McKinsey&Company

Ed Miller and
Daniel Singer

For daily fantasy-sports operators, the curse of too much skill

McKinsey Digital September 2015

Fantasy-sports leagues are red hot. But ensuring recreational players stay involved presents a fundamental operating challenge.

Daily fantasy sports (DFS) is red hot. In 2014, 1.5 million Americans paid more than $1 billion in tournament entry fees, and FanDuel grew 300 percent in active customers. Yahoo announced on July 8 that it will join the fray. Kohlberg Kravis Roberts & Company, Comcast/NBCUniversal, and others have invested in FanDuel, whose valuation now exceeds $1 billion. DraftKings' exclusive advertising deal with Disney reportedly guarantees $250 million in advertising on ESPN. With sponsorships in every US major league, DFS advertising will soon exceed the levels of online-poker sites PokerStars and Full Tilt during the pre-2011 poker boom.

But investors are overlooking a fundamental operating challenge: the risk that the skill element of daily fantasy is so high that DFS pros will wipe out recreational players in short order. For a real-money contest to achieve sustained popularity, it needs the right balance of skill versus luck. Chess is popular, but almost no one plays it for money, because it's far too skill based; the better player wins almost every time. Poker thrives because an amateur can beat the best players in the world. Indeed, on June 13, 2015, at the World Series of Poker, a 51-year-old football coach from Jupiter, Florida, defeated seven pros in the final table of a $5,000 tournament to win $567,000. Another tournament in May set a record for the largest live poker tournament ever, with 22,374 entrants—pros and weekend warriors alike.

DFS affords a huge advantage to skilled players. In the first half of the 2015 Major League Baseball (MLB) season, 91 percent of DFS player profits were won by just 1.3 percent of players (exhibit). Here is the breakdown:

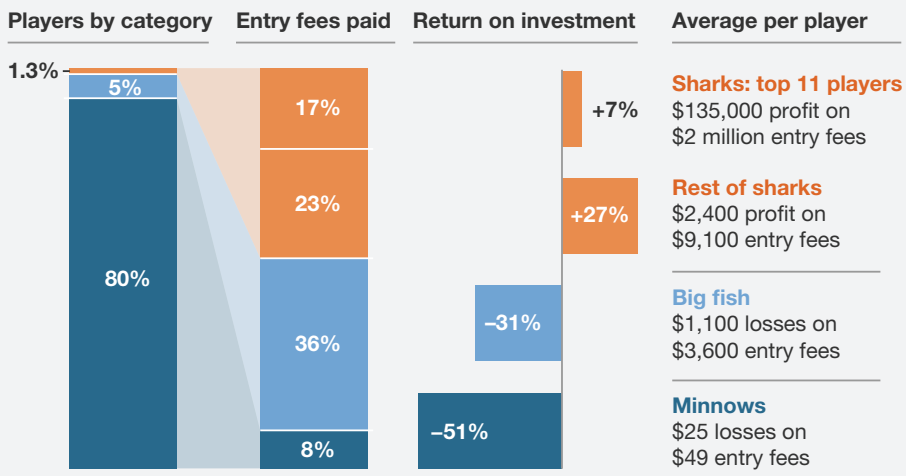
- The top 11 players paid, on average, $2 million in entry fees and profited $135,000 each. They accounted for 17 percent of all entry fees. The winningest player in our sample profited $400,000 on $3 million in entry fees.

- The rest of the top 1.3 percent of players paid, on average, $9,100 in entry fees and profited $2,400 each, for a 27 percent return on investment, which is extremely impressive. These contestants accounted for 23 percent of all entry fees and 77 percent of all profits.
- Five percent of players are the big fish; they lost $1,100 on entry fees of $3,600 on average.
- Eighty percent of players were the minnows; they lost $25 on entry fees of $49 on average.

Exhibit

In one sample, 1.3 percent of daily-fantasy-sports players paid 40 percent of entry fees and scored the largest profits.

First half of US Major League Baseball season,[1] 2015



[1]13.7% of total players are not shown, representing 16% of total entry fees.

McKinsey&Company | Source: Estimates from publicly available data

Hence, the DFS economy depends heavily on retaining the big fish. They had a staggering loss rate of 31 percent of what they paid in entry fees and accounted for 75 percent of all losses. Each minnow loses less than $10 per month and may happily continue to play forever, but each big fish loses more than $4,000 per year. The entire DFS economy depends on these few players.

