

# Improving risk management for moneyline betting on UFC fights

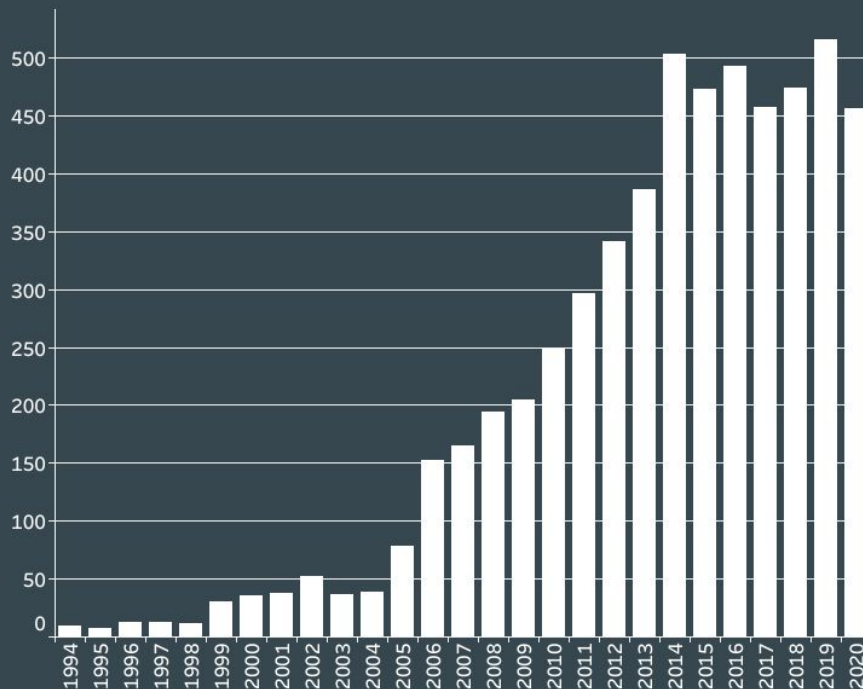
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# Ultimate Fighting Championship (“UFC”)

- Explosive growth in popularity in recent years
- Growing revenue share for DraftKings

# of UFC bouts, historical



# Bookmaking for sports betting is about risk management

Moneyline for Ronda Rousey vs. Holly Holm

|                                |                               |  |
|--------------------------------|-------------------------------|--|
| Ronda Rousey (favorite)        | -750 (probability to win 88%) | ..... if won, \$750 bet pays out \$100 (excl. principle) |
| ● Holly Holm (underdog)        | +525 (probability to win 16%) | ..... if won, \$100 bet pays out \$525                   |
| Over-round (“expected profit”) | 4% of all bets made           | ..... 88% + 16% - 100%                                   |

Simplified example of cash flow among 3 bets:

|   |                       |         |                                 |           |
|---|-----------------------|---------|---------------------------------|-----------|
| 2 bets on Ronda Rousey + 1 bet on Holly Holm        | → DraftKings collects | \$1,600 | $2 * \$750 + 1 * \$100$         | = \$1,600 |
| Expected payout: \$1,600 - 2 bets for Ronda         | → Expected return is  | (\$100) | $\$1,600 - 2 * (\$750 + \$100)$ | = -\$100  |
| Actual result is upset: \$1,600 - 1 bet for Holly   | → Actual return is    | \$975   | $\$1,600 - (\$525 + \$100)$     | = \$975   |
| Due to the upset result, DraftKings exceeded target | → Target is           | \$64    | $\$1,600 * 4\%$                 | = \$64    |

