



Visualizing Rookie Year Performance Correlations on Career Performance

Devon Sinha--12/9/21

Introduction & Motivation

High Focus on the NBA Draft: A bunch of resources are put into evaluating talent at the college level. Some websites even have mock drafts for players 3-4 years away from being drafted. Look to extend this analysis to actual NBA players

Rookie Contract Decisions/Extensions: Rookie contracts expire quickly (within 4 years) and rookie extensions are very costly. Teams should want to predict how good rookies may be in year 5-beyond.

Jordan Poole Case Study:

- Yr 1: 8.8/2.1/2.4 on 33.3/27.9/79 splits and 7.25 PER
- Yr 3: 18.0/3.2/3.4 on 44/35.1/91 splits and 15.07 PER



Data description

Datasets: From the years 1950-2017: player information, season statistics

- Mainly using a cleaned version which matches player rookie year statistics to year 5 statistics, along with one the matches player rookie year statistics with year 5-8 statistics
- 1790 rows, and 45 columns in final dataset (

	Player	position_x	Age_x	G_x	MP_x	PER_x	TS%_x	OWS_x	DWS_x	WS_x	...	2P%_y	eFG%_y	FT%_y	TRB_y	AST_y	STL_y	BLK_y	TOV_y
1786	Sam Young	F	24.0	80.0	1321.0	13.0	0.518	0.6	0.7	1.2	...	0.486	0.489	0.767	187.0	71.0	68.0	23.0	61.0
1787	Thaddeus Young	F	19.0	74.0	1554.0	16.5	0.570	2.6	2.0	4.5	...	0.526	0.524	0.735	377.0	86.0	100.0	23.0	118.0
1788	Cody Zeller	C-F	21.0	82.0	1416.0	13.1	0.498	0.4	2.2	2.6	...	0.460	0.462	0.774	362.0	100.0	34.0	49.0	62.0
1789	Tyler Zeller	F-C	23.0	77.0	2033.0	11.0	0.486	0.8	1.2	2.0	...	0.540	0.538	0.719	282.0	36.0	18.0	38.0	60.0
1790	Wang Zhizhi	C	23.0	5.0	38.0	14.9	0.513	0.1	0.0	0.1	...	0.462	0.536	0.737	111.0	22.0	11.0	18.0	25.0

5 rows x 45 columns

<https://www.kaggle.com/drgilermo/nba-players-stats/code>

Approach

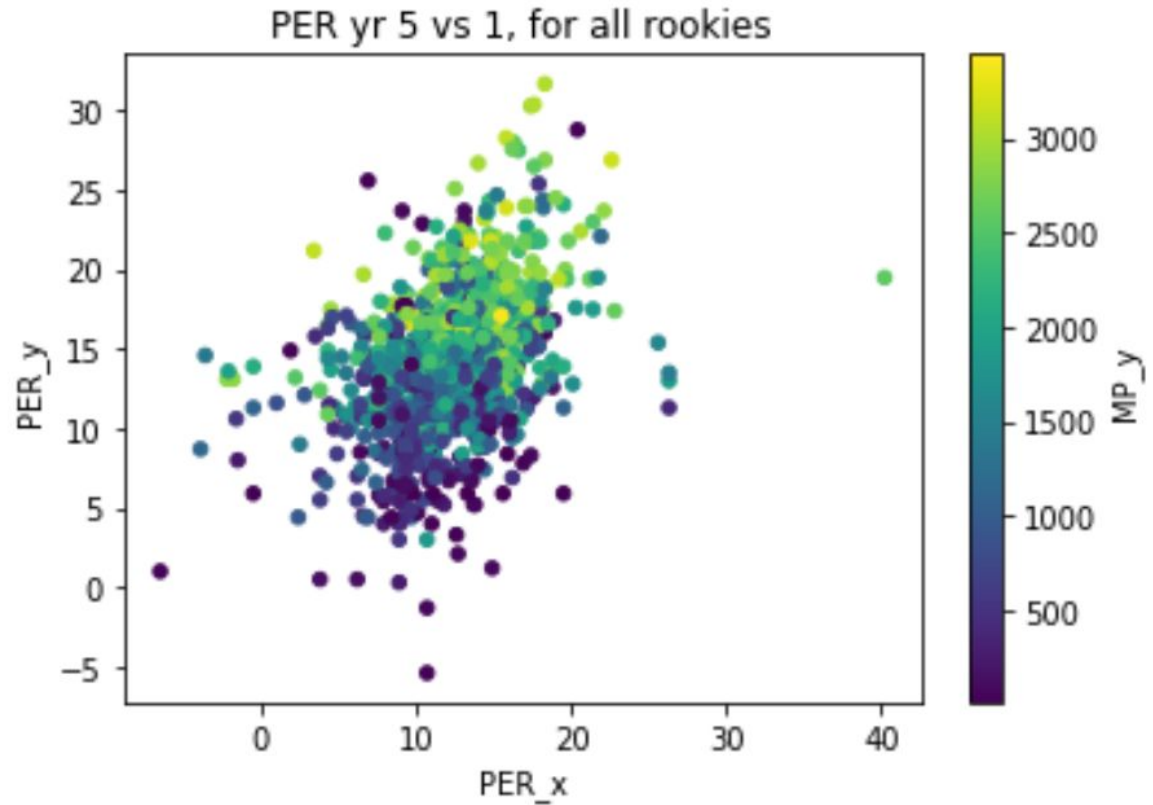
Initially:

- Multivariate Regression--predict ppg/apg/rpg for players based on data
 - Quickly did this, found age was a somewhat significant negative predictor
 - Potential fantasy point projection, but not too accurate
- Logistic Regression-- predict things such as will this player become an all star, or will they still be in the league

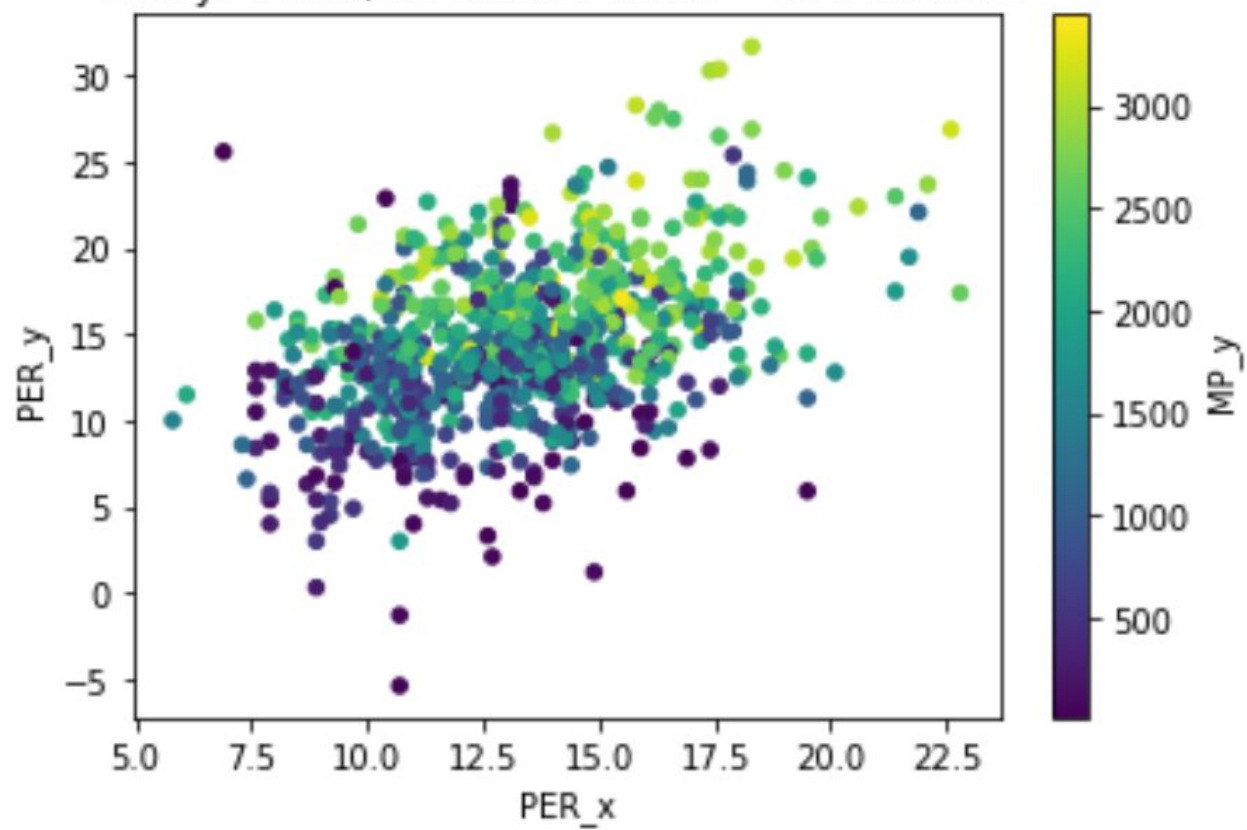
Decided:

- Want to be able to view overall “trends” and clusters of where similar performing rookie players are after year 5, and vice-versa
- Focus on exploratory data analysis on the variables provided

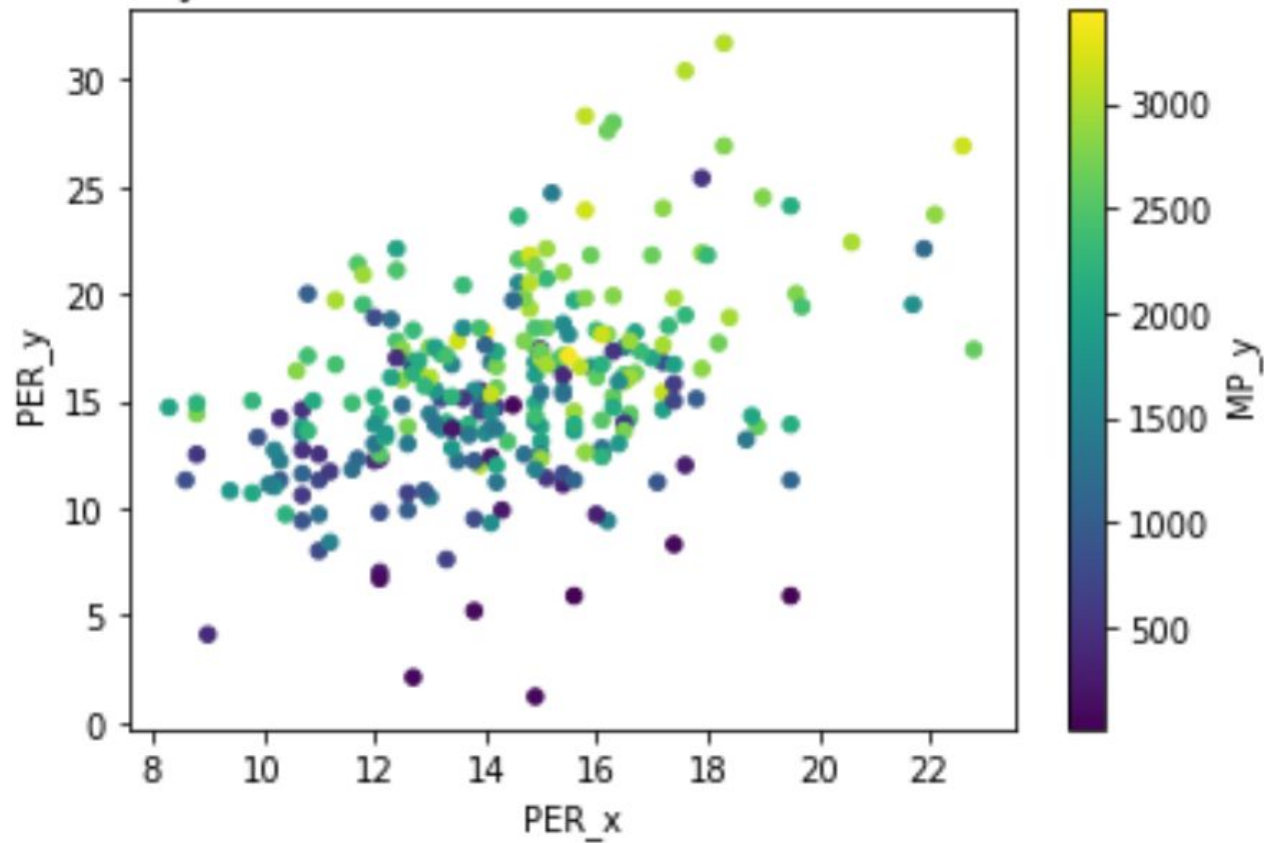
Exploratory Data Analysis

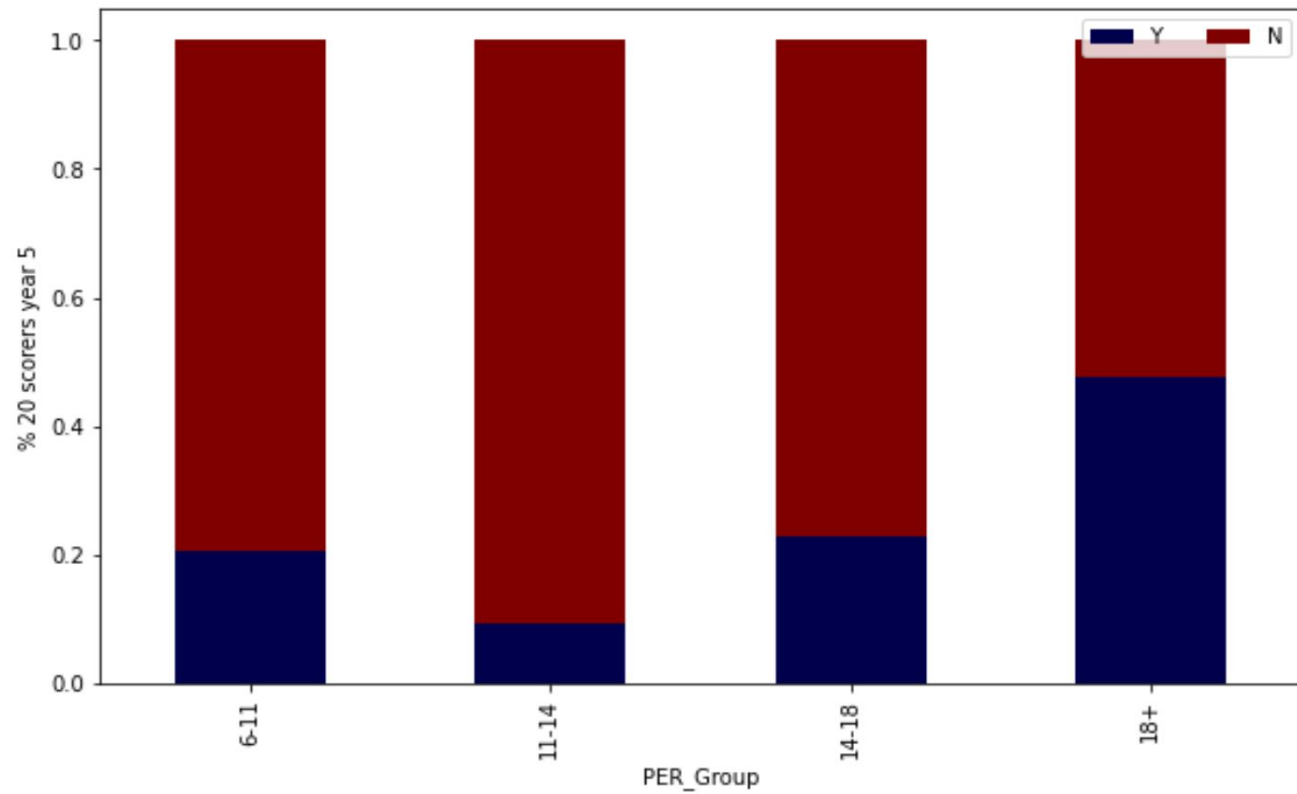


