

Deciphering the Signal and the Noise

Understanding How FiveThirtyEight's 2016 Election
Forecast Works in Order to Gain Confidence in
Predictive Modeling

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Executive Summary

I wrote this paper in the spring of 2017 as an assignment for Tufts' Engineering Management 52: Technical and Managerial Communication, a course taught by Amy Hirschfeld.

The purpose of this paper is to demystify the technical aspects of FiveThirtyEight's Election Forecast and discuss why FiveThirtyEight's model might have failed to predict the results of the 2016 election. The fundamental goal of this paper is to help readers feel more comfortable with FiveThirtyEight's model, their results, and election forecasting in general so that they might be part of a well-informed electorate and in turn a well-informed democracy.

My scope of research included an overview of how FiveThirtyEight's model made predictions for the 2016 presidential election. This paper also includes a discussion of some important shortcomings that are present in FiveThirtyEight's forecasting model and how these shortcomings likely led to FiveThirtyEight's failed predictions in the 2016 election.

In order to make its predictions, FiveThirtyEight's Election Forecast model first accumulates three main types of data, including outside polling data, economic indicator data, and ratings for individual pollsters. Once this data is aggregated, the Election Forecast then begins to make a series of calculations and adjustments to generate its predictions. In short, the model first calculates 51 weighted averages (one for each state plus the District of Columbia). It then applies various adjustments to correct for any known artificial polling skews that can add error to polls. After applying these adjustments, FiveThirtyEight's model calculates any necessary point adjustments that might be needed to account for demographic differences. The model then adds one final adjustment that enables the model to capture changes in the strength of the U.S. economy. This final adjustment provides the model with a more comprehensive understanding of the election beyond exclusively rely on polling data without considering other exterior influences. Finally, the model combines each of the 51 adjusted averages to form a single weighted average, which is the final output of the model.

The Election Forecast's failure to accurately predict the 2016 election illustrates a number of important considerations for predictive modeling. First, because most forecasting models are driven by probabilities, readers should be careful with how they might interpret a model's results and remember that probabilities, even high ones, do not indicate absolute certainty. The failures of FiveThirtyEight's model also highlight how many forecasts can be heavily influenced by outside errors. In the case of election forecasts, these errors traditionally come from the inherent errors present in polling data. Finally, both forecasters and those viewing forecasts should acknowledge the fact that probabilistic models will always have some amount of uncertainty. I therefore encourage creators and users of these forecasts to become more comfortable with this uncertainty for the sake of better forecasts in the future.

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Definitions

Consumer Price Index	An index published by the U.S. Bureau of Labor statistics on the variation in prices paid by typical consumers for retail goods and other items.
Incumbent Party	The political party of the current sitting president.
Index	A statistical measurement of change to represent a group of data points.
Industrial Production Index	An economic indicator published by the U.S. Federal Reserve that measures the production output of manufacturing, mining, and utilities in the United States.
Likely Voter	A poll respondent who is registered to vote and who is part of a particular demographic group that indicates he or she is likely to vote.
Partisan Voter Index	A measurement of how likely a particular demographic group is to vote for a certain candidate or political party.
Political Action Committee (PAC)	An organization that raises money privately to influence elections or legislation.
Polling House	A firm who conducts or analyzes political opinion polls.
Real Personal Consumption Expenditures	An index published by the U.S. Federal Reserve that measures price changes for consumer goods and services.
Real Personal Income	An index published by the U.S. Bureau of Economic Analysis that reports the average personal income in the United States.
Registered Voter	A poll respondent who is registered to vote in their state or congressional district.
Regression	A measure of the strength of a relationship between multiple variables.
Standard & Poor's 500	A stock market index based on the performance of 500 large U.S. companies.
Super PAC	A type of political action committee that can solicit and spend an unlimited amount of money but cannot be directly affiliated with any particular candidate or party.
Trend Line	A line that shows the general tendency of a dataset.

