Football Championship Ticket Options

Introduction

Since its adoption in the 2014-2015 season, the College Football Playoff (CFP) has given college football fans even more reason to be excited about rankings. No longer did a team need to be in the top 2 of the Bowl Championship Series (BCS) to be a championship contender – instead, the top 4 teams entered into a playoff. In capitalizing on the intersection between excitement and fandom, the CFP teamed with OptionIt to introduce an RSVP system for championship game tickets, starting in 2018. A fan may by an RSVP (an option) for a team. If that team would make it to the championship game, then the fan holding the option would be able to purchase a ticket at face value. In the end, this is likely to save fans a considerable amount of money as compared to purchasing tickets on the secondary market – tickets on the secondary market were estimated to be an average of $2,689 for the 2018 Championship game. In financial modeling terms, this system could be considered a call option for speculation. When buying an option (the RSVP), the buyer has the right to buy a stock (a ticket) in the future at the strike price (the face value of the ticket).

There is certainly a huge amount of speculation built into this – at present an option for a lower-level seat for Alabama is very nearly $600. This is a considerable financial risk when purchasing such an option. Coupled with a possible face value around $800, a fan buying an option for $600 could easily have $1,400 wrapped up into a ticket. This is still less money than what would be spent on the secondary market, so the reward is potentially high.

A source of inquiry is what drives the price of these RSVPs. Before the season begins, would knowing a teams performance during the previous year drive prices? Would preseason ranking have any influence on prices? After the start of the season, would rankings, performance, injuries, or other variables affect prices? These questions will be explored throughout our paper.

Hypotheses

Methods

Data

The internet is full of interesting data and finding it is never too hard. While finding interesting data does not present a challenge, finding data that is free to use can be tricky. In the context of data, free to use does not necessarily mean free in a monetary sense. Instead of a paywall, data is often locked behind terms of service (ToS). While scraping data has become easier, data creators are getting more sophisticated at "hiding" the data (i.e., it is not sitting nicely within the html, but loads through Javascrip) or ToS. With the appropriate accumen, the location of the data ceases to pose a challenge; the same cannot be said for ToS. In scraping our data, we not only read the ToS, but we also examined each site's robots.txt. Since we wanted to conduct our data collection in a programmatic fashion, we wanted to ensure that we were not going to be running afoul of restrictions placed within the robots.txt file. To that end, all the data that we collected is free to use – in other words, no restrictions apply.

Sources

Given the research questions, we sought to collect data from several different sources. Given the excellent compilation of team rankings, Massey's website was used to amass rankings.

Injury counts were pulled from Don Best's website and projected winners were pulled from XXX.

Finally, the RSVP data was pulled from the json object on the CFP-RSVP site. While the main page displays the current option price for an upper-level ticket (UL_price), the json object also contains prices for

lower-level tickets (LL_price). There are also different hotel packages within the data, but our primary focus will be on the two ticket prices.

Issues and Limitations

The RSVP data presented a few challenges along the way – mainly that the data source changed at some point during the course of data collection. This data source change resulted in a considerable span of data loss. Further, issues arised on the automatic nature of data collection. Windows Task Scheduler was used to automatically run our data collection scripts daily – unfortunately, this will not run if a computer is shut down. Finally, new ratings were added to the Massey Ratings page. Given the position of the Massey ratings in our data join, many columns became displaced from their original position. While this was fixed, some values were not recovered.

Results

Previous Year-end Rank and Early Prices

As a starting point, we began by looking at Massey's year-end rankings and early option prices (February 2018).

