Generating Relative Draft Value in the NBA Draft and Predicting Success from College Basketball

A Major Qualifying Project Report:

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by

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# 5.1 Analyze existing basketball player performance metrics

# WS VORP PER WS FP

# 5.2 Feature engineer new player performance metrics addressing shortcomings with existing metrics

# CIA BP AP

# 5.3 Calculate the approximate value of every pick in the NBA Draft

# First, we summed up the total value of each metric of each draft pick.

# This graph is oversensitive to extremely good players who come up at particular positions, which makes the graph jagged. In order to provide a more accurate curve, we cluster the draft picks into groups. These groups are 1-3, 4-7, 8-14, 15-30, 31-45, and 46-60. We felt these clusters fall in line with how picks are generally compared to one another.

# This graph provides a much clearer picture of the values of each metric. Also featured in this graph is the NBA Rookie Salary scale. As there is no mandatory salary for second round picks, we use the league minimum salary. We also display the number of players calculated in each cluster, for context.

# Using trendlines, we were able to construct mathematical equations for each metric’s value.

5.3.1 Create a Jimmy Johnson-style NBA Draft pick value chart

We created draft value charts for each pick. NFL Analyst Rich Hill used Jimmy Johnson’s chart as a baseline to evaluate draft-pick only trades to create a new draft value chart. With this in mind, we found an assortment of draft-pick only trades in the NBA to evaluate each of the draft charts and select a ‘best’ chart.

|  |  |
| --- | --- |
| Metric | Mean Abs Error |
| VORP | 0.045443858 |
| WS | 0.070661068 |
| FP | 0.081395181 |
| RS | 0.096852287 |
| AVG | 0.112119185 |
| PER | 0.149346209 |
| BP | 0.167310009 |
| AP | 0.198652996 |

Clearly, VORP is the most accurate chart.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **DraftPos** | VORP | **DraftPos** | VORP | **DraftPos** | VORP | **DraftPos** | VORP |
| **1** | 3000 | **16** | 1082 | **31** | 390 | **46** | 141 |
| **2** | 2803 | **17** | 1011 | **32** | 364 | **47** | 131 |
| **3** | 2619 | **18** | 944 | **33** | 340 | **48** | 123 |
| **4** | 2446 | **19** | 882 | **34** | 318 | **49** | 115 |
| **5** | 2286 | **20** | 824 | **35** | 297 | **50** | 107 |
| **6** | 2135 | **21** | 770 | **36** | 278 | **51** | 100 |
| **7** | 1995 | **22** | 719 | **37** | 259 | **52** | 94 |
| **8** | 1864 | **23** | 672 | **38** | 242 | **53** | 87 |
| **9** | 1741 | **24** | 628 | **39** | 226 | **54** | 82 |
| **10** | 1627 | **25** | 587 | **40** | 212 | **55** | 76 |
| **11** | 1520 | **26** | 548 | **41** | 198 | **56** | 71 |
| **12** | 1420 | **27** | 512 | **42** | 185 | **57** | 67 |
| **13** | 1327 | **28** | 478 | **43** | 172 | **58** | 62 |
| **14** | 1239 | **29** | 447 | **44** | 161 | **59** | 58 |
| **15** | 1158 | **30** | 418 | **45** | 151 | **60** | 54 |

Compared to the NFL, the NBA follows a different level of apparent talent drop-off.

For the first 20 picks, NBA talent is relatively better than the same draft pick in the NFL. However, after that, the NBA talent continues to decline quickly while the NFL flatlines.

5.4 Find the highest value picks based on various measure of cost

First, we use the obvious measure of cost, salary, to divide the pick values by.

Next, we use Jimmy Johnson’s values of value for NFL picks.