Abbreviations and Initialisms

PAC	Political Action Committee (see <i>Definitions</i> for more details)
PVI	Partisan Voter Index (see <i>Definitions</i> for more details)
S&P 500	Standard & Poor's 500 (see <i>Definitions</i> for more details)

1.0 Introduction

1.1 Purpose

The purpose of this paper is to outline how exactly FiveThirtyEight's Election Forecast modeled the 2016 presidential election and discuss why FiveThirtyEight's model might have failed to predict the outcome of the election. Throughout the 2016 presidential election, most major news outlets and polling houses, including FiveThirtyEight, predicted Hillary Clinton as a heavy favorite for the presidency. However, when Clinton ultimately lost to Donald Trump, many people seemed to express shock. In the days, weeks, and months following November 8, many people questioned why so many polls and election forecasts failed to predict the election. These questions have in turn cast doubt on whether predictive models work as many modelers promise.

In response to these questions, the grander purpose of this paper is to demystify the technical details of large statistical models, such as FiveThirtyEight's Election Forecast, so the audience might feel more comfortable with predictive models in general. With more comfort for predictive models, the audience is more likely to understand and trust well-made election models, even if they might sometimes fail, which in turn leads to a more informed and equipped electorate, a fundamental part of any successful democracy.

1.2 Scope

In order to illustrate how FiveThirtyEight's model works, this paper includes an overview of the process FiveThirtyEight used in its Election Forecast. I have first included some background on FiveThirtyEight and their Election Forecast model, including the performances of the model in 2008, 2012, and 2016. I then describe the technical details of how

FiveThirtyEight's Election Forecast Polls-Plus model¹ took in data and output predictive election results. After this technical description, I discuss how the failure of the 2016 Election Forecast illustrates a few common shortcomings of predictive models in general.

This paper includes a general technical overview of the Election Forecast but it does not include explanations of every technical detail. Additionally, though the Election Forecast does rely on data from FiveThirtyEight's Pollster Ratings project, I have not given an explanation of how these ratings are calculated.²

1.3 Background on FiveThirtyEight and their Election Forecast

FiveThirtyEight is an online news organization that focuses on delivering data-driven analysis on political, economic, and sports-related news. Nate Silver founded FiveThirtyEight in 2008 after he gained success by consistently predicting results for the 2008 U.S. presidential primaries (Romano 2010). After gaining a following in mid-2008, Silver began writing about his predictions for the 2008 general election using the first iteration of the FiveThirtyEight Election Forecast model. Silver's predictions for the 2008 election proved to be quite accurate, which further grew his following.

After a successful 2008, Silver continued to improve his forecasting model as well as grow the team of contributors working for FiveThirtyEight. In the midst of the 2012 presidential election, the FiveThirtyEight team continuously published analysis of the election, including updates on the predicted outcome based on Silver's model. That year, the FiveThirtyEight

¹ FiveThirtyEight provided three versions of its Election Forecast: a polls-plus model, a polls-only model, and a now-cast model. This paper includes details on how only the polls-plus model works. The polls-only model followed similar methods to the polls-plus model, but it skipped certain calculations and considerations. The now-cast model also used somewhat similar calculations, but it made predictions as if the election were to occur on the day of calculation instead of November 8.

² For more details on FiveThirtyEight's process for forecasting, including information on the Pollster Ratings system, Nate Silver has published a full description on how the 2016 Election Forecast worked (Silver 2016b).

Election Forecast was able to accurately predict the electoral college results of all 50 states plus the District of Columbia (Jackman 2012).

Following the success of their 2008 and 2012 models, FiveThirtyEight again published an updated Election Forecast model for the 2016 presidential election, which is the focus of this paper. Leading up to Election Day 2016, FiveThirtyEight predicted a win for Hillary Clinton over Donald Trump. However, Silver and FiveThirtyEight were unable to repeat their past successes as Trump ultimately won the election. The 2016 Election Forecast missed a number of significant state results in the general election, which lead to their most inaccurate year to date (Bialik and Enten 2016).

1.4 Historical Performance of FiveThirtyEight's Election Forecast

To better understand FiveThirtyEight's Election Forecast model, it is helpful to examine the model's prior predictions and how these predictions compare to the real results. Table 1 includes FiveThirtyEight's election projections from 2008, 2012, and 2016, as well as the actual results from these elections.

