On Draft: The efficiency landscape in the NBA by draft round

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Background

Over the past 2 decades, NBA teams' game strategies have evolved to be more efficient[1]

Dataset: player performance metrics, demographic information, height, weight

   Timeframe: 1996-97 through 2022-23

Goal: to investigate how the relationship between draft round (Round 1 vs Round 2*) and true shooting percentage (TS%) changes over time across 20 NBA seasons

	1st Round	2nd Round	Undrafted	Overall
	(N=6416)	(N=2210)	(N=1335)	(N=9961)
True Shooting Percentage				
	0.53 (0.05)	0.53 (0.06)	0.52 (0.06)	0.53 (0.06)
Height (inches)				
	201.41 (9.00)	200.19 (8.57)	197.11 (9.50)	200.56 (9.09)
Weight (lbs)				
	101.25 (12.38)	100.37 (12.18)	96.38 (11.85)	100.40 (12.37)
Age				
	27.04 (4.54)	27.12 (3.95)	27.87 (3.54)	27.17 (4.30)
Games Played (%)				
	0.80 (0.18)	0.75 (0.19)	0.71 (0.20)	0.77 (0.19)

Table 1: Summary Statistics for NBA Dataset

$$TS\% = \frac{PTS}{2(FGA + (0.44 \times FTA))}$$
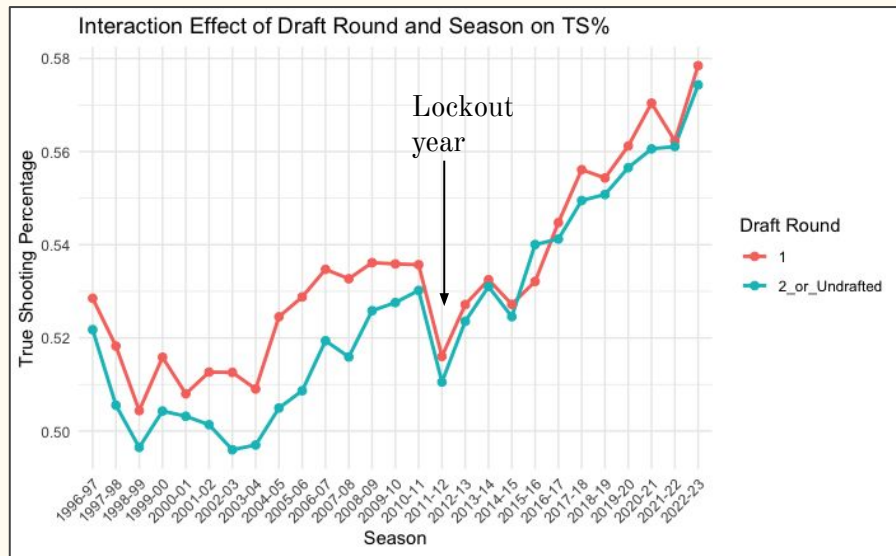
Figure 1: TS% formula
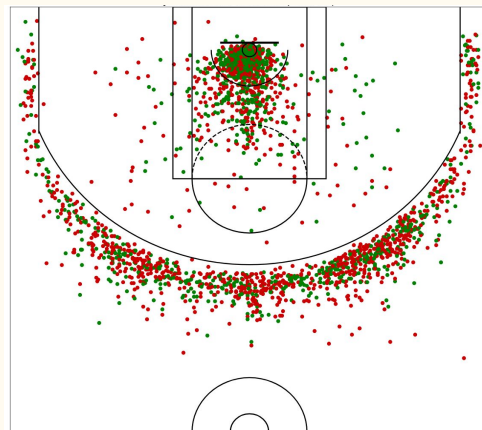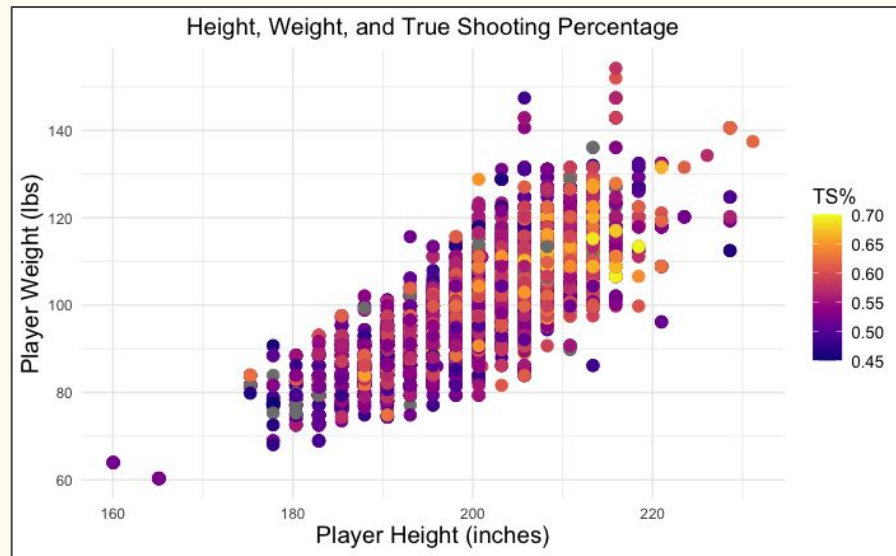

