Improving risk management for moneyline betting on UFC fights
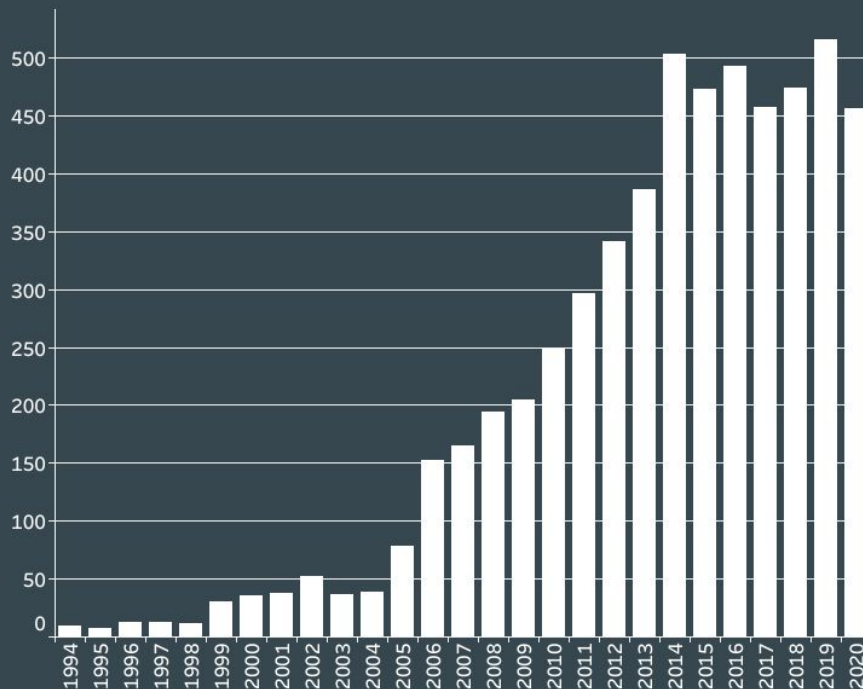
...

DRAFT KINGS

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 @ UFC 193, November 14, 2015

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 Holy		→ **Actual return** is	**$975**		$1,600 - ($525 + $100)	= $975	

Surprise

About ⅓ of the time

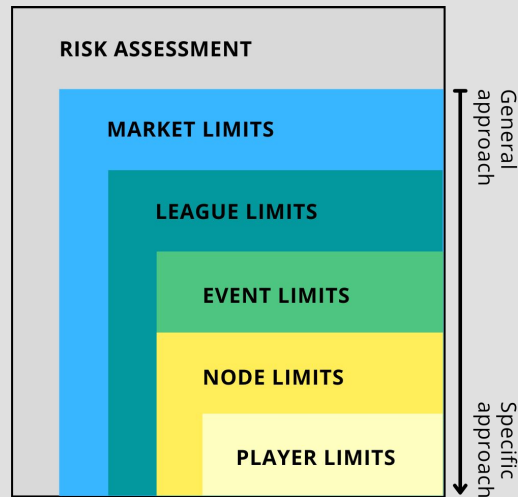| Fighter name	Total upsets*	Total fights*	% of upset
Michael Johnson	15	19	79%
Donald Cerrone	10	30	33%
Tim Boetsch	10	18	56%
Carlos Condit	10	14	71%
Rafael Dos Anjos	9	25	36%
Charles Oliveira	9	24	38%
Jeremy Stephens	9	21	43%
Diego Sanchez	9	17	53%
Mauricio Rua	9	16	56%
Jan Blachowicz	9	13	69%
Ben Rothwell	9	12	75%
Ross Pearson	8	22	36%
Johny 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%
Other (1,279 fighters)	1,978	5,878	
Sum total	2,161	6,278	*Average 34%*