Table: Projected and Actual Results of the 2008, 2012, and 2016 Presidential Elections

Election Year	FiveThirtyEight Projected Results			Actual Results ³	
	Winner	Share of Popular Vote	Electoral Votes	Share of Popular Vote	Electoral Votes
2008	Barack Obama ⁴	52.4%	349 - 353	52.9%	365
2012	Barack Obama ⁵	50.9%	332	51.1%	332
2016	Hillary Clinton ⁶	48.5%	301.6	48.2%	228

In both 2008 and 2012, Nate Silver and the FiveThirtyEight team projected wins for Barack Obama, which turned out to be correct both times. While both of Silver’s 2008 projections (electoral votes and popular votes) were not exactly correct, these were some of the most accurate electoral predictions to date (Romano 2010). On a state level, Silver’s 2008 model correctly predicted results across the United States except for Indiana and one district in Nebraska (Silver 2014b). In their 2012 projections, FiveThirtyEight improved upon their projection accuracy by correctly predicting all 50 states (plus the District of Columbia), which in turn lead to perfectly projecting the electoral college vote (Jackman 2012).

Throughout the 2016 election cycle, FiveThirtyEight projected a fairly heavy win for Hillary Clinton, which ultimately proved incorrect. As they were in 2012, FiveThirtyEight was accurate in predicting the popular vote. However, FiveThirtyEight’s electoral vote predictions were off in six significant swing states, which was enough to ruin their overall prediction for a

³ “List of United States presidential elections by popular vote margin.” 2017. Wikipedia. Wikimedia Foundation. March 26.

https://en.wikipedia.org/wiki/List_of_United_States_presidential_elections_by_popular_vote_margin.

⁴ Silver, Nate. 2014b. “Today’s Polls and Final Election Projection: Obama 349, McCain 189.” FiveThirtyEight. ESPN. May 7. <https://fivethirtyeight.com/features/todays-polls-and-final-election/>.

⁵ Jackman, Simon. 2012. “Pollster Predictive Performance, 51 out of 51.” The Huffington Post. TheHuffingtonPost.com. November 7. http://www.huffingtonpost.com/simon-jackman/pollster-predictive-perfo_b_2087862.html.

⁶ Silver, Nate. 2016a. “2016 Election Forecast.” FiveThirtyEight. ESPN. June 29. <https://projects.fivethirtyeight.com/2016-election-forecast/>.

Clinton win (Bialik and Enten 2016). Though 2016 was by far the most inaccurate year for FiveThirtyEight's Election Forecast, their forecast was more accurate than most other models.⁷

2.0 Data FiveThirtyEight's Election Forecast Relies On

2.1 Outside Polling Data Used in FiveThirtyEight's Election Forecast

FiveThirtyEight's 2016 Election Forecast primarily relied on outside polling data. FiveThirtyEight's model included almost every state and national poll that was published by any major polling house throughout the 2016 election cycle (Silver 2016b). However, FiveThirtyEight did exclude certain polls. If a poll was conducted by or on behalf of a presidential campaign, a party-affiliated PAC, or super PAC, the poll was not included. Additionally, if the pollster that conducted the poll was on FiveThirtyEight's banned pollster list,⁸ the poll was not included.

2.2 FiveThirtyEight's Pollster Rating System

In order to measure the validity and accuracy of the outside polling data, FiveThirtyEight also used ratings calculated from their Pollster Rating system. The system works independently of the Election Forecast model and is used to quantify the legitimacy and accuracy of a pollster (Silver 2014a). FiveThirtyEight has calculated rankings for each pollster,

⁷ For comparison, throughout 2016, *The New York Times* published results from a predictive model similar to FiveThirtyEight's model. On November 8, *The New York Times*' model predicted Clinton to win 322 electoral votes and win the popular vote by almost 5% (Aisch et al. 2016).

