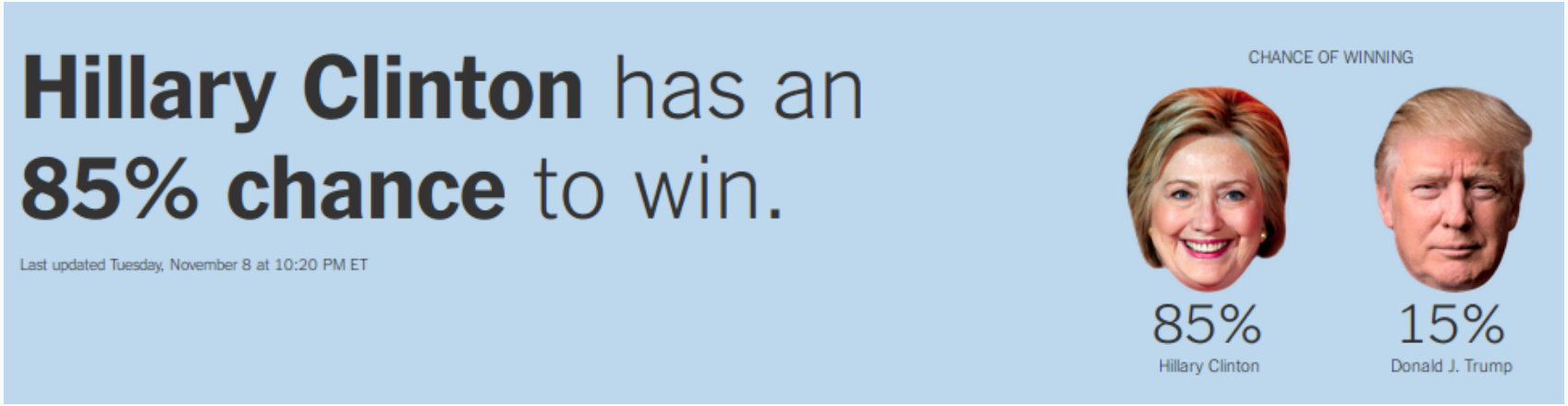
Econ 103: Statistics for Economists

Polls and Forecasting

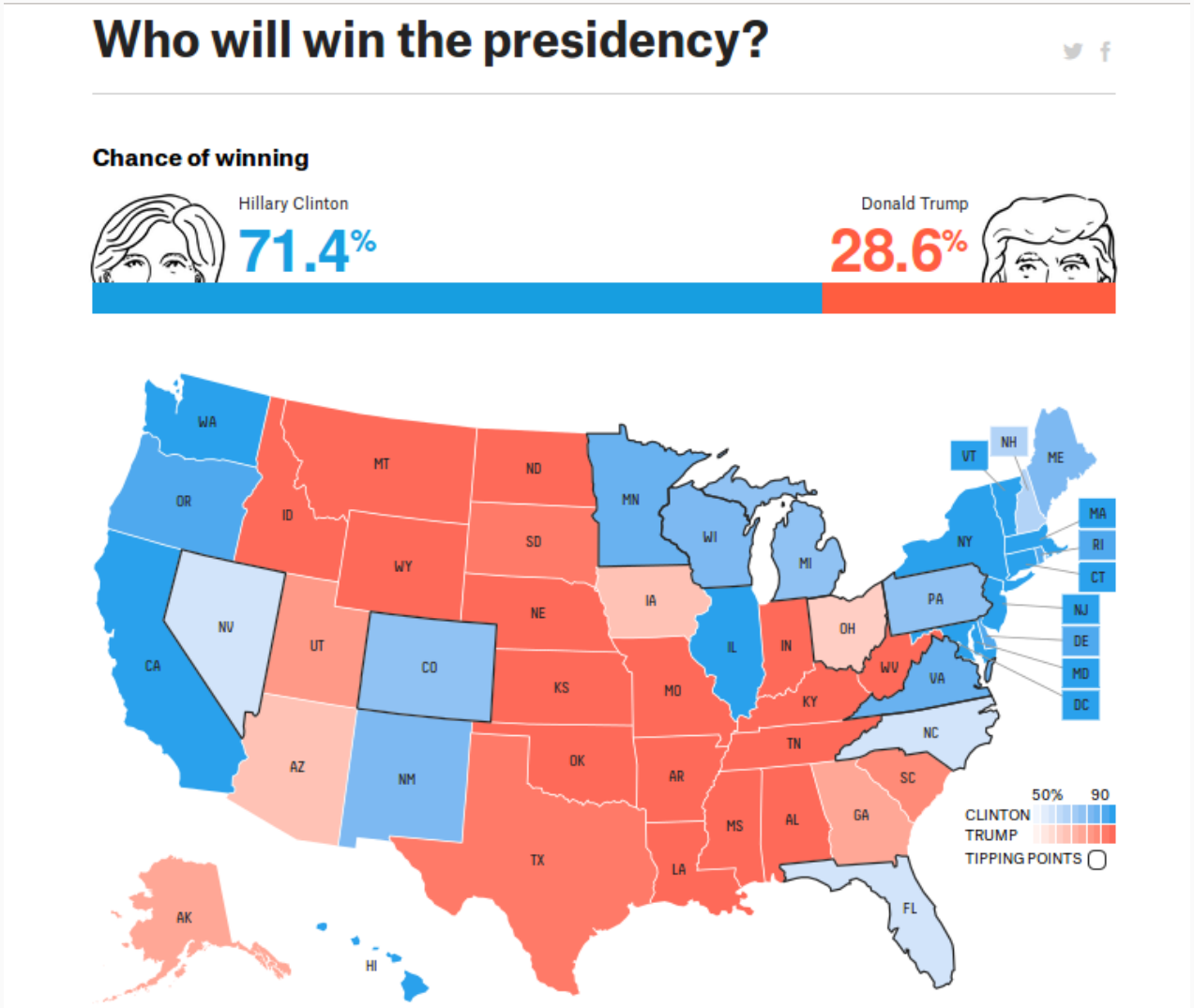
Mallick Hossain

In Case You Forgot