In an effort to reduce visual clutter and focus on potentially high-value teams, we can visually inspect the top 25 teams at the end of the 2017-2018 season.
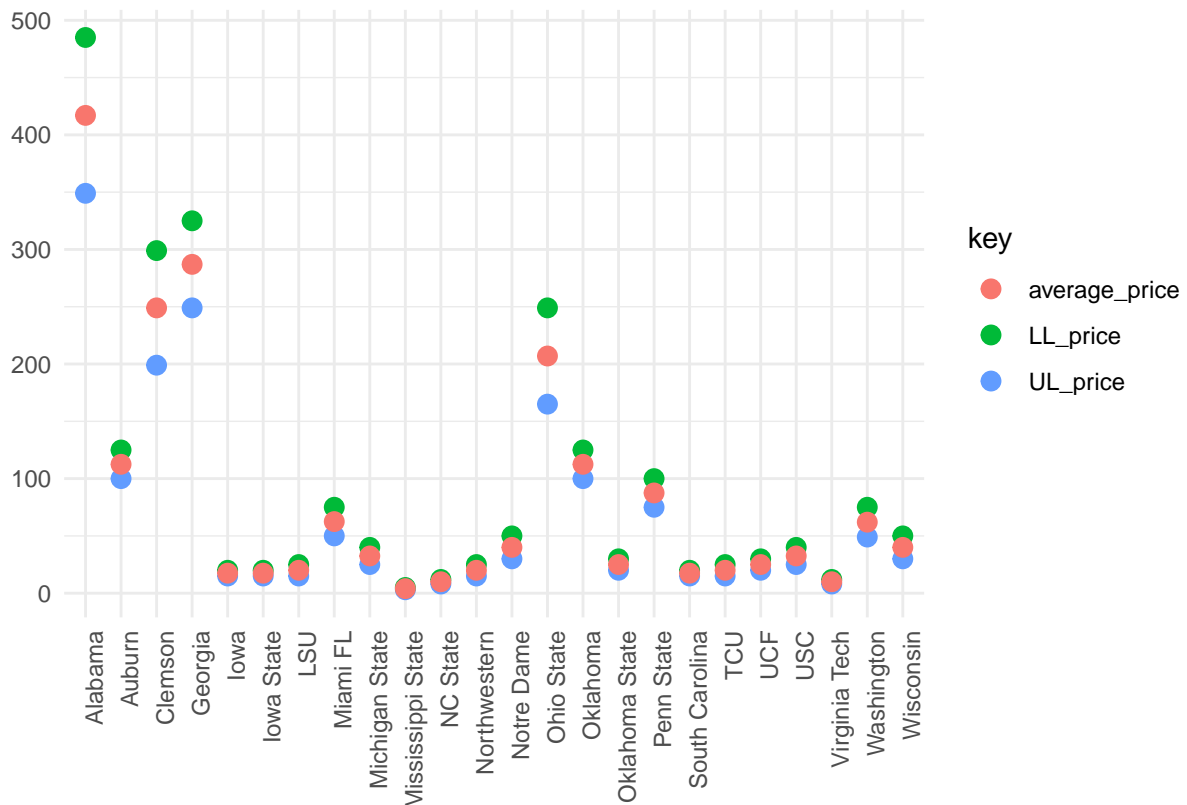
The preceding visualization provides a clear picture