⁸ The FiveThirtyEight banned pollster list is made up of pollsters that FiveThirtyEight determined to be faking data or conducting unethical behavior in their polls (Silver 2014a).

and the Election Forecast model use these rankings to determine how heavily a particular poll was factored into the model's calculations (Silver 2016b).

2.3 Economic Indicators Used in FiveThirtyEight's Election Forecast

In order to supplement the polling data and to give the model a more comprehensive understanding of the election, FiveThirtyEight also used data to represent the current state of the U.S. economy. More specifically, the Election Forecast aggregated six economic indicators to generate a single metric for the strength of the U.S. economy (see Section 3.5 for how this metric is computed) (Silver 2016b). These six indicators were the following measurements:

- The strength of the jobs market, which came from the number of employed persons.
- The strength of U.S. manufacturing, which came from the Industrial Production Index.
- The average income in the U.S., which came from the Real Personal Income.
- The amount of consumer spending in the U.S., which came from the Real Personal Consumption Expenditures.
- The current rate of U.S. inflation, which came from the Consumer Price Index.
- The strength of the U.S. stock market, which was based on the value of the S&P 500.

3.0 Calculations FiveThirtyEight Makes in Its Election Forecast

3.1 Calculation of Weighted Averages

Using all of the polls included in the model, FiveThirtyEight first calculated a weighted average of the polling results for each state (Silver 2016b). To calculate this weighted average, each poll was assigned a weight, which was a function of the rating for the pollster that conducted the poll, as calculated by FiveThirtyEight's Pollster Ratings; the sample size of the

poll, for which polls with a larger sample sizes were given more weight; and the recentness of the poll, for which more recent polls were given more weight. All of the polls in each state were then aggregated, giving more influence to polls with larger weights.

3.2 Addition of Individual Poll Adjustments

Once the model calculated a weighted polling average for each state, FiveThirtyEight’s Election Forecast then made poll-specific adjustments to these averages (Silver 2016b). These adjustments were all based on known election trends that might cause artificial skews in polling data. In order to correct for these skews, FiveThirtyEight added or subtracted points from an individual candidate’s polling numbers if he or she was benefitting from these skews. These adjustments were applied in order as follows:

- A likely voter adjustment, which was used to normalize polls of registered voters and polls of all adults so they were more similar to polls of likely voters.⁹
- A convention bounce adjustment, which was used to account for the artificial polling boosts candidates see immediately following party conventions.¹⁰
- A “missing Johnson” adjustment, which was used to account for polls that do not include Gary Johnson. This adjustment was done by equally distributing a small number of points from Clinton and Trump to Johnson.

⁹ Historically, Republicans generally have a slight advantage (between one and two percentage points) in polls of likely voters. The Election Forecast model took this historical advantage into account in its calculation of averages.

¹⁰ See Figure 1 for a representation of what convention bounces traditionally look like and how FiveThirtyEight hopes their model will account for them.

- A trend line adjustment, which was used to detect overall changes in state polls that were conducted by the same pollster.¹¹ This adjustment was calculated by generating trend lines for each candidate’s polls and merging these trend lines into the overall point totals using a “smoothing factor.”¹²
- A house effect adjustment, which was used to normalize for the partisan biases, or “leans,” from certain pollsters.¹³ To account for these “leans,” FiveThirtyEight calculated the bias of each specific pollster based on how much they differed from the average of each state. The model then subtracted points from the candidates based on how partisan a pollster was and how many polls that pollster had conducted. For example, if a specific pollster had a three point Democratic-lean, the model might subtract one point from Clinton’s numbers if the pollster had conducted only one or two polls, but the model might subtract 2.5 points if that pollster had conducted dozens of polls.

3.3 Adjustment for Third-Party Voting

After adjusting each candidate’s overall polling percentages, the Election Forecast reallocated a portion of points from Gary Johnson (and other third-party candidates) to the undecided category (Silver 2016b).¹⁴ However, as election day approached, a smaller and

¹¹ For example, say Gallup published two polls, a February poll that indicated Clinton leading by 1% and an April poll that indicated Clinton leading by 3%. Given these polls, FiveThirtyEight’s model would perceive this as an upward trend for Clinton and adjust her overall point totals to match.

