

# The NBA Draft: Expectations Versus Reality

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## Introduction

The National Basketball Association's (NBA) annual reverse-order draft is structured such that worse teams generally select players before better teams, with the expectation that earlier draft picks are stronger performers. This expectation can be compared to ex post NBA performance to assess the efficiency of the draft. However, if better players are forced to join relatively low-quality teams, it follows that (1) these better players will have significant playing time, but (2) their productivity will be negatively impacted by their teammates' quality. This "double curse" means that any performance measure that does not account for teammate quality will be biased. In addition, we note that the NBA's minutes played variable is recorded in whole minutes on a game-by-game basis, meaning that rounding errors compound when looking at season-level data.

We develop a performance measure using factor analysis fed with six residual performance variables controlling for team quality and playing time. We recover two performance measures we call "hands & feet," where "feet" captures observable performance-related characteristics, such as height; and the orthogonal "hands" measure captures the idea of "fast-hands"/"game sense." We show that the "hands" measure indicates high productivity, but is difficult to assess compared to the "feet" measure, which is strongly correlated with draft number. This implies that risk averse teams prefer players that exhibit "feet" performance. However, the "hands" measure appears to primarily drive above-average NBA performance.

## Literature

Research focusing on the determinants of NBA draft position are plentiful. E.g., Kahn & Sherer (1988) find no statistically significant relationship between college performance and draft position. However, Coates & Oguntimein (2010) and Berri, Brook & Fenn (2011) find that college points scored are a significant determinant of draft position, but that college points scored are only weakly correlated with NBA scoring.

Looking at performance measures and the NBA draft, Barzilai (n.d) assesses the value of draft picks from 1980–2007 and finds the draft is efficient (i.e., ex post performance is highly correlated with draft number) using four-year Player Efficiency Rating and win share measures. Similarly, Motomura (2016) finds a analogous pattern using four-year box score efficiency and wins produced measures.

## Current measures

Current performance measures are built using various formulations of direct performance measures (e.g., points scored). These metrics can be classified in two broad categories: (1) box scores measures; and (2) Plus-Minus based measures. With respect to box scores, most assign ad hoc variable weights to create a relative value for each statistic, such as the performance value of points scored versus assists. The main drawback of the Plus-Minus-statistic is that it does not control for the quality of a player's teammates and opponents. The Adjusted-Plus-Minus targets this deficiency, although identifying a good exogenous approximation of player quality is problematic.

Thus, for assessing the NBA draft, most performance measures are not appropriate due to the previously identified "double curse." In particular, the methods employed to control for teammate quality require an exogenous measure of player quality. Similarly, the vast majority of measures that adjust for playing time use the minutes played variable, which is rounded at the game-level until 2006. Thus, the rounding error compounds with each game and increases variance. Minimum playing time cut-offs are typically used to address this issue, which decreases the sample size and excludes players with limited playing time.

## New performance measure

Using the NBA's online database ([www.stats.nba.com](http://www.stats.nba.com)), we compile all player-level data for the 1996/97–2015/16 seasons, with approximately 9,000 observations where each observation is defined by a player and season.

Next, the performance residuals are calculated for the six player statistics: points, assists, steals, blocks, offensive and defensive rebounds. These performance residuals are derived from a Mincer-style wage regression, where the residual term for each player-season observation is the unexplained portion of each original player statistic.

The six performance residuals are then collapsed into two performance measures using factor analysis. Factor analysis finds these two performance measures, FA(1) and FA(2), through a process where the information within the original inputs is maintained within fewer factors. We then assess the FA(1) and FA(2) measures over the three-year period immediately after a player is drafted, which limits our sample to players drafted between 1996/97 and 2013/14.

## **Results**

We term the FA(1) factor “feet” in that it captures the obvious and cleanly measured performance related characteristics, such as height. The “feet” measure is highly correlated with the draft pick position. The FA(2) measure is term “hands” based on the idea of “hand speed” and “game sense” that has previously been difficult to identify.

## **References**

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