Ranking Correlations

For the sake of exploration and to limit the chances of future multicollinearity, we wanted to explore how some of the more well-known ranking were correlated:
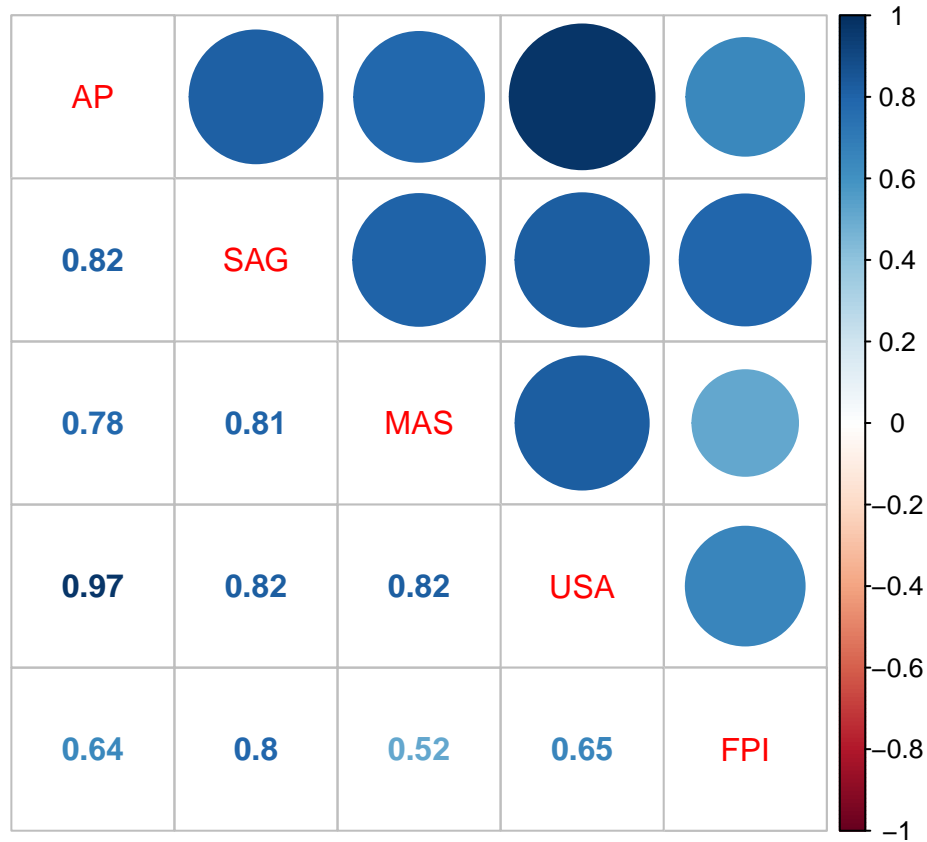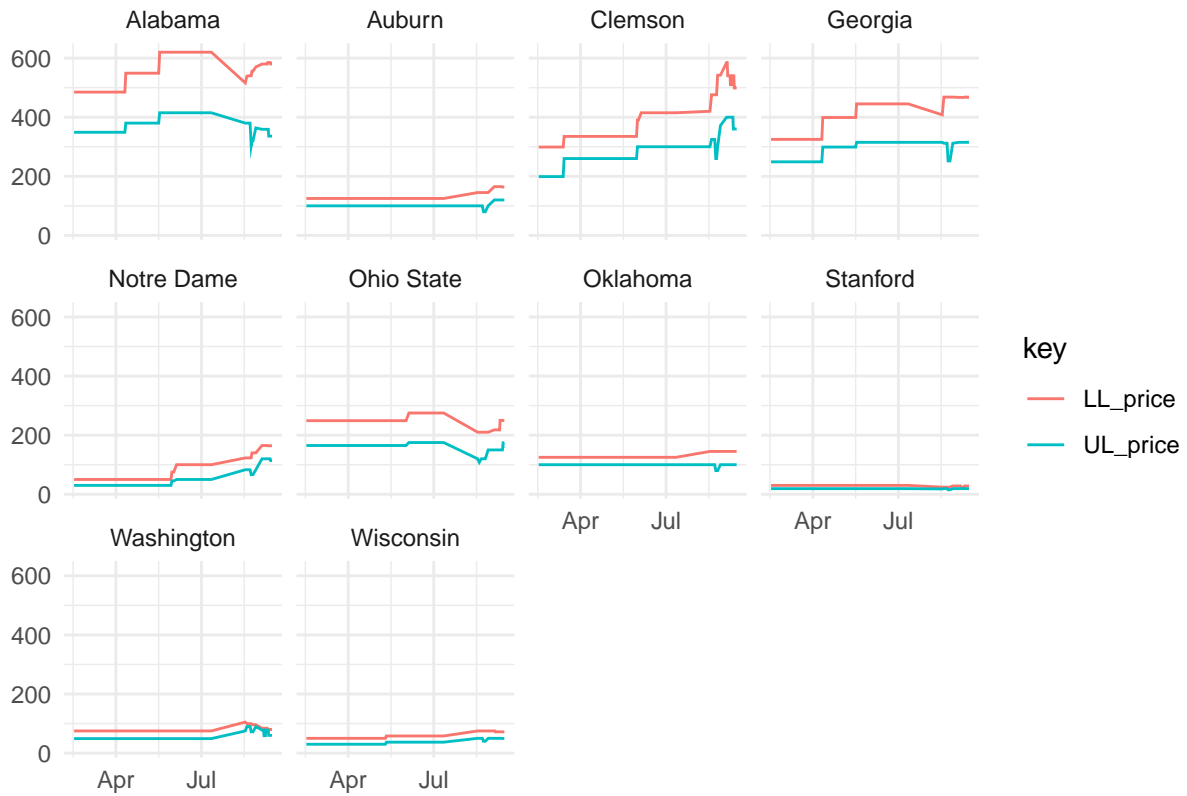

Generally, strong correlations are present. For upcoming models, we will opt to use AP, MAS, and USA

Replicating Rankings Through Option Prices

Top 10 Trends

The following figure shows the price trend for every team that has been in the AP top 10 since the beginning of the season.