How DFS operates today

Three factors have driven the way DFS has developed. The first relates to *strategy*. While the object of DFS seems obvious—to pick the players who will hit home runs or score touchdowns in a given day of games—in large tournaments with headline-grabbing prizes, payouts are skewed heavily to the top 1 percent of participants. Therefore, the goal is to *create a lineup that will produce extreme outcomes* (good and bad) more often than the average lineup.

For example, a casual player might pick Los Angeles Angels center fielder Mike Trout, Boston Red Sox left fielder Hanley Ramirez, and Arizona Diamondbacks first baseman Paul Goldschmidt in an MLB contest because they are star sluggers. A sharp player might instead choose Curtis Granderson, Wilmer Flores, and Lucas Duda, all of whom play for the New York Mets, because choosing players from the same team creates covariance, the Mets are at Wrigley Field in Chicago, the Chicago Cubs have a right-handed fly-ball pitcher on the mound, the wind will be gusting out to right field, and the Mets are a road favorite.

The second factor relates to *inefficient pricing*. Sports betting has thrived despite a large skill gap between the average sports fan and the sharp bettor. The reason is that the lines are set by a large, liquid market. You can walk up to a betting window in Las Vegas, select a team at random, and still win almost 50 percent of the time. Betting randomly, you will lose money over time, but your average loss will be only slightly more than the 4.5 percent vigorish.

When you create a DFS lineup, you get a fixed salary cap and buy players at prices set by the site. Trout might cost you $5,500 out of your $50,000 cap, while Granderson might cost just $3,500. But these prices don't reflect player values perfectly. For example, on some sites, they do not take into account the opposing starting pitcher or game-day lineup changes. Finding underpriced players among 800 active MLB options can be overwhelming to the novice, but sharks use sophisticated models to optimize their lineups.

Finally, DFS offers *no protection for novices*. In poker, there is a large skill gap between the best players and the typical recreational players. But fortunately for the recreational players, the best players won't be found at their tables. The sharks focus their energies on the tables with $5,000 buy-ins and higher. You can sit at a $50 buy-in table and be safely insulated from the best of the best, because it's not worth their time to try to take your money.

In DFS, the top players can enter every contest. One player, who goes by the handle maxdalury on DraftKings, every day enters nearly every MLB contest on the site, from the $10,600 buy-in contests to the $1 buy-in tournaments. Indeed, sharp players often enter each small buy-in tournament dozens or even hundreds of times. The novice player is like Neo in *The Matrix Reloaded*, fighting hundreds of Agent Smiths simultaneously.

Potential fixes

There are ways to mitigate these problems and give the game a better shot to thrive long term. Salary-cap pricing could be made more accurate using algorithms that exist today. Third-party fantasy-sports analytics sites such as Rotoviz.com and Razzball.com publish game-by-game player projections that price players more accurately than the salaries used by the DFS site operators.

Sites could float proposed salaries on an overnight market where, in a game within a game, sports fans could "buy" or "sell" players at their market salaries using play money. These trades would then succeed or fail based on the players' performances in the next day's games. The reward for successful traders might be, along with bragging rights, the ability to convert play money into free tournament entries or site merchandise. The reward for the sites would be salaries priced more efficiently by the wisdom of the crowd.

Limits (for example, no more than two players from the same MLB team) could be placed on lineup construction to make optimal strategies more intuitive. Sharp players could be restricted from playing with more casual players. For example, FanDuel has limited the number of entries per day to prevent players from entering every single contest. More radical changes to the game, including dropping the salary-cap model entirely or offering bracket-style tournaments (like the US National Collegiate Athletic Association basketball tournament) are also possible.

FanDuel chief executive officer Nigel Eccles points out that, "Sports fans are passionate; they participate in fantasy leagues because DFS makes watching sports more exciting." The rapid growth of DFS confirms his view. But at some point, will the bottom 5 percent of DFS players stop saying (like a 1950s Brooklyn Dodgers fan) "Wait til next year"? ☐

This article originally appeared in *Sports Business Journal*, July 2015.

Ed Miller is an MIT-trained engineer and has written numerous best-selling poker-strategy books, including *The Course: Serious Hold 'Em Strategy For Smart Players* (Monkey Tilt Books, April 2015). **Daniel Singer** is a senior adviser to McKinsey and the leader of sports and gaming in the High Tech, Media, and Telecom Practice; he is based in McKinsey's New York office.