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
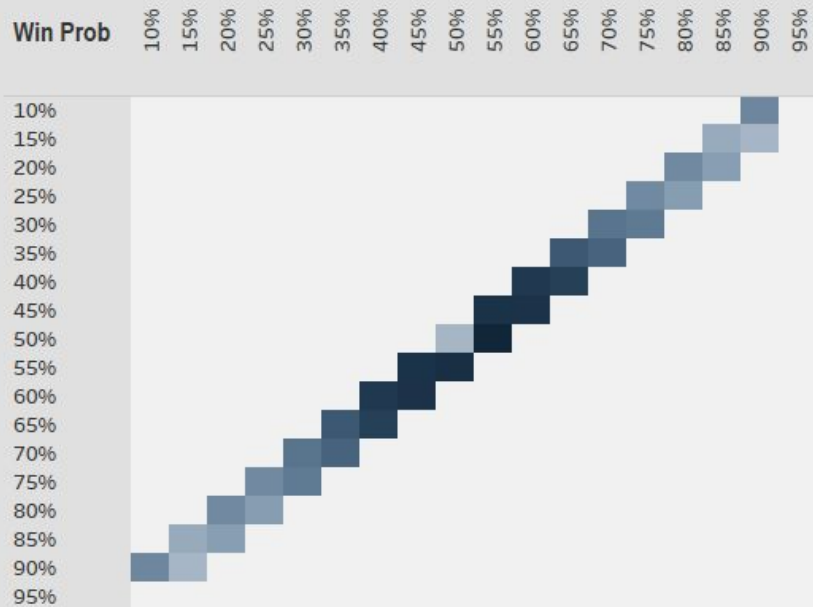
Data analysis

Predictive modeling to identify the upsets

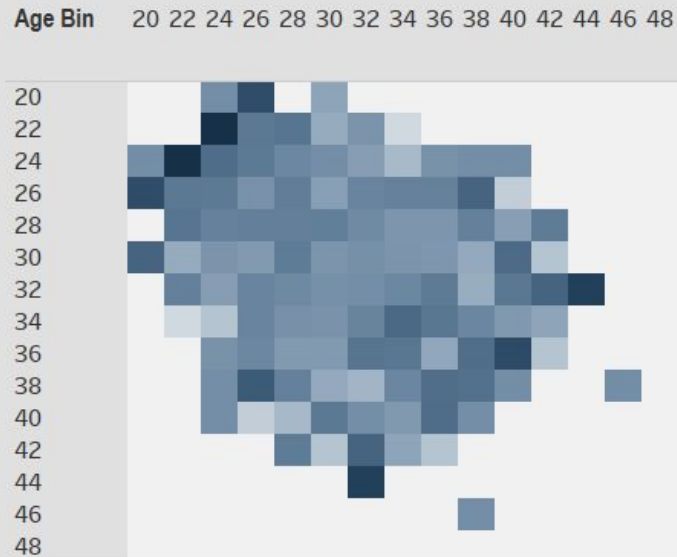Adjust odds in guidance with the predictive model outputs

Exploring the upsets

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

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

Upsets by win probability
0.0000 — 0.5140

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
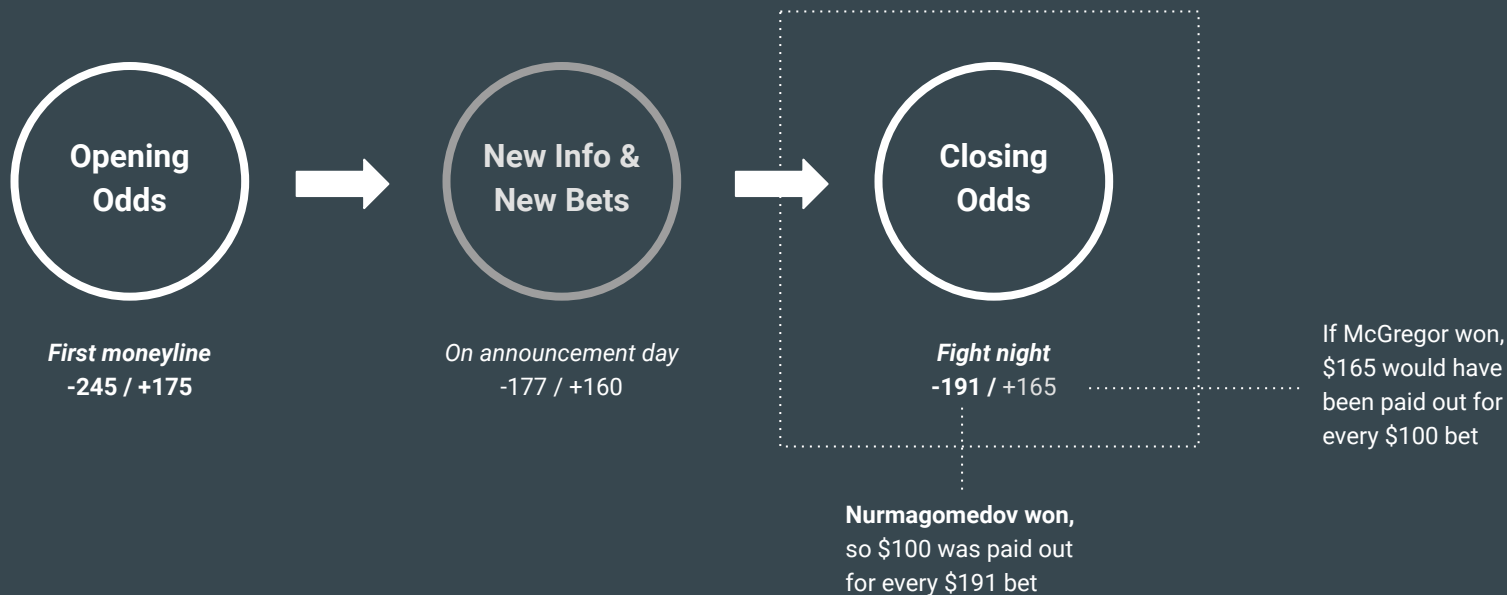
Competitor analysis