A quick visual inspection of every team that has been in the top 10 this year might suggest persistent high confidence for Alabama, Clemson, and Georgia (but to a slightly less degree). Not surprisingly, Ohio State and Oklahoma are starting to trend upwards; meanwhile, Notre Dame has consistently high prices (relatively speaking), but on a potential downward trend.
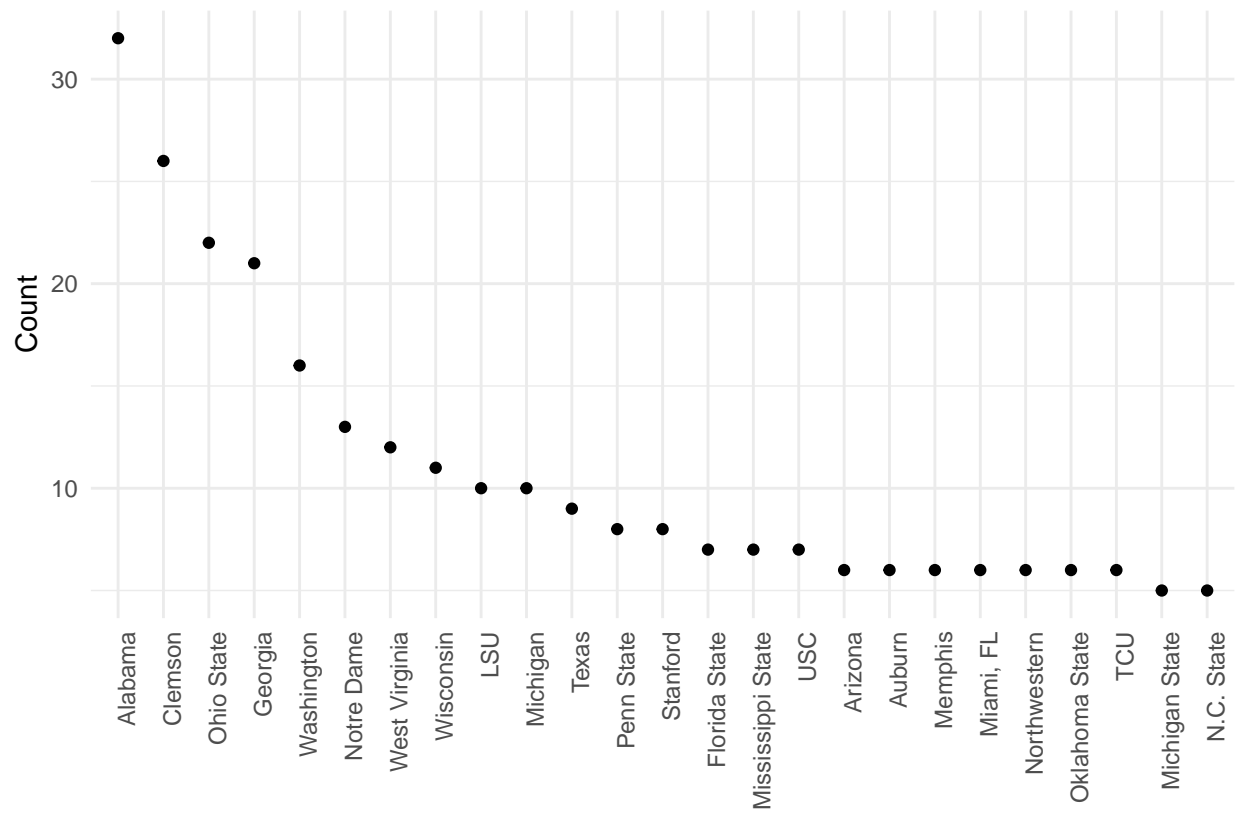
Volatility