PER yr 5 vs 1, for rookies with ≥ 500 minutes



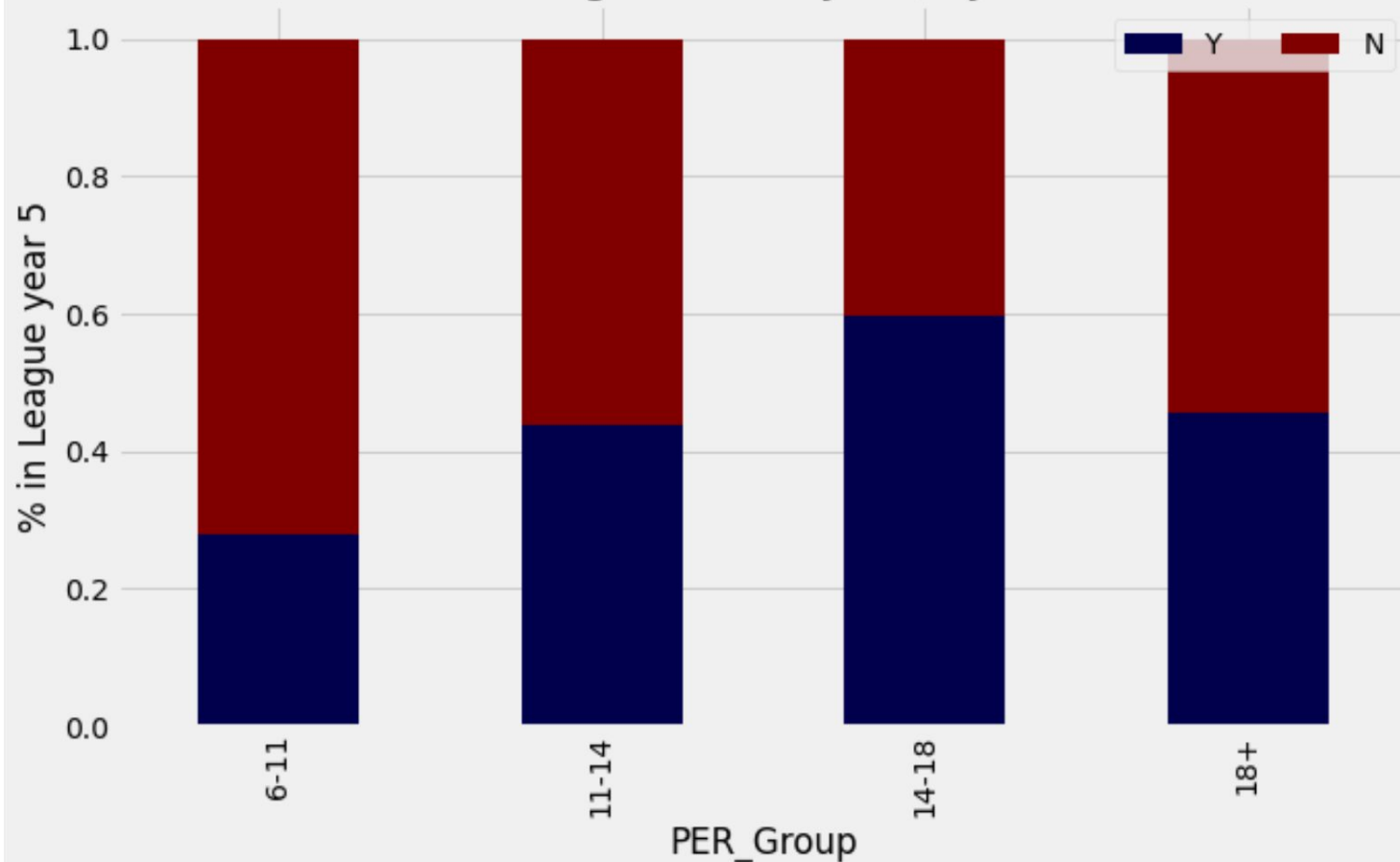
PER yr 5 vs 1, for rookies with ≥ 1750 minutes