¹² The “smoothing factor” determined how straight a trend line should be. The less smoothing present in the regression indicates a more aggressive prediction. As a result, over the course of the election, the smoothing factor was reduced over time, indicating a more aggressive prediction as November 2016 approached.

¹³ For example, FiveThirtyEight cited Rasmussen Reports polls as typically being Republican-leaning, in comparison to other polls (Silver 2016b).

¹⁴ Third-party candidates traditionally underperform in elections when compared to early polling data, because many respondents who claim to be for a third-party candidate actually end up voting for one of the two major parties. As a result, FiveThirtyEight redistributed third-party votes to the undecided category (Silver 2016b).

smaller portion of third-party votes was reallocated because third-party poll responses were more likely to be actual third-party voters.

3.4 Adjustment for Polling Demographics

After allocating undecided voters to each candidate's percentages in each state, FiveThirtyEight calculated demographic-based regressions and combined these with the previously calculated state point totals (Silver 2016b). FiveThirtyEight's model used these regressions in order to account for any state biases that might have existed, including higher favorability for a particular candidate in his or her home state.¹⁵

In order to account for these biases, the model calculated a number of partisan voter indices, or PVIs,¹⁶ which are measurements of how much a demographic group might lean either Democratic or Republican (Wasserman 2012).¹⁷ The Election Forecast used three specific PVIs to account for demographics: one for state-specific demographics, one for region-specific demographics, and one for race and religion demographics (Silver 2016b). These various demographics were then merged into a single weighted average based on the individual polling histories of each demographic in order to represent all demographics as a whole. This single weighted demographic average and the totals calculated after allocating undecided voters were combined using a "smoothing factor" similar to the one used in the trend line adjustment (see Section 3.2).

¹⁵ Because both Donald Trump and Hillary Clinton are from New York, this home-state advantage came out as a net-zero effect for the presidential candidates. However, FiveThirtyEight's model also accounted for home-state advantage for vice presidential candidates, so it expected to see a two-point percentage bump from Virginia and Indiana for the Democratic and Republican tickets respectively.

¹⁶ The use of PVIs was first popularized by *The Cook Political Report* in August 1997 (Wasserman 2012).

¹⁷ See Figure 2 for a map of PVIs from the 2012 election

3.5 Adjustment for Economic Conditions

After incorporating state and regional demographic adjustments, the model then factored in an index that accounted for the current state of the U.S. economy (Silver 2016b). By including this index, the Election Forecast gave greater context to its predictions beyond just polls. This index was built using six economic variables that, when combined, illustrated the strength of the 2016 economy relative to the economy during previous elections. As described in Section 2.3, these six variables measured the strength of the jobs market, the strength of U.S. manufacturing, the average income in the U.S., the amount of consumer spending in the U.S., the current rate of U.S. inflation, and the strength of the U.S. stock market.

After calculating these six individual variables, the model then normalized each variable, so that they all had the same mean and the same standard deviation. Once normalized, these variables were then combined into a simple average (Silver 2016b), which represented FiveThirtyEight's economic index. Based on how much the index differed from the historical average (over the prior 50 years), additional percentage points were assigned to the candidate from the incumbent party.¹⁸ For example, if the economic index had been 0.5 standard deviations above the historical average, Hillary Clinton would have been given between four and five additional percentage points nationally.

3.6 Simulation of the National Election by Combining State Results

After adding these additional percentage points based on the economic index, FiveThirtyEight's Election Forecast would output its final percentage points, along with

¹⁸ Throughout the 2016 election, FiveThirtyEight's economic index indicated the U.S. economy was more or less average in comparison to the historical average. As a result, the economic index did not play much of an effect in the 2016 Election Forecast (Silver 2016b).

percentage errors, for each of the 50 states. These state point totals (along with their percentage errors) were then combined into a final weighted average, for which the weight of each state was determined by the number of state electoral votes and the state's historical correlation to other states.¹⁹ The final weighted averages for national percentage points and for national percentage error were then output on FiveThirtyEight's website.²⁰

4.0 Audience Considerations for Election Forecasts

4.1 Doubt Surrounding Election Forecasting

After FiveThirtyEight (and a number of other polling outlets) failed to predict the results of the 2016 election, a number of news organizations cast doubt on the merits and usefulness of predictive modeling for election forecasting. These news outlets used the inaccurate predictions for the 2016 election as evidence to show that statistical modeling might not be as accurate as modelers claim and ultimately that the science of election forecasting was useless (Bialik and Enten 2016).

