Constructing “Sports Efficiency” metric

Goal: To predict a winner during comparisons of efficiency

Layout:

1. Traditional metrics overview
   1. Correlation between traditional metric and result or winning percentage (e.g. yards per game, PER, plus/minus)
2. How traditional metric mislead the result prediction, drawbacks
   1. PER. One of the chief drawbacks of PER is that it doesn’t capture much on the defensive end
   2. Plus / minus is heavily biased towards players that play with good teammates
   3. Offensive is beyond shooting percentage, points, shots made
3. Identify new metrics for sports efficiency
   1. Football: Efficiency
      1. How many yards to gain for per single point (total yards offense / total points)
      2. How many yards a defense forces offense to gain a single point
      3. One metric: Yards per point differential
   2. Football: Player Efficiency Rating (PER)
      1. Goal: Introduce one metric for all positions to measure all players in NFL
   3. Basketball:
      1. Adjusted plus-minus (adjust plus-minus for the quality of teammates to get an unbiased result), the goal is to determine what percentage of the credit should be given to one player versus the other when they played together. One approach is to differentiate each player’s contribution by tracking the performance when one of the players is on the court and the other doesn’t
      2. EOP (efficient offensive production). Beyond shooting percentage.
         1. OE (offensive efficiency). OE = (FG+A) / (FGA – ORB + A + TO)
         2. EPS (efficient points scored). EPS = F\*OE\*Points
            1. F = League points / sum(OE\*points)
         3. EOP
4. Examples in football and basketball
5. How these metrics can improve the prediction of winning
   1. Ranking of players / teams based on their record
   2. Correlation between winning and those new metrics

Link:

* Identifying a new metric for football efficiency: <http://www.sloansportsconference.com/content/identifying-a-new-metric-for-football-efficiency/>
* NFL Player Efficiency Rating Metric: <http://www.sloansportsconference.com/content/elitics-model-nfl-player-efficiency-rating-per-metric/>
* Understanding advanced basketball analytics: <http://inspirationalbasketball.com/understanding-advanced-basketball-analytics/>
* Breaking down the NBA’s PER Metric: <http://www.basketballinsiders.com/breaking-down-the-nbas-per-metric/>
* Book: Basketball Analytics: by Stephen M. Shea and Christopher E. Baker

Game Day Analytics Meeting Notes: 1/30/2017 8:30PM

Start with Metric Efficiency and then movie to Simulation

Put together a shell of what we want talk about for presentation

Running logistic regression, error terms, in Excel, data tables

Head to head simulation

Team-level metrics

Probasketball.com

Kenpom.com

Kaggle.com

Idea:

Data source: Historical team-level basketball data, pre-March Madness

Outcome:

1. whether they can make final four