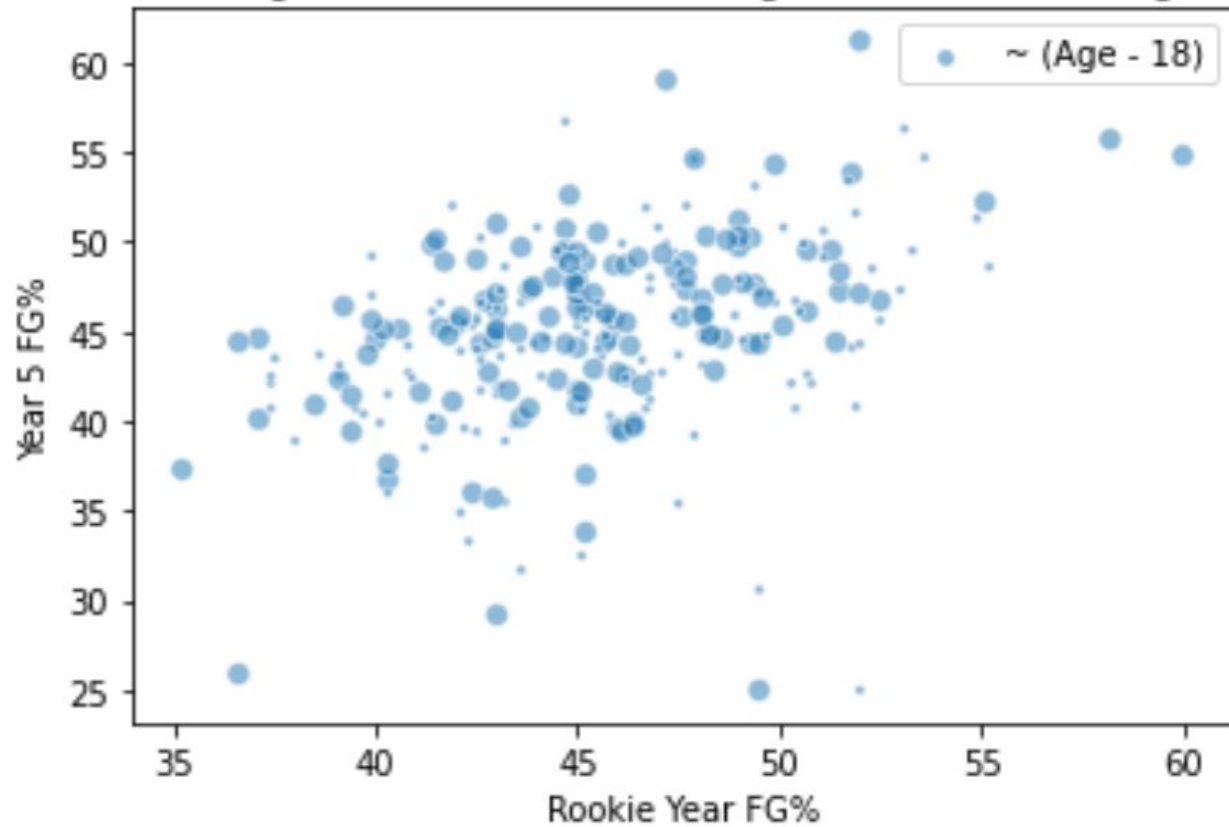


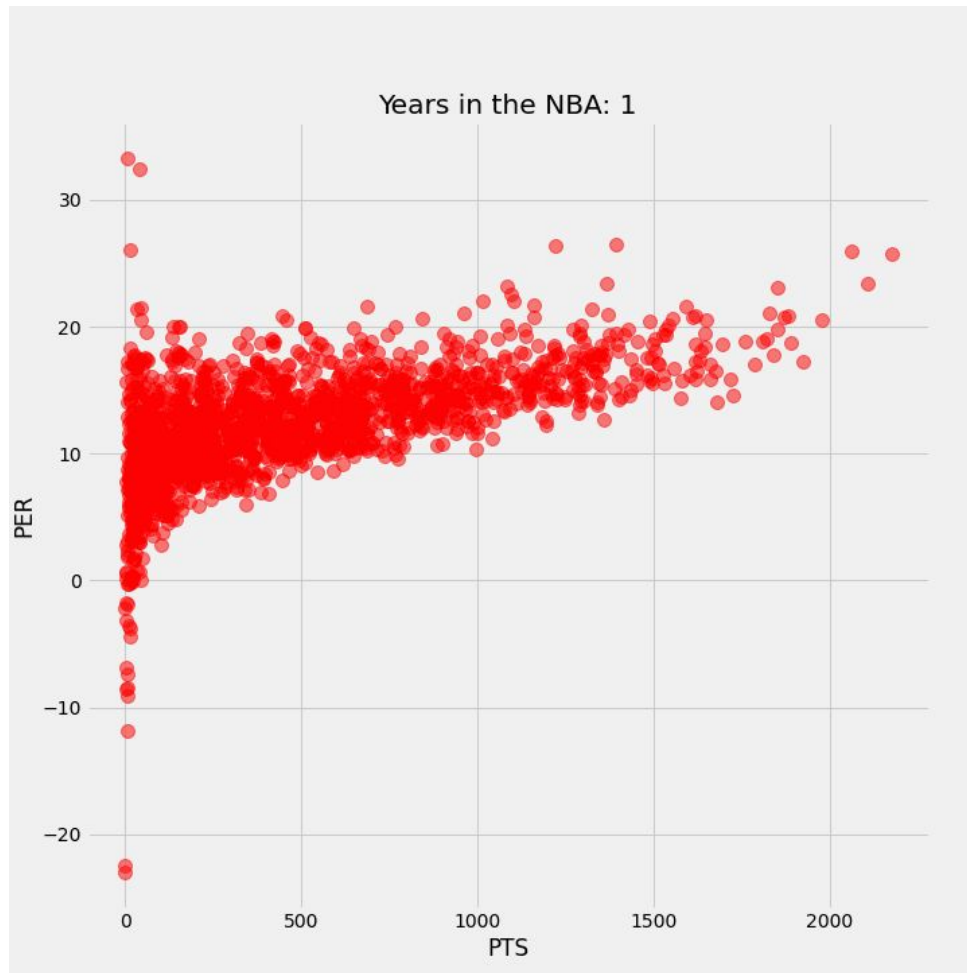
RK	PLAYER	GP	MPG	TS%	AST	TO	USG	ORR	DRR	REBR	PER
51	Bobby Portis, MIL	66	20.8	.598	9.4	7.4	22.6	7.3	21.6	14.7	20.00
52	Jaylen Brown, BOS	58	34.5	.586	12.4	10.0	34.9	3.4	12.8	8.0	19.95
53	Julius Randle, NY	71	37.6	.567	19.6	11.1	33.7	3.2	23.2	13.2	19.73
54	Derrick Favors, UTAH	68	15.3	.663	12.3	10.1	16.2	12.2	18.5	15.5	19.69
55	Willy Hernangomez, NO	47	18.0	.591	12.7	8.7	19.6	13.3	23.4	18.4	19.65
56	Russell Westbrook, WSH	65	36.4	.509	30.6	12.5	38.7	4.0	22.7	13.3	19.52
57	Andre Drummond, CLE/LAL	46	27.0	.519	10.7	14.1	36.2	14.8	31.6	24.9	19.46
58	Mo Bamba, ORL	46	15.8	.556	8.7	9.0	24.9	9.7	22.8	16.0	19.39
59	Devin Booker, PHX	67	33.9	.587	14.8	10.6	37.7	1.0	10.0	5.7	19.33
60	Hassan Whiteside, SAC	36	15.2	.566	6.3	12.5	27.1	10.5	27.4	18.8	19.28
RK	PLAYER	GP	MPG	TS%	AST	TO	USG	ORR	DRR	REBR	PER
61	Mike Conley, UTAH	51	29.4	.589	27.6	8.9	28.2	2.3	7.5	5.0	19.26