Source: New York Times

In Case You Forgot

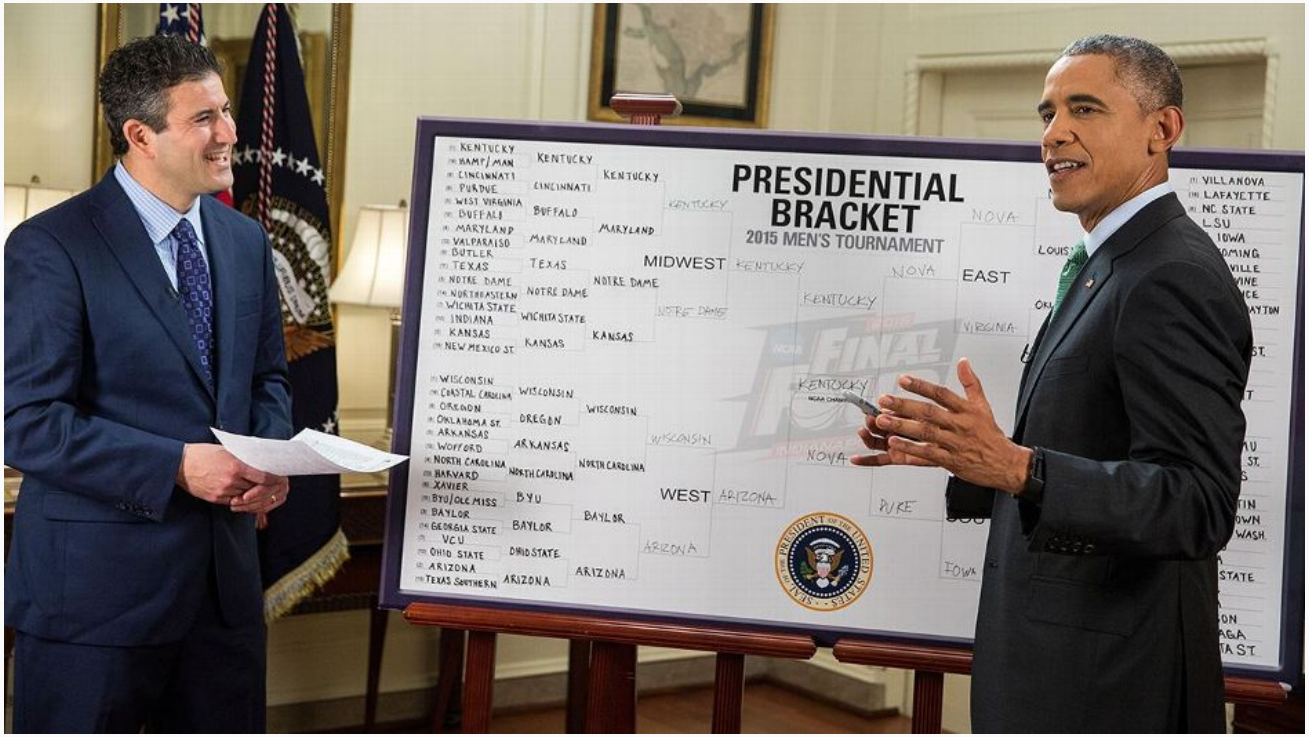


Source: FiveThirtyEight

Why is Forecasting Important?

Keeps Us Dry