# Surprise

About  $\frac{1}{3}$  of the time

\* based on processed dataset

| Fighter name                  | Total upsets* | Total fights* | % of upset         |
|-------------------------------|---------------|---------------|--------------------|
| Michael Johnson               | 15            | 19            | 79%                |
| Donald Cerrone                | 10            | 30            | 33%                |
| Tim Boetsch                   | 10            | 18            | 56%                |
| Carlos Condit                 | 10            | 14            | 71%                |
| Rafael Dos Anjos              | 9             | 25            | 36%                |
| Charles Oliveira              | 9             | 24            | 38%                |
| Jeremy Stephens               | 9             | 21            | 43%                |
| Diego Sanchez                 | 9             | 17            | 53%                |
| Mauricio Rua                  | 9             | 16            | 56%                |
| Jan Blachowicz                | 9             | 13            | 69%                |
| Ben Rothwell                  | 9             | 12            | 75%                |
| Ross Pearson                  | 8             | 22            | 36%                |
| Johnny Hendricks              | 8             | 19            | 42%                |
| Darren Elkins                 | 8             | 18            | 44%                |
| Neil Magny                    | 8             | 16            | 50%                |
| Thiago Alves                  | 8             | 12            | 67%                |
| Jim Miller                    | 7             | 27            | 26%                |
| Demian Maia                   | 7             | 24            | 29%                |
| Matt Brown                    | 7             | 20            | 35%                |
| Cub Swanson                   | 7             | 17            | 41%                |
| Dennis Bermudez               | 7             | 16            | 44%                |
| <i>Other (1,279 fighters)</i> | 1,978         | 5,878         |                    |
| <i>Sum total</i>              | 2,161         | 6,278         | <i>Average 34%</i> |

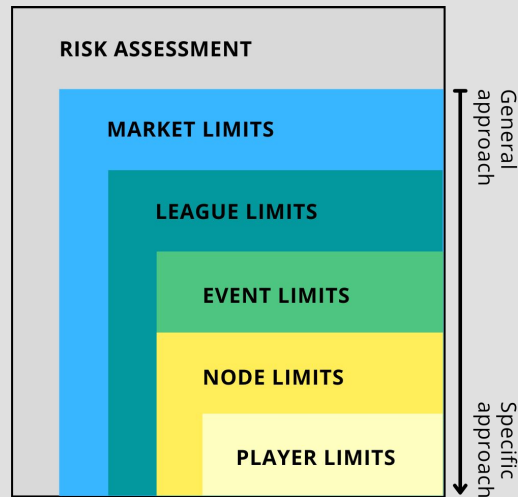
# Improving your risk & revenue metrics

## Build a predictive model

What is the likelihood of a fight to result in an upset?

## Measures of success

- Improved tracking error and lowered value-at-risk
- Accurate identification of upsets



# Key elements

Collect dataset of previous fight statistics & betting odds



Data analysis



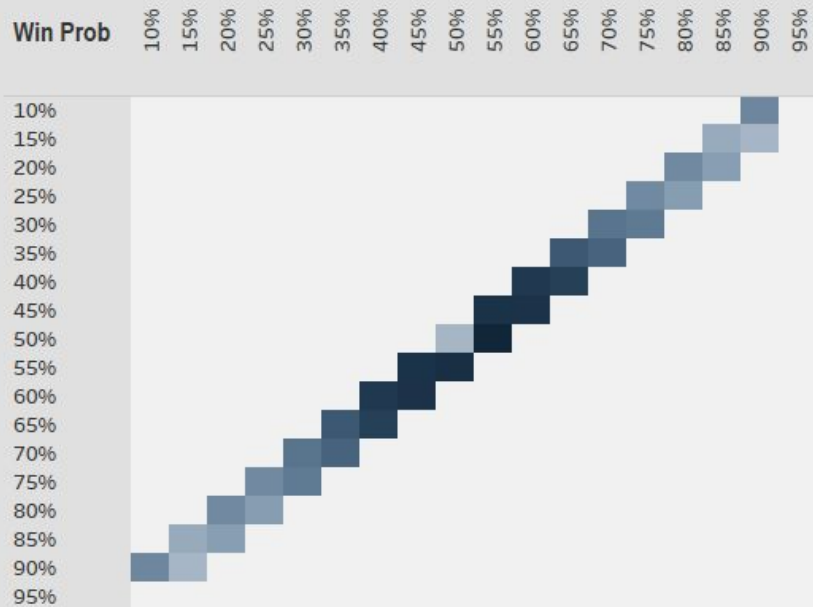
Predictive modeling to identify the upsets