62	Brandon Ingram, NO	61	34.3	.584	17.5	9.1	33.1	1.6	11.7	6.7	19.24
63	Gorgui Dieng, MEM/SA	38	14.6	.670	17.6	11.7	23.0	7.6	16.6	13.5	19.20
64	Jaxson Hayes, NO	60	16.1	.675	8.6	9.6	16.8	8.1	15.6	11.9	19.14
65	Ivica Zubac, LAC	72	22.3	.693	14.1	12.7	17.3	12.2	19.4	15.9	19.10
66	Moses Brown, OKC	43	21.4	.572	2.7	11.4	19.2	14.0	22.6	18.3	18.83
67	Mason Plumlee, DET	56	26.8	.638	26.5	13.8	20.0	8.7	22.9	15.7	18.70
68	Derrick Rose, DET/NY	50	25.6	.550	21.9	8.2	36.2	1.7	7.0	5.6	18.38
	Ben Simmons, PHI	58	32.4	.584	31.2	13.5	26.4	5.0	16.9	11.1	18.38
70	Jamal Murray, DEN	48	35.5	.592	19.3	9.0	29.6	2.1	9.0	5.6	18.33
RK	PLAYER	GP	MPG	TS%	AST	TO	USG	ORR	DRR	REBR	PER
71	Khris Middleton, MIL	68	33.4	.588	21.4	10.3	30.1	2.1	13.2	7.9	18.30
72	Naz Reid, MIN	70	19.2	.599	9.1	8.7	25.3	5.1	16.9	10.8	18.27
73	Cody Zeller, CHA	48	20.9	.599	16.8	9.9	21.1	11.1	19.7	15.4	18.22
74	Serge Ibaka, LAC	41	23.3	.585	14.6	8.7	23.0	7.2	19.7	13.6	18.21
75	Collin Sexton, CLE	60	35.3	.573	15.4	9.8	33.8	2.0	5.8	3.9	18.06