Though the prediction failures of 2016 do illustrate some shortcomings of election forecasting, these shortcomings do not indicate an absolute failure in predictive modeling. The following section is a discussion of these shortcomings, how they affected FiveThirtyEight's forecasting, and why they do not necessarily indicate that election forecasting is a useless science.

¹⁹ See Figure 3 for a matrix representing the correlation of eight choice state results.

²⁰ FiveThirtyEight ran the model every time a new poll was added, which in turn updated the final weighted averages displayed on the website. These values were generally updating more than five times a day.

4.2 Recognition of the Probabilistic Nature of Election Forecasts

One of the most important considerations when discussing the merits of statistical modeling is the fundamental probabilistic nature of election forecasts. On November 8, 2016, FiveThirtyEight's Election Forecast projected Donald Trump had a 28.2% chance of winning the election (Silver 2016a). For comparison, Trump had a slightly greater chance to win than if someone were to flip heads twice in a row on a coin, an event that is not particularly shocking to anyone. However, many people chose to interpret Trump's 28.2% chance of winning as an absolute guarantee of a Trump losing. The interpretation shows a general disconnect between what election forecasting results mean and what audiences sometimes infer from these results. Forecast viewers should therefore remember that a model's results are expressed in probabilities and that they should take these probabilistic claims at face value instead of incorrectly assuming any sort of certainty.

4.3 Understanding of the Inherent Error Present in Election Polling

Similar to the way that audiences sometimes fail to recognize the probabilistic nature of forecasts, forecast viewers often underestimate the inherent error that exists in polls. As with all forms of statistical sampling, polls always include some margin of error. Historically, electoral polling margins of error are often between two and three percentage points, but these margins of error can be as much as ten percentage points (Mercer 2016). These margins are particularly important for models like FiveThirtyEight's Election Forecast because when polling results are aggregated, so are their margins of error. Thus, if every poll misses in the same direction, FiveThirtyEight's model would also expectedly miss its predictions (Bialik and Enten

2016).²¹ This means large and/or consistent polling errors leads to even larger errors in forecasting models. As a result, when evaluating any election forecast, including FiveThirtyEight's, the audience should always remember that most (if not all) of the error that occur in election forecasts come from the errors associated with polling data.

4.4 Emphasis on Uncertainty in Election Forecasts

The final and most important shortcoming of election forecast comes from the fact that, by definition, predictive models cannot be perfect. Though organizations like FiveThirtyEight do attempt to account for as many outside factors as possible, there will always be factors that remain intangible.²² These intangibles are nearly impossible to predict and quantify, which inherently makes the perfect forecast impossible. Nate Silver said, "The world is largely unknowable, so we just try to take what we can know and make the most of it" (Silver 2017). Because of the unknowable nature of the world, both forecasters and forecast readers should become more comfortable with the uncertainty that exists in our world and in our models, never assuming a model can anticipate the unexpected.

5.0 Conclusions

As our world continues to become more rich with data, we should expect to see an increasing number of people with predictive models who claim to have insights for many of the world's questions. Many (if not most) of these models will fail to accurately predict the future.

²¹ On November 4, FiveThirtyEight published an article speculating the apparent 3.3% polling gap between Clinton and Trump quite possibly could have been entirely due to polling error. This theory appears to be true.

²² As an example, on October 28, 2016, in a hearing before Congress, FBI Director James Comey reiterated some concerns about Clinton's use of a private e-mail server, a scandal that repeatedly hurt Clinton throughout the campaign. Comey's statements are largely considered to be a key factor in Clinton's electoral loss (Bialik and Enten 2016).