Adjust odds in guidance with the predictive model outputs

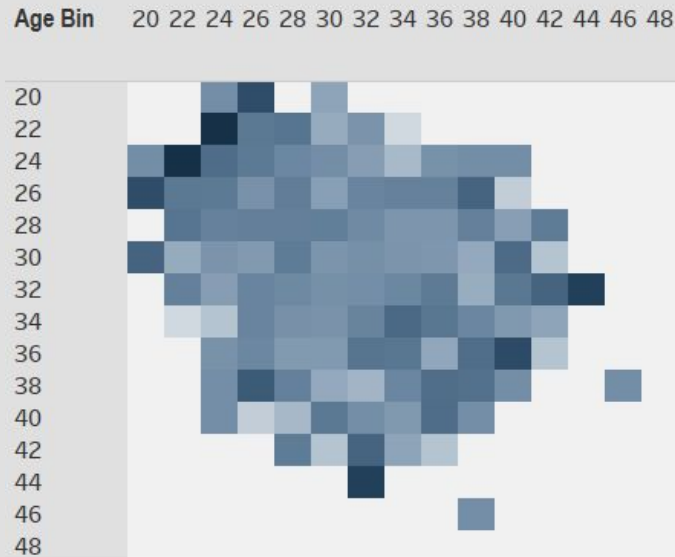
# Exploring the upsets

Upsets as % of all fights, by implied win probability\*



Upsets by win probability  
0.0000 0.5140

Upsets as a % of all fights, by fighter ages\*\*



Upset by ages  
0.0000 0.7500

\* derived from odds

\*\* filtered for fighter-pairs with more than 2 fights

# Potential

## Sentiment analysis

Analyze online sentiment and flow of money to understand the drivers for changes in the odds for the duration that they are offered in the market

## Competitor analysis

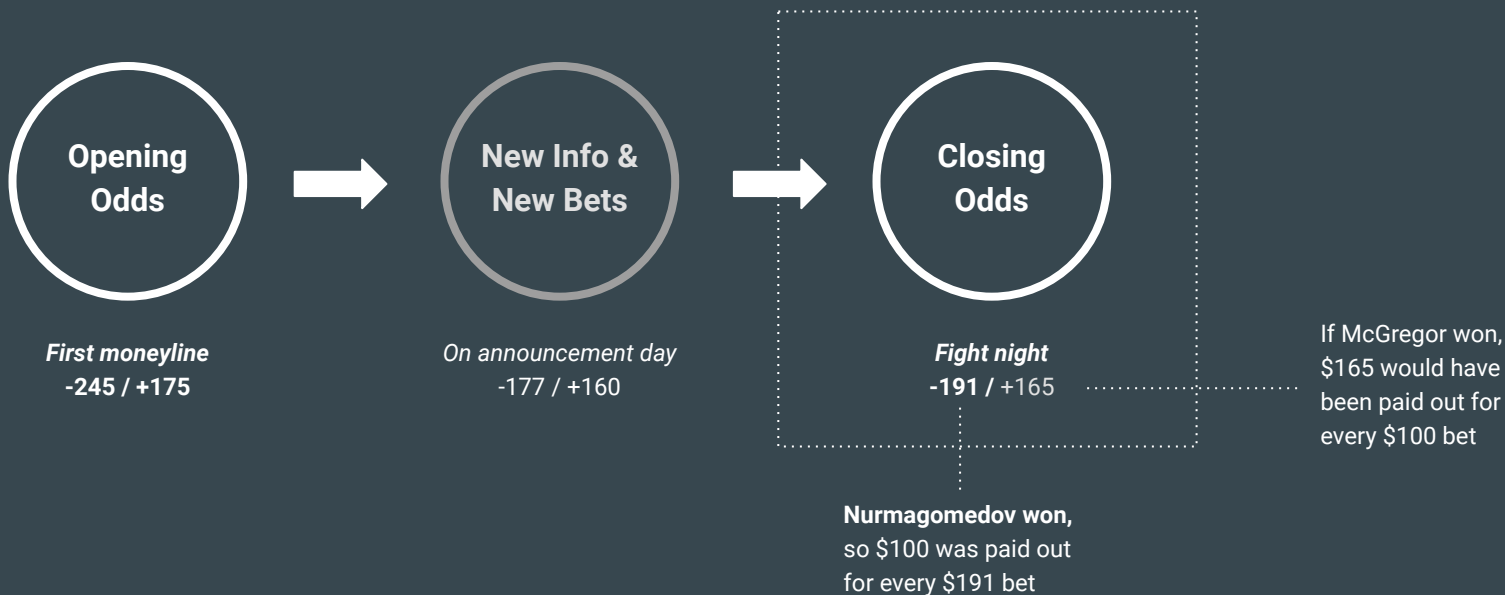
Using the historical odds listed by the competitors, build a model that maximizes revenue