Bragging Rights



Bragging Rights

Make Tons of Money

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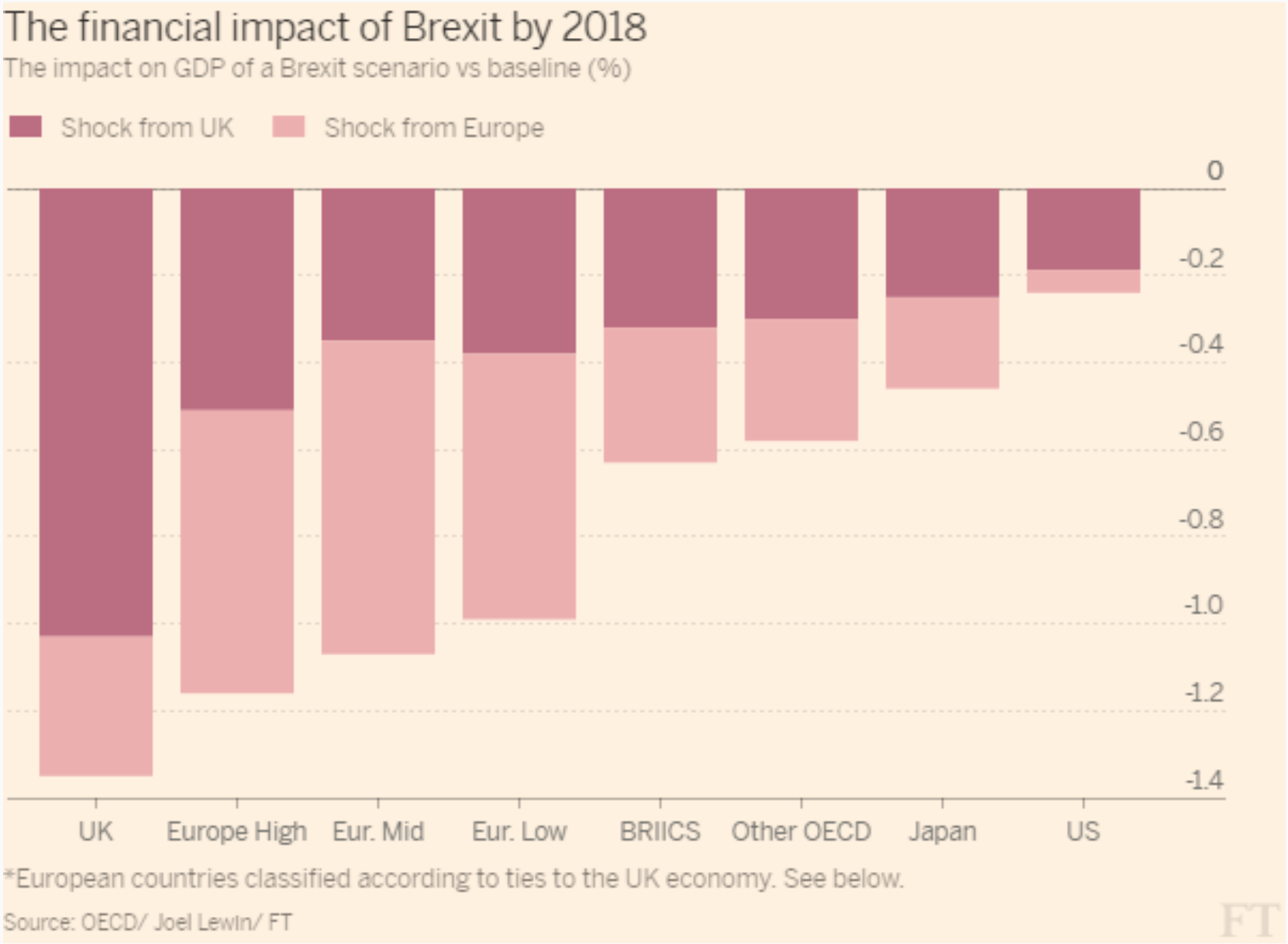
What Would Happen If?