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

Q&A

Appendix - Moneyline Betting

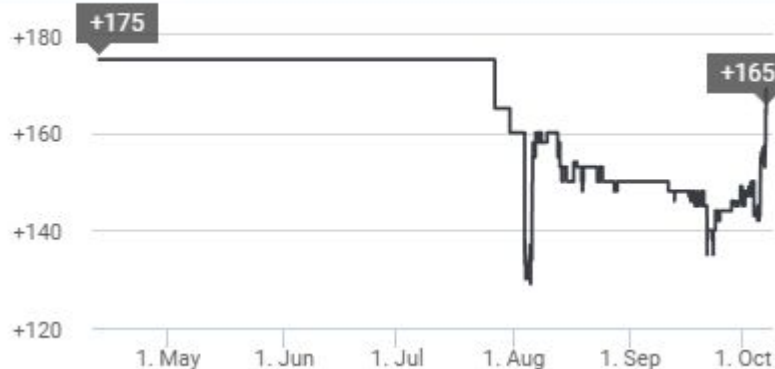Khabib Nurmagomedov (title defense) / Conor McGregor (underdog)

Opening Odds

First moneyline
-245 / +175

New Info & New Bets

On announcement day
-177 / +160

Closing Odds

Fight night
-191 / +165

Nurmagomedov won, so $100 was paid out for every $191 bet

If McGregor won, $165 would have been paid out for every $100 bet

Appendix - Moneyline Betting

Khabib Nurmagomedov / Conor McGregor

Khabib Nurmagomedov (vs. Conor McGregor) – Mean odds
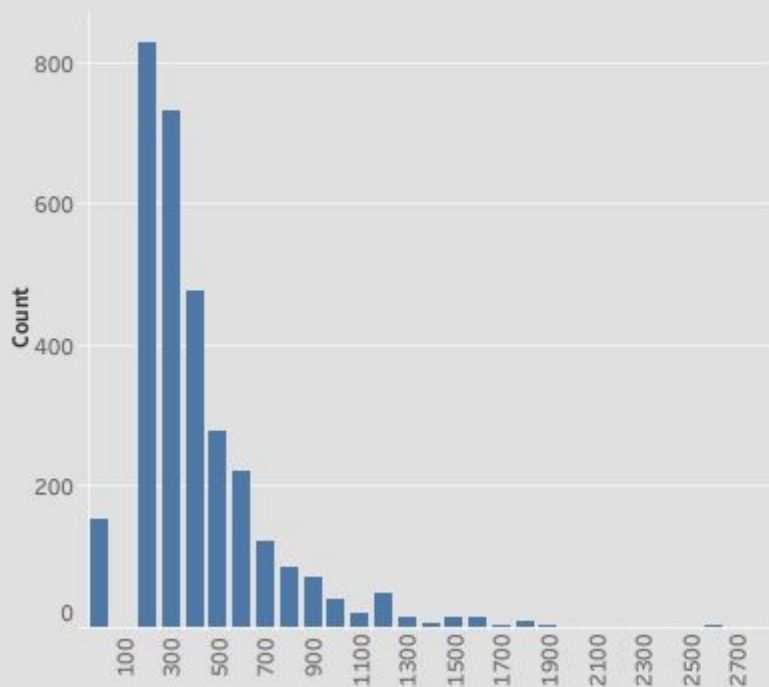