While the intervals in our option price series are not always equivalent, calculating a team's option price volatility can instructive.
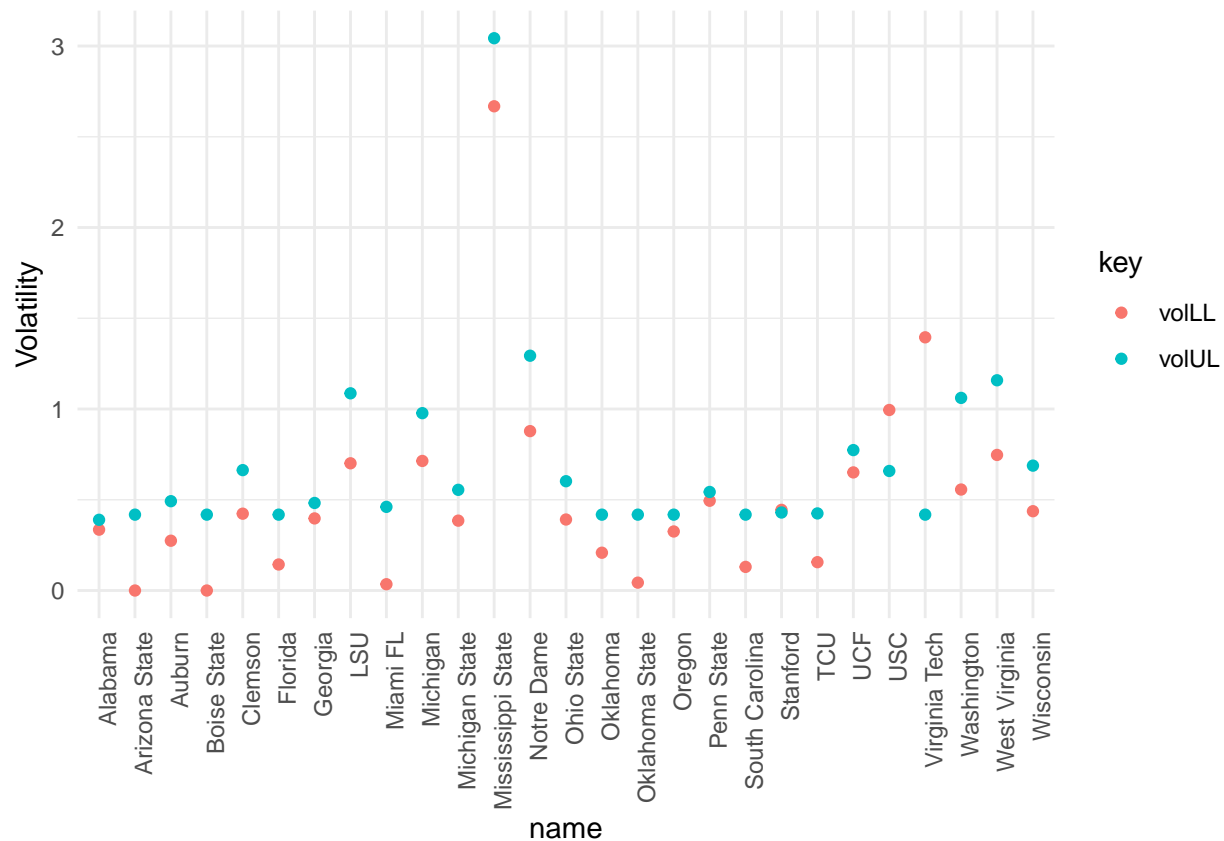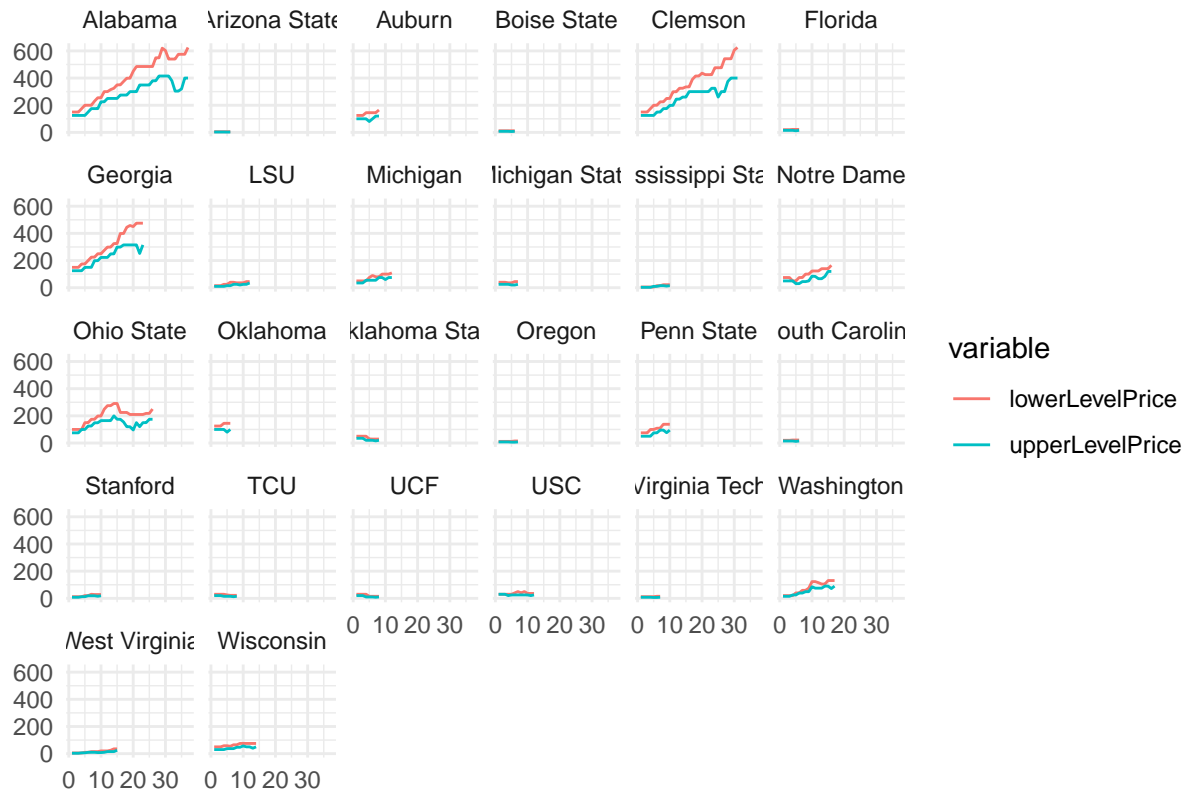
We can compare these plotted volatility values with the values that CFP-RSVP uses to graphically illustrate a team's price trend.

