To Sign or Not to Sign: Quantifying the Financial Opportunity Costs of Major League Draftees

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Introduction
Despite unfavorable odds of advancing through the minor league system (Witnauer, Rogers, & Onge, 2007) and average pay of just $7,500 a season (Berg, 2017), approximately 1,200 baseball players sign entry-level contracts to play professional baseball each year. The purpose of this study was to quantify the financial opportunity costs of signing a professional baseball contract so players, agents, and administrators can better understand the financial risks and rewards of baseball employment.

Literature Review
Players who sign contracts should weigh the financial benefits of professional baseball against what they are giving up in earning potential at other jobs. To weigh the opportunity costs of signing, players need information about their chances of advancing through the minors. Witnauer, Rodgers, and Onge (2007) found position players took an average of 5.6 seasons to reach the MLB and that they had an 11% chance of exiting at each level. Chandler and Stevens (2012) used random forest models and found “at bats” was the best predictor of promotion. Using an opportunity cost framework, Winfree and Molitor (2007) found high school players drafted at higher rounds should sign contracts, whereas lower round picks should attend college and sign later. We add to this research by using analytical models to estimate opportunity costs for drafted fielders and pitchers.

Method
Player variables and performance statistics from over 8,000 players drafted and signed between 2003 and 2011 were used to develop a series of C5.0 classification models that predicted (with an average out-of-sample accuracy of over 60%) the simultaneous probabilities of a player appearing in half-season ball, A or A+, AA, AAA, MLB, or being out of the league, in each of his first six seasons. These probabilities were then multiplied by the expected earnings at each level to produce estimates of how much money a player would earn during his first six seasons in professional baseball.

By varying players’ draft positions, whether they attended college or not, and key performance statistics (e.g., OBP and WHIP), we calculated the thresholds at which the estimated earnings of fielders and pitchers fell below the average earnings of 18-24 year old males working in the standard labor force.

Findings
Fielders drafted after the 89-90th picks will generally earn more if they pursue a career outside of baseball (although some players can make up the difference with signing bonuses). Pitchers with college degrees drafted after the 33rd will earn more if they pursue a career outside baseball. Players with higher performance can expect to earn more than non-baseball workers over a longer range of draft picks. Players drafted out of high school have different opportunity costs, and pitchers and fielders face substantially different financial decisions.

Players can use these models to estimate how much they need in signing bonuses or off-season work to replace income losses. For example, college graduates need around $122,000 to recoup losses whereas high school graduates need around $69,000 to recoup losses. We also use the opportunity cost models to discuss various cognitive, identity-based, and organizational implications.