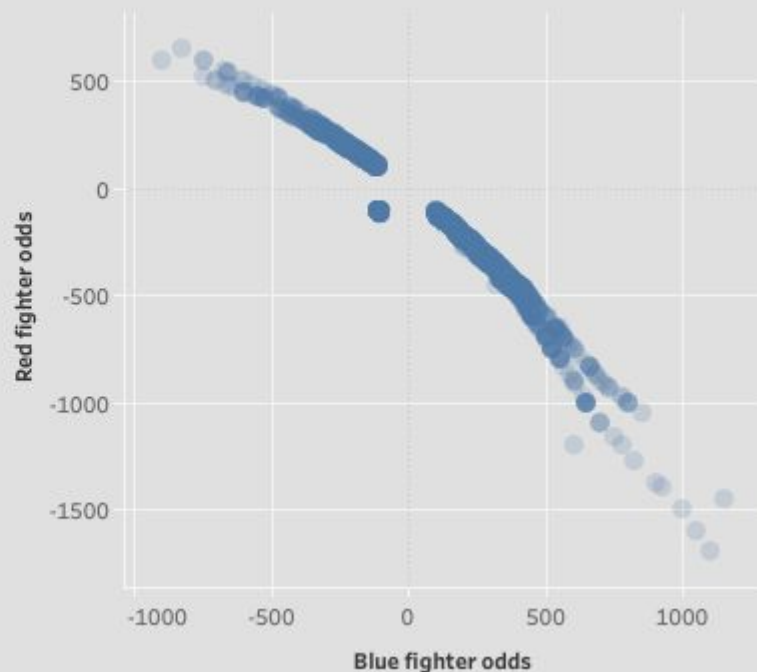Conor McGregor (vs. Khabib Nurmagomedov) – Mean odds
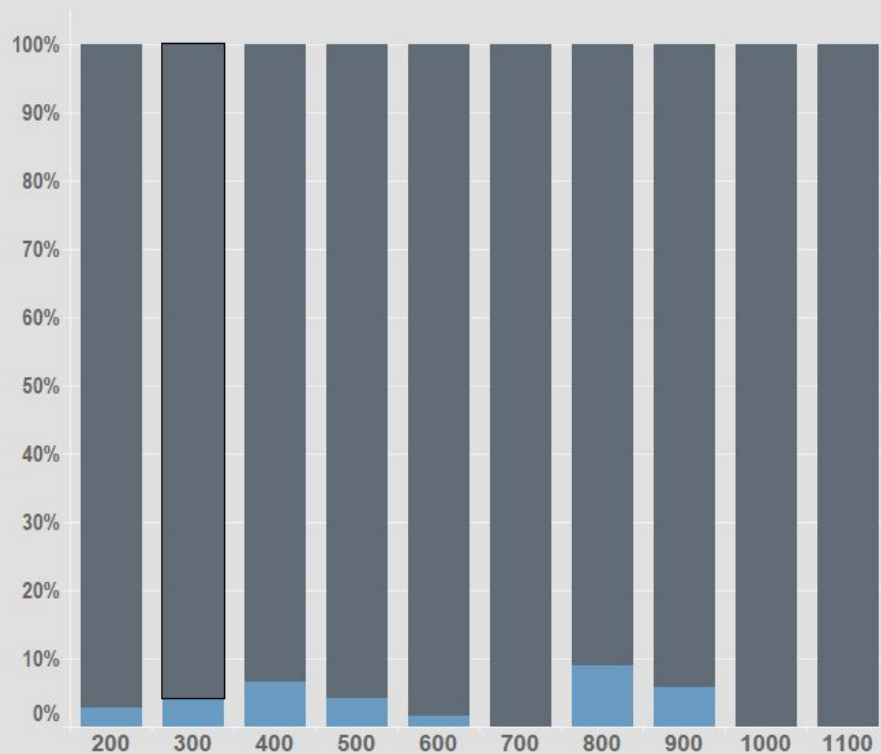
Appendix - EDA

Distribution of all spreads

All pairings of odds

Appendix - EDA

Number of upsets in %, by spread

Number of upsets in %, by fight type