.208687	4	11	18	33.508687	0.222222	0.611111
Florida State	93.417771	3	10	17	32.917771	0.176471	0.588235
Oklahoma State	61.478421	1	7	12	54.478421	0.083333	0.583333
Stanford	78.000927	3	9	16	35.900927	0.187500	0.562500
Gonzaga	69.594193	3	6	11	43.394193	0.272727	0.545455
UNLV	89.668567	3	6	11	-5.231433	0.272727	0.545455
Kansas	185.481725	5	17	32	53.781725	0.156250	0.531250
Duke	366.335207	12	26	49	68.835207	0.244898	0.530612
Louisville	98.000513	3	9	17	60.400513	0.176471	0.529412
LSU	90.470673	3	9	18	-9.529327	0.166667	0.500000

5: Underperforming College Teams

	pred_VORP	over	under	count	over%	under%
team						
NOH	60.293346	5	3	10	0.500000	0.300000
SEA	119.015945	11	8	25	0.440000	0.320000
TOR	156.914992	9	8	24	0.375000	0.333333
MIA	148.264053	9	14	27	0.333333	0.518519
OKC	55.628452	4	3	12	0.333333	0.250000
NJN	163.784847	8	10	25	0.320000	0.400000
GSW	210.421776	11	15	35	0.314286	0.428571
MEM	127.596499	7	12	23	0.304348	0.521739
BRK	26.847306	3	3	10	0.300000	0.300000
CLE	236.034571	12	18	40	0.300000	0.450000

Figure 4: Overperforming NBA Teams

	pred_VORP	over	under	count	VORP_diff	over%	under%
college							
Wake Forest	64.783835	6	1	10	-176.816165	0.600000	0.100000
Florida	90.050711	8	6	15	-58.949289	0.533333	0.400000
Georgetown	98.381666	5	4	13	-47.718334	0.384615	0.307692
Georgia Tech	127.358119	7	8	19	-23.941881	0.368421	0.421053
UConn	145.530075	8	8	22	-82.269925	0.363636	0.363636
Arkansas	46.562362	4	3	11	-13.837638	0.363636	0.272727
Marquette	28.454790	4	1	11	-86.445210	0.363636	0.090909
Alabama	59.435759	4	5	12	-28.664241	0.333333	0.416667
UCLA	140.238275	9	10	31	-103.861725	0.290323	0.322581
Michigan State	99.618134	6	8	21	-9.181866	0.285714	0.380952

Figure 6: Overperforming College Teams

For college teams, if we look at draft success in terms of total players, we see many many of the powerhouse and blue blood schools in both successful and unsuccessful draft picks. Since these schools attract the most attention and talent, these numbers really reflect just the sheer amount of draft prospects they produce each season. However, if we look at proportions of players in each category for schools that have sent at least 10 players to the NBA, we see a different list of schools. Many of the schools that underperformed are not known as powerhouse schools. However, the same can also be said for the list of overperforming schools, with schools like Wake Forest, Marquette, and Arkansas among the top schools.

If I could expand on this research, I would look into coaches and GM performance instead of teams. Team ideologies change as coaches and GMs change, so it may be interesting to compare player success to coaching staff as opposed to just a team. It may also be interesting to see how each team's supporting cast may help the development of a draft pick (i.e. veterans, star players), and how teams could use that information to use or sell their pick.