Q&A

# Appendix - Moneyline Betting

Khabib Nurmagomedov (title defense) / Conor McGregor (underdog)



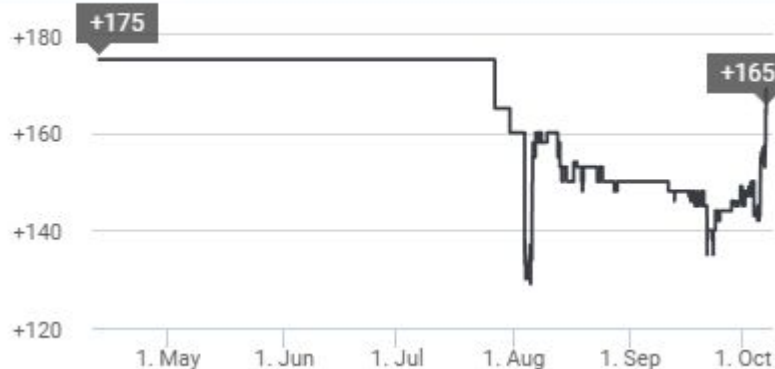
# Appendix - Moneyline Betting

Khabib Nurmagomedov / Conor McGregor

Khabib Nurmagomedov (vs. Conor McGregor) – Mean odds

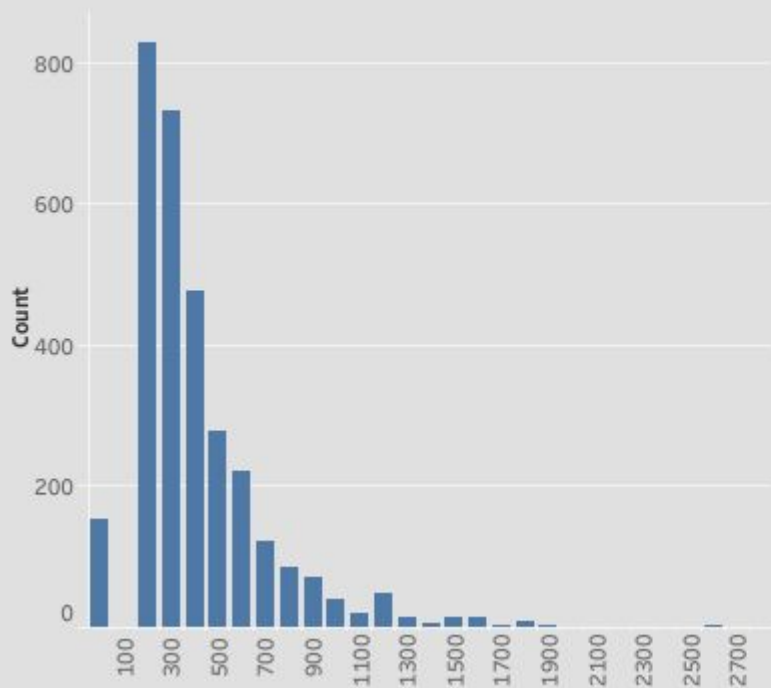