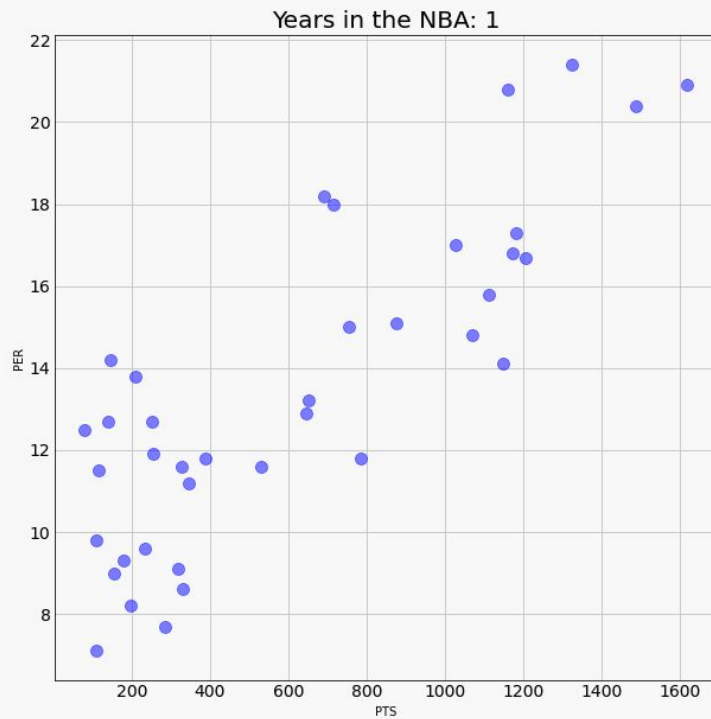
Percent in league for 5+ year, by rookie PER



Change in Field Goal Percentages, Given Rookie Age







Greatest Risers and Fallers

Greatest Increase in PER

	Player	PER_x	PER_y	pDiff	Age_x
728	Kevin Pritchard	6.9	25.6	18.7	23.0
457	LeBron James	18.3	31.7	13.4	19.0
602	Tracy McGrady	17.4	30.3	12.9	18.0
928	Dwyane Wade	17.6	30.4	12.8	22.0
377	James Harden	14.0	26.7	12.7	20.0
245	Kevin Durant	15.8	28.3	12.5	19.0
21	Richard Anderson	10.4	22.9	12.5	22.0
195	Stephen Curry	16.3	28.0	11.7	21.0
234	Goran Dragic	9.8	21.4	11.6	22.0
862	Amar'e Stoudemire	16.2	27.6	11.4	20.0

Greatest Decrease in PER

	Player	PER_x	PER_y	pDiff	Age_x
39	D.J. Augustin	14.9	1.2	-13.7	21.0
807	Charles Smith	19.5	5.9	-13.6	24.0
902	Andrew Toney	12.7	2.1	-10.6	23.0
801	Charles Smith	15.6	5.9	-9.7	23.0
761	Nate Robinson	12.6	3.3	-9.3	21.0
895	Marcus Thornton	17.4	8.3	-9.1	22.0
736	Khalid Reeves	16.9	7.8	-9.1	22.0
367	Eddie Griffin	13.8	5.2	-8.6	19.0
771	Quinton Ross	8.9	0.3	-8.6	23.0