First, we can see which 25 teams have had the most price changes throughout the CFP-RSVP's existence. Note that the following table displays total price changes (includes both upper and lower level changes).

A cursory glance of the listed names should look familiar.

We can also plot the series for all of those teams which have appeared in the top 25 this season:

Alabama　Arizona State　Auburn　Boise State　Clemson　Florida
Georgia　LSU　Michigan　Michigan State　Mississippi State　Notre Dame
Ohio State　Oklahoma　Oklahoma State　Oregon　Penn State　South Carolina
Stanford　TCU　UCF　USC　Virginia Tech　Washington
West Virginia　Wisconsin

variable
— lowerLevelPrice
— upperLevelPrice

Explaining Volatility

term	edf	ref.df	statistic	p.value
s(Mean)	1.336916	1.596542	9.660006	0.0004323
s(n)	7.922553	8.630275	1.763233	0.0630559

term	estimate	std.error	statistic	p.value
(Intercept)	0.4894216	0.1321306	3.704074	0.0003869
wins	-0.1995868	0.0985400	-2.025440	0.0461260

term	edf	ref.df	statistic	p.value
s(Mean)	1	1	5.358452	0.0229027
s(n)	1	1	1.032345	0.3123710

term	estimate	std.error	statistic	p.value
(Intercept)	0.6324360	0.0996889	6.344098	0.0000000
wins	-0.0759144	0.0736147	-1.031240	0.3052542
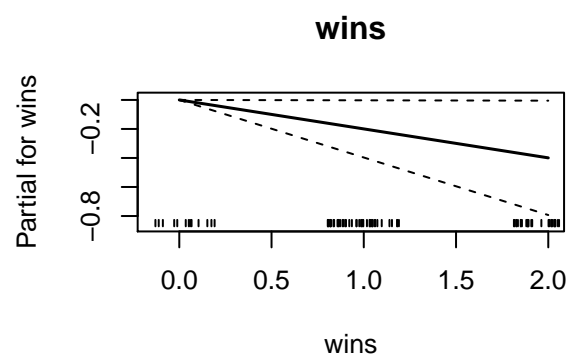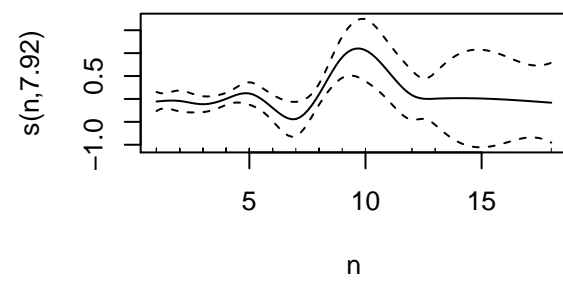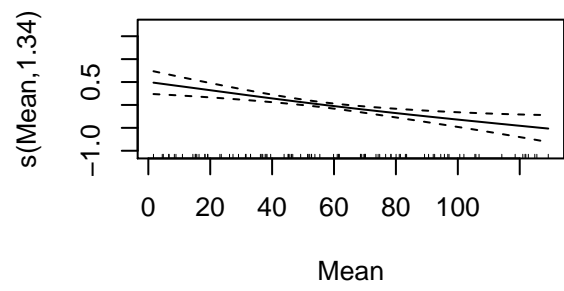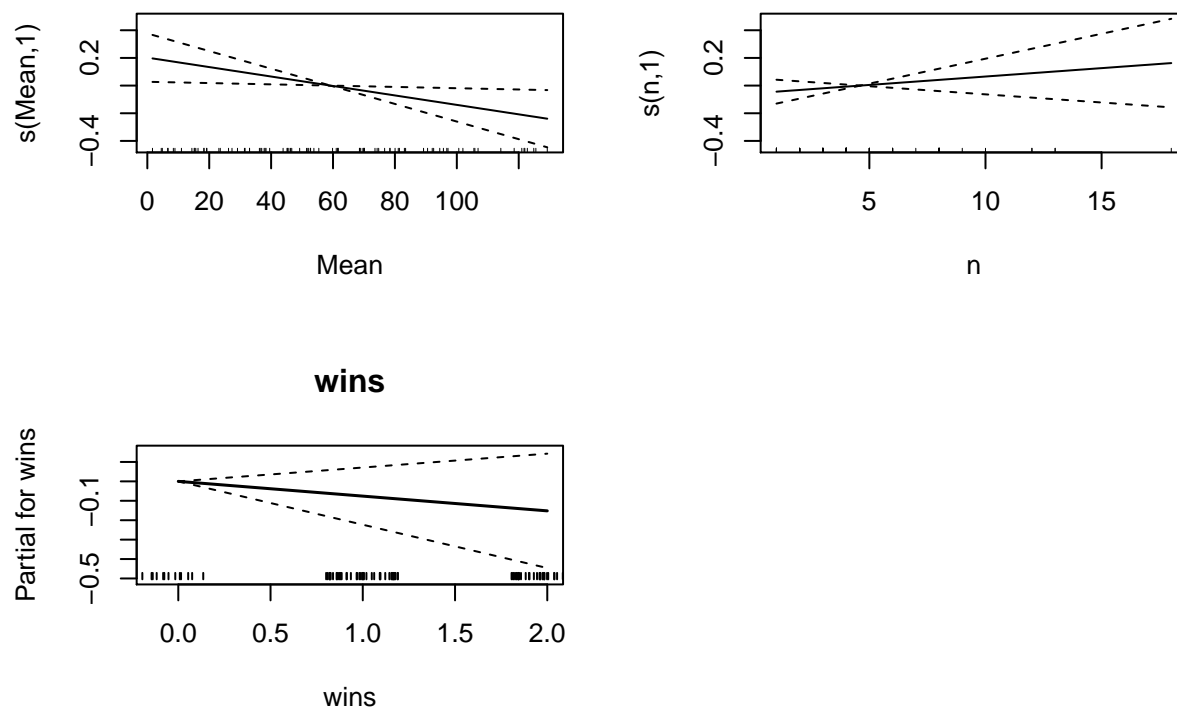
wins

Explaining Current Prices

term	edf	ref.df	statistic	p.value
s(Mean)	8.41878	8.903729	26.84141	0.0000000
s(n)	1.00000	1.000000	10.60581	0.0016343

term	estimate	std.error	statistic	p.value
(Intercept)	61.41776	14.01788	4.381386	0.0000352
wins	-19.63159	10.37917	-1.891442	0.0621584

term	edf	ref.df	statistic	p.value
s(Mean)	8.122713	8.789806	24.264496	0.0000000
s(n)	1.000000	1.000000	8.960476	0.0036343

term	estimate	std.error	statistic	p.value
(Intercept)	41.28982	9.572957	4.313173	0.0000451
wins	-13.24408	7.087098	-1.868759	0.0652768