Some of these failures will be due to poorly constructed forecasts or poor understanding. Some models will fail even though they are well constructed and have made appropriate considerations. This failure is expected because inaccuracy is expected in the world of modeling. Given that good models can fail, in order to distinguish between the good and the bad, anyone interested in a forecast should make sure to understand the details of how that forecast determines its results. Predictive modeling is certainly not easy and as a result, many quality models will fail. This paper outlines how FiveThirtyEight's Election Forecast determined its results so that any interested party can understand the predictions made in the 2016 election and can recognize why its failure should not give any impression that forecasting is a foolish task.

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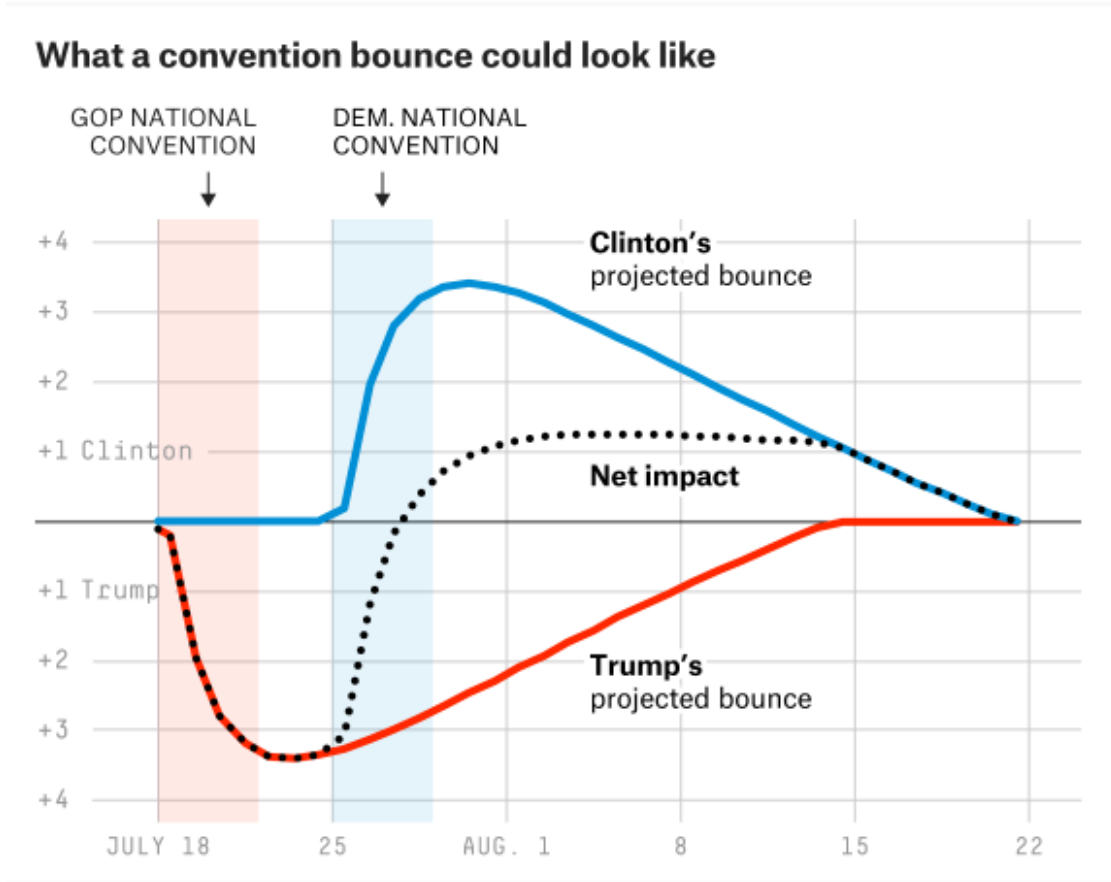
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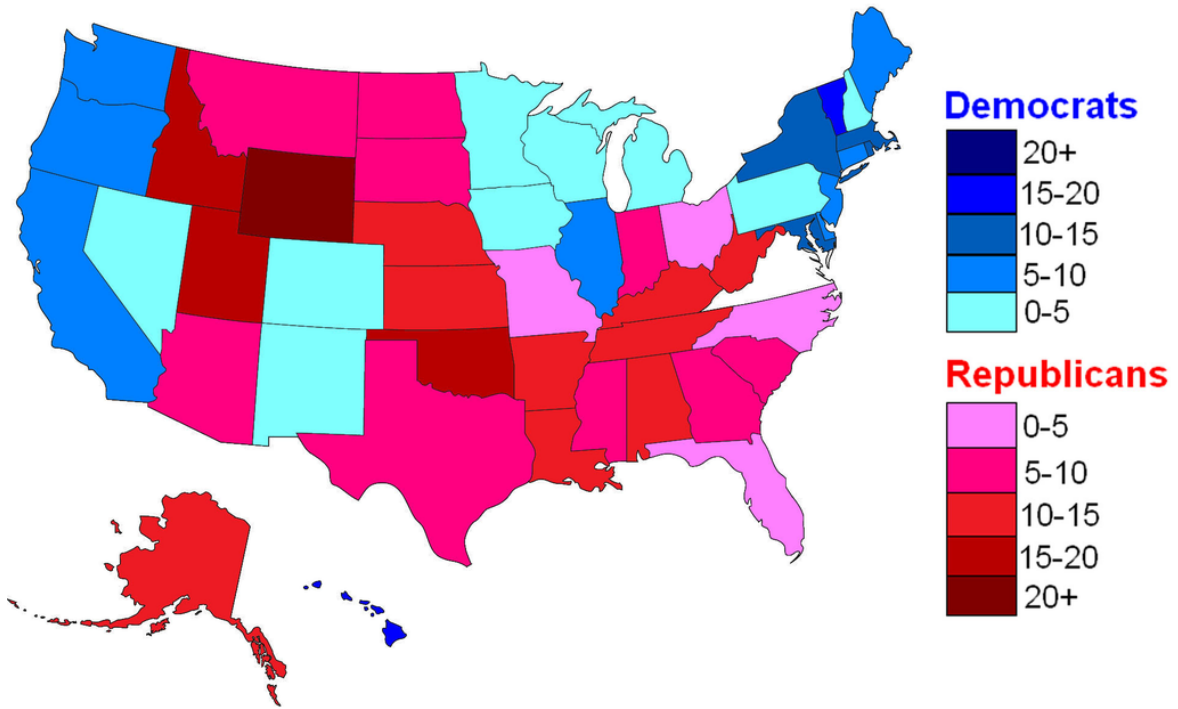
Figures