How Does Polling Work?

Polling Basics

- At their core, polls and pollsters are responsible for conducting surveys and translating their sample results into predictions about the population.

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- Sound familiar?
- We will not discuss the details of survey design, but we will briefly discuss important questions that must be addressed when conducting any survey.

Conducting Surveys

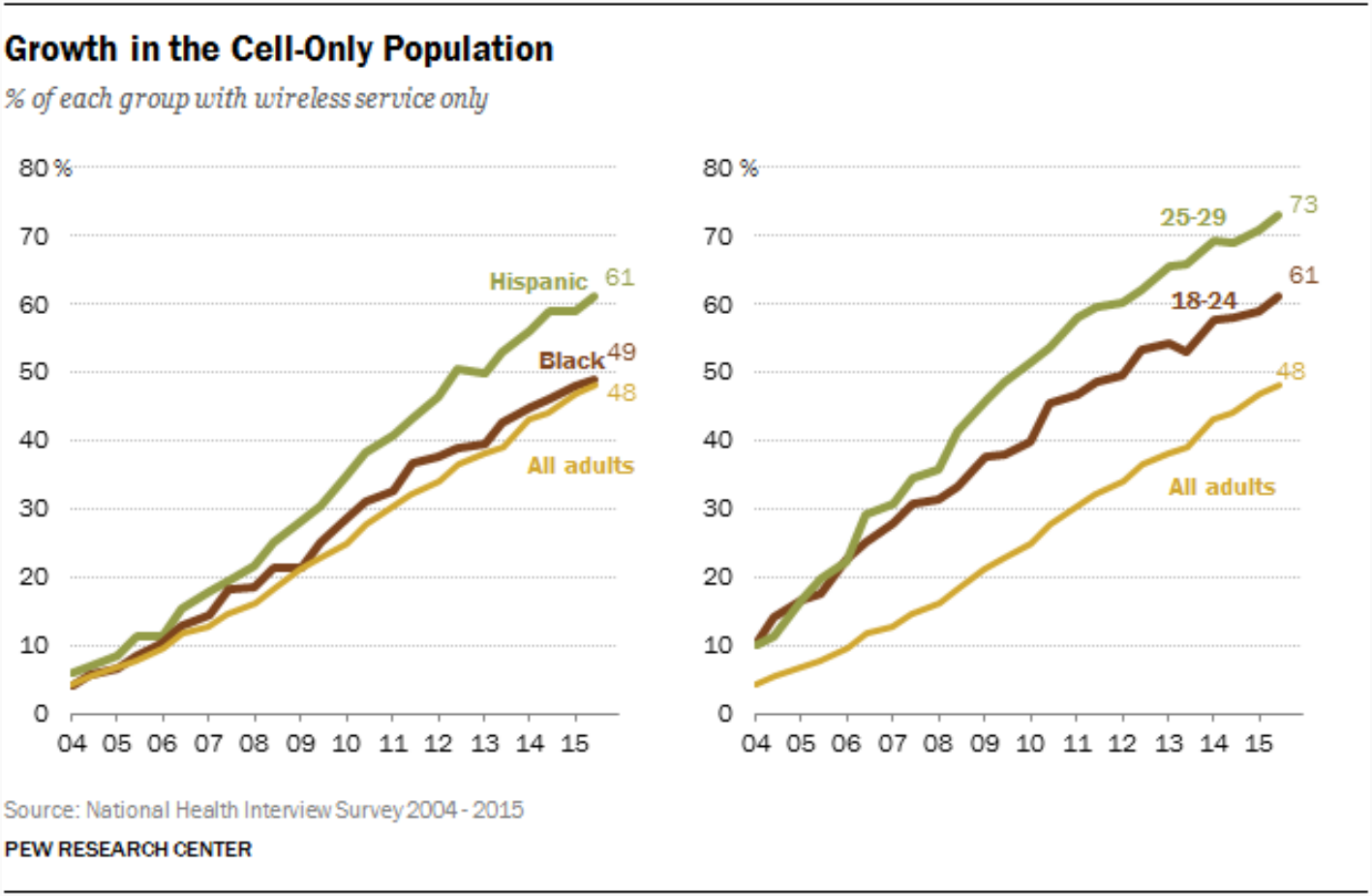
There are a lot of options when it comes to conducting surveys:

- Phone calls
- Online surveys
- In-person interviews
- Mail surveys

Phone Surveys

- Live or automatic phone calls?
- For landlines, do you survey the person picking up the phone or someone else in the household?
- Do you include cell phones?
  - People under 18 are usually not eligible for surveys so screening out ineligible respondents increases survey costs
  - Determining geography from cell phone number is hard
- Call or text?
- Should we be worried about the ~3% of people without phones?

Cell Phone Use

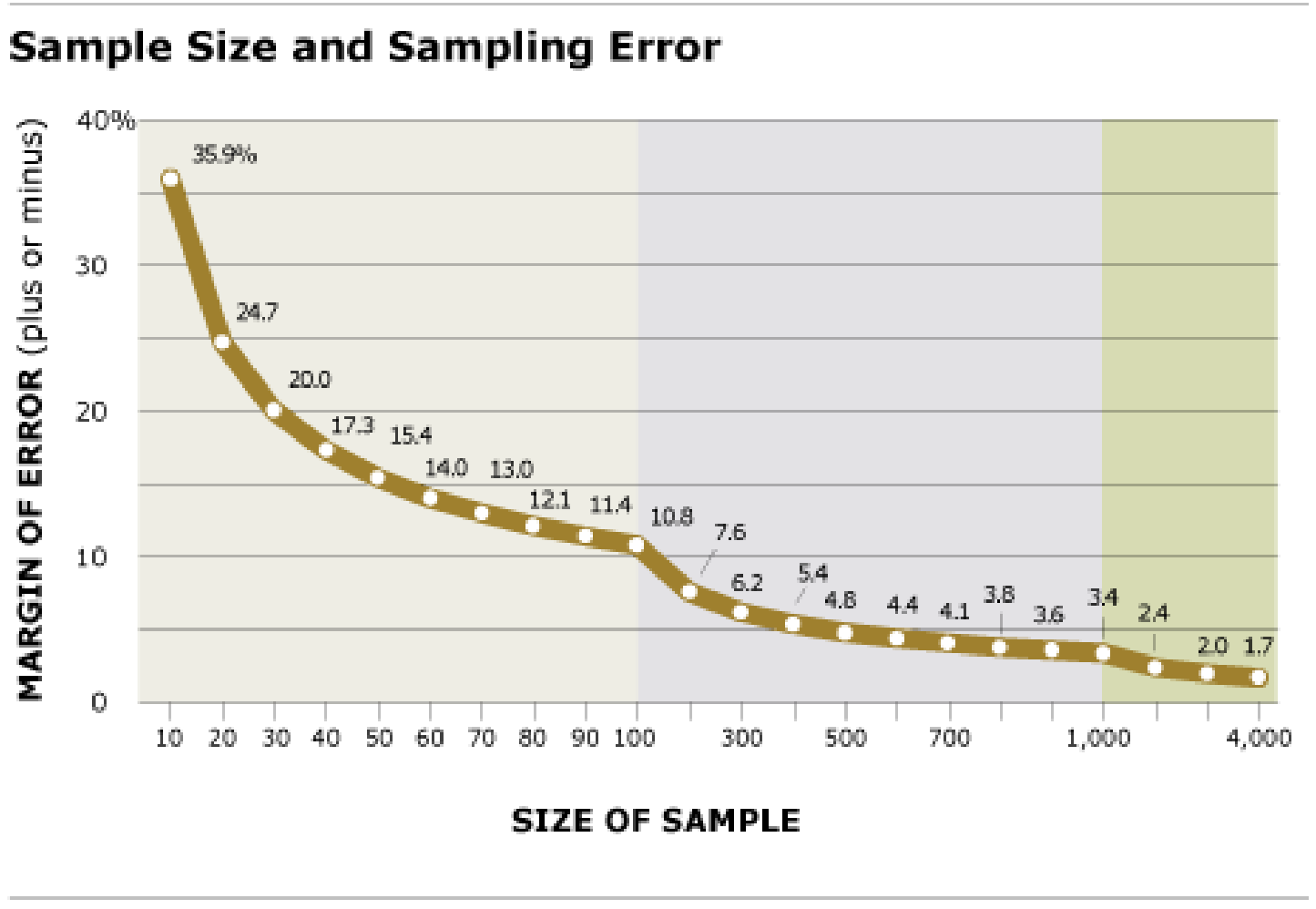


- **Meta-point:** Survey design is changing due to survey results.

Picking a Sample

- How big should your sample be?
- Should you pick a random sample and just tally what you get?
- Should you have a desired sample and survey until you get that sample?
- Who should you survey? Everyone? Eligible voters? Likely voters?
    - How do you figure out which group people belong to?

Sampling Error and Sample Size



Source: Pew Research

Adjusting the Results

- How do you deal with non-response or refusals?
  - For context, response rates are about 5% - 15%.
  - Response rates have been declining over time. Should we be worried?
- How do you account for people lying?
  - Social desirability bias
- How do you properly weight your results?
  - Generally, pollsters use Census demographics to construct their weights.

Detour/PSA: Concerns About National Statistics and Their Perception

National Statistics

"What gets measured gets managed"

- Reliable national statistics are the mark of a well-developed country

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    - What you've learned in this course enables you to check their methods
    - If there are shortcomings in their methods, let them know because they want to improve their data quality

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- There is a debate to be had about national statistics, but the current tone of debate is an all-out disregard for them
- Outright disregard is dangerous

Cases in Point

"People in this country have had enough of experts"

Cases in Point

"5.3 percent unemployment – that is the biggest joke there is in this country. ... The unemployment rate is probably 20 percent, but I will tell you, you have some great economists that will tell you it's a 30, 32. And the highest I've heard so far is 42 percent."

Why is This Concerning?

- There seems to be a movement to undo all of our statistical progress.