wins

wins
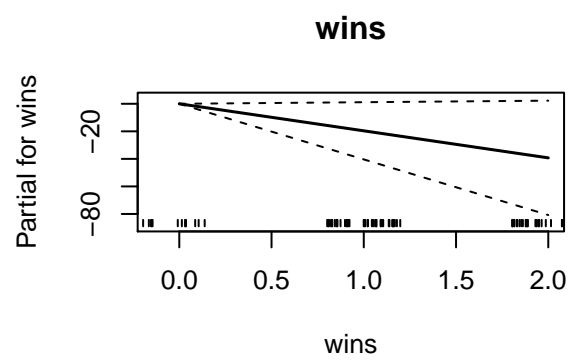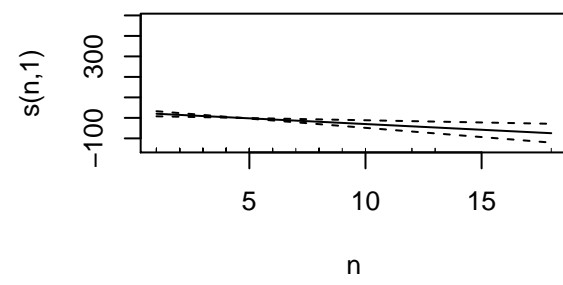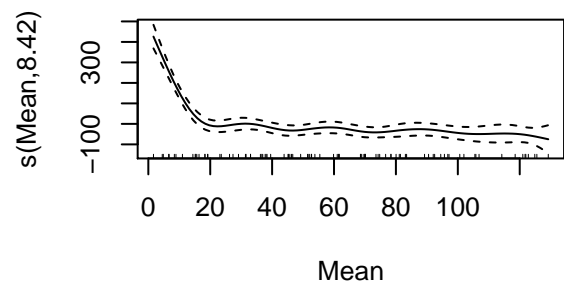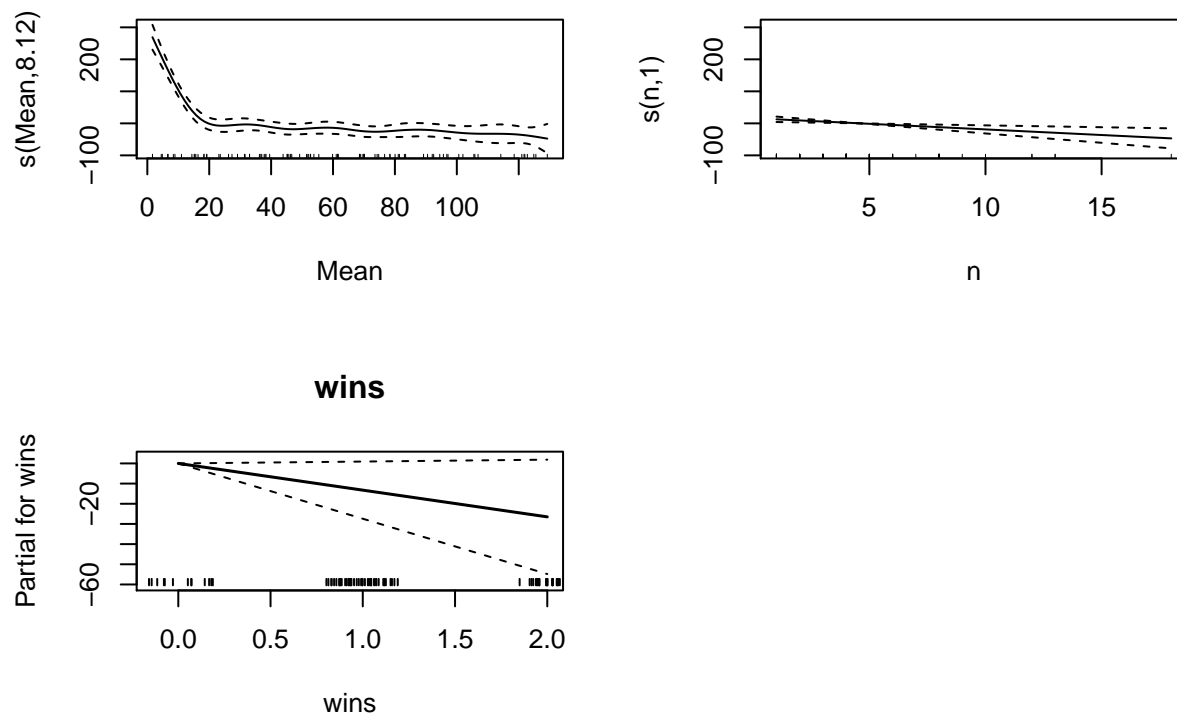
Take Away Messages

While we don't have data back to the inception of CFP-RSVP, we do have a pretty broad swath. Given our visualizations and our models, the strategy is clear: buy early and buy towards the top of the projected rankings. There is no such thing as parity within college football; of the possible 16 slots combined over the last 4 years, there have been 10 unique teams in the playoffs (with Alabama making 4 appearances, Clemson making 3 appearances, and Ohio State and Oklahoma each having 2 appearances). We would likely invest early in the teams that are likely to be around when the playoffs start.