Conor McGregor (vs. Khabib Nurmagomedov) – Mean odds

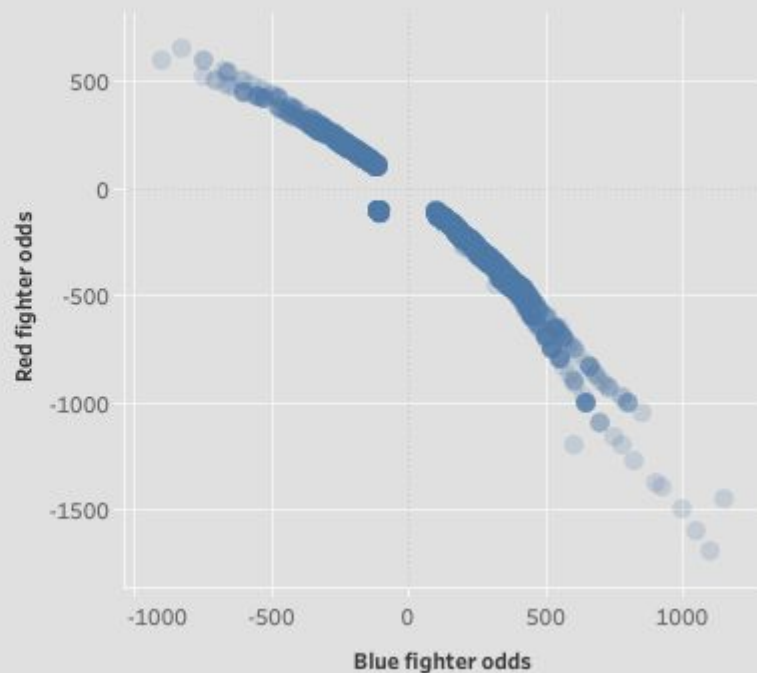


# Appendix - EDA

Distribution of all spreads

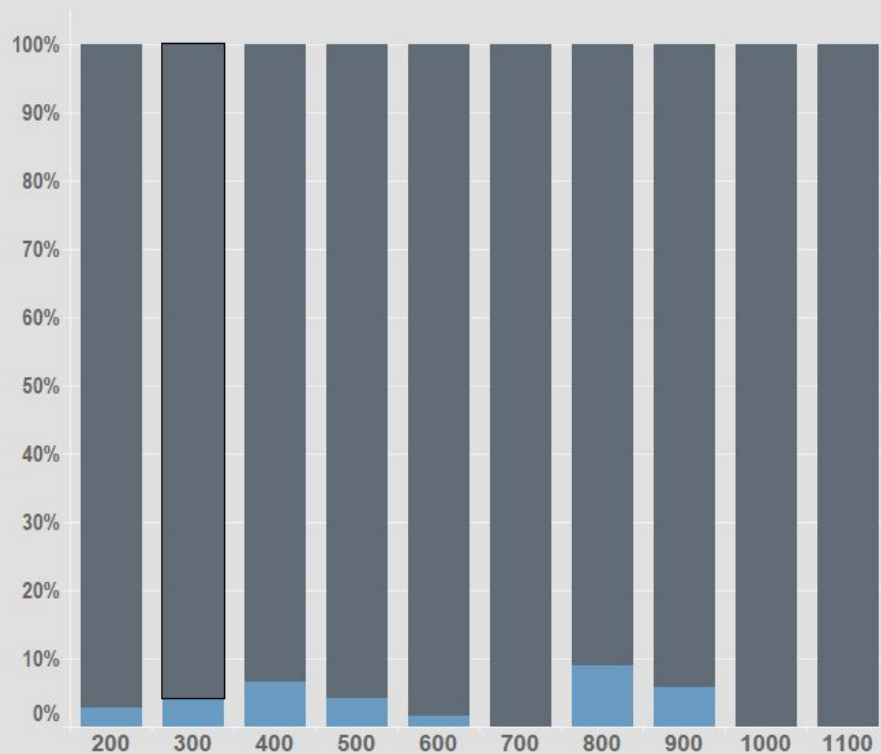


All pairings of odds



# Appendix - EDA

Number of upsets in %, by spread



Number of upsets in %, by fight type