Figure 1 – Expected Net Impact from 2016 Convention Bounces



Silver, Nate. 2016b. "A User's Guide to FiveThirtyEight's 2016 General Election Forecast." Web log. FiveThirtyEight. ESPN. June 29. <https://fivethirtyeight.com/features/a-users-guide-to-fivethirtyeights-2016-general-election-forecast/>.

Figure 2 – Map of Partisan Voter Indices (PVI) by State from 2012 Election



“WikiVisually.com.” 2017. WikiVisually. Wikimedia. Accessed May 3.
http://wikivisually.com/wiki/Cook_Partisan_Voting_Index.

Figure 3 – Correlation Matrix of State Election Results

	Ala.	Calif.	Fla.	Minn.	N.C.	N.M.	R.I.	Wis.
Alabama		.60	.61	.53	.72	.54	.41	.55
California	.60		.73	.67	.69	.80	.61	.68
Florida	.61	.73		.67	.75	.70	.63	.76
Minnesota	.53	.67	.67		.68	.58	.64	.84
N. Carolina	.72	.69	.75	.68		.60	.53	.67
New Mexico	.54	.80	.70	.58	.60		.54	.64
Rhode Island	.41	.61	.63	.64	.53	.54		.69
Wisconsin	.55	.68	.76	.84	.67	.64	.69	

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