Figure 2: modern shotchart

How does the average shooting efficiency vary over time across NBA players drafted in different rounds?

Specifically, does the discrepancy between rounds change over the course of the dataset?

Preliminary Analysis

Figure 3: *Spaghetti plot showing the interaction effect of time on the relationship between draft round and TS%*

Figure 4: *Representation of the relationship between height, weight, and true shooting percentage*

Model

$$TS\% \sim \beta_0 + \beta_1(Season*Draft\ Round) + \beta_2 Height + \beta_3 Weight + \beta_4 Age + u_{Name} + \varepsilon$$
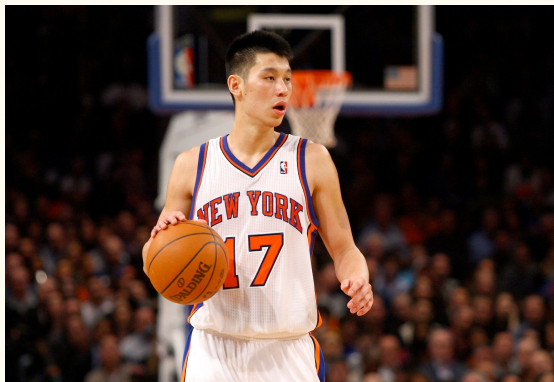
Mixed Effects Model

- Outcome variable: true shooting percentage (TS%)

- Fixed effects: draft round, season, height, weight, age

- Random effects: player name to account for individual differences between players

Results

Coefficient	Estimate	Std. Error	df	t value	p value
Intercept	-3.622E+00	2.421E-01	2.343E+03	-14.96	< 2e-16 ***
Season	1.996E-03	1.202E-04	2.321E+03	16.601	< 2e-16 ***
Draft Round	-3.003E-01	3.837E-01	3.722E+03	-0.783	0.433844
Height	5.664E-04	1.640E-04	2.482E+03	3.454	0.000562 ***
Weight	3.629E-04	1.143E-04	3.287E+03	3.174	0.001517 **
Age	-2.649E-04	1.375E-04	4.472E+03	-1.927	0.054049
Season:Draft Round	1.479E-04	1.909E-04	3.723E+03	0.775	0.438446

Conclusion/Discussion

- TS% significantly influenced by season, height, and weight
  - Improvement over time
- Overall interaction between draft round and season is insignificant
  - Improvements in TS% over time are consistent across all players, regardless of draft round
- Next steps: "big man" sub-analysis, pre- vs post-lockout

Shooting

Size

Thank you!