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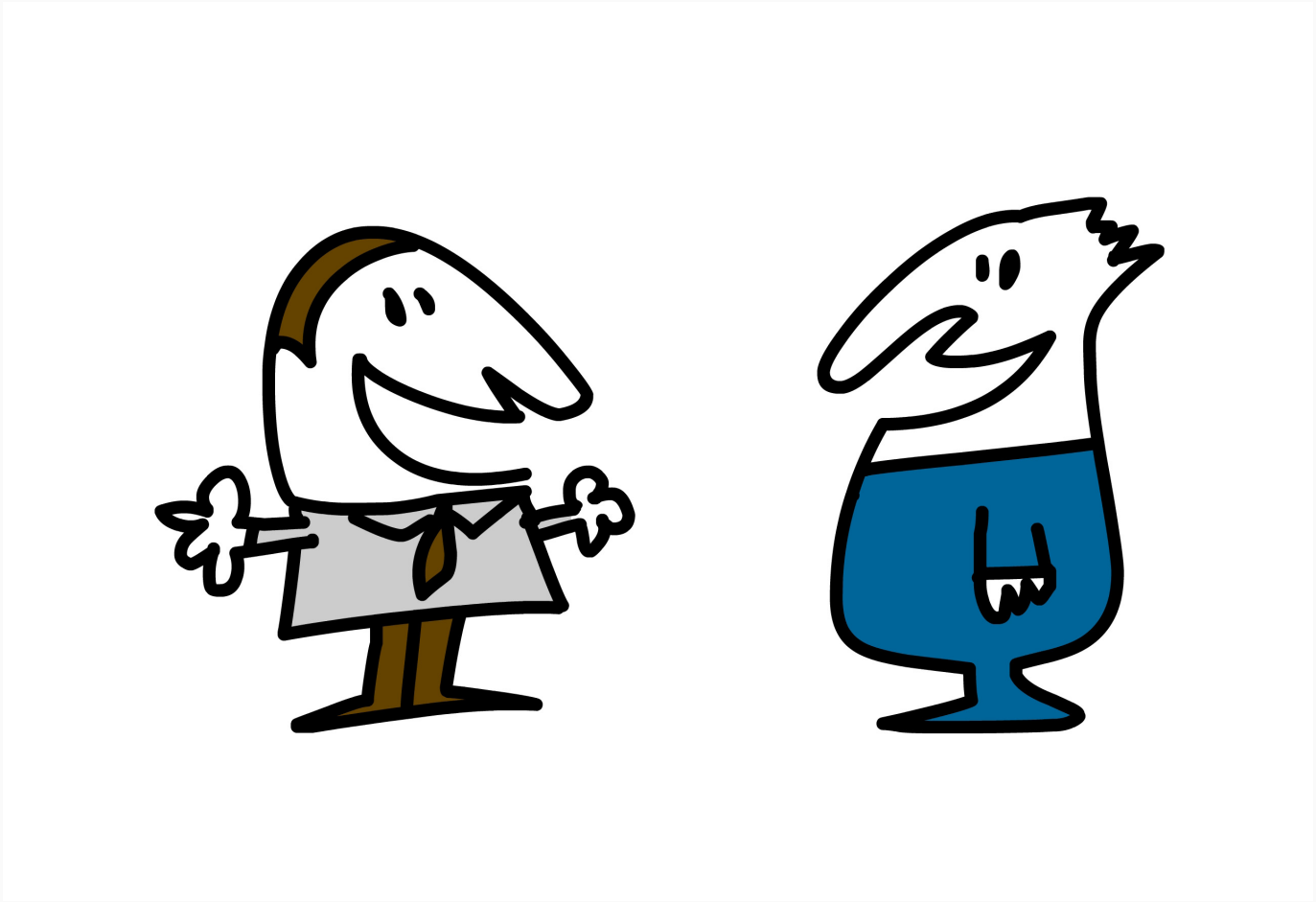
- It's important to convince everyone of the value of statistics
- Maybe a story would help

Curiosity: How a Statistic is Made (A Made-Up History)

It Starts with a Question

"I wonder what the national unemployment rate is."

Ask the Question



"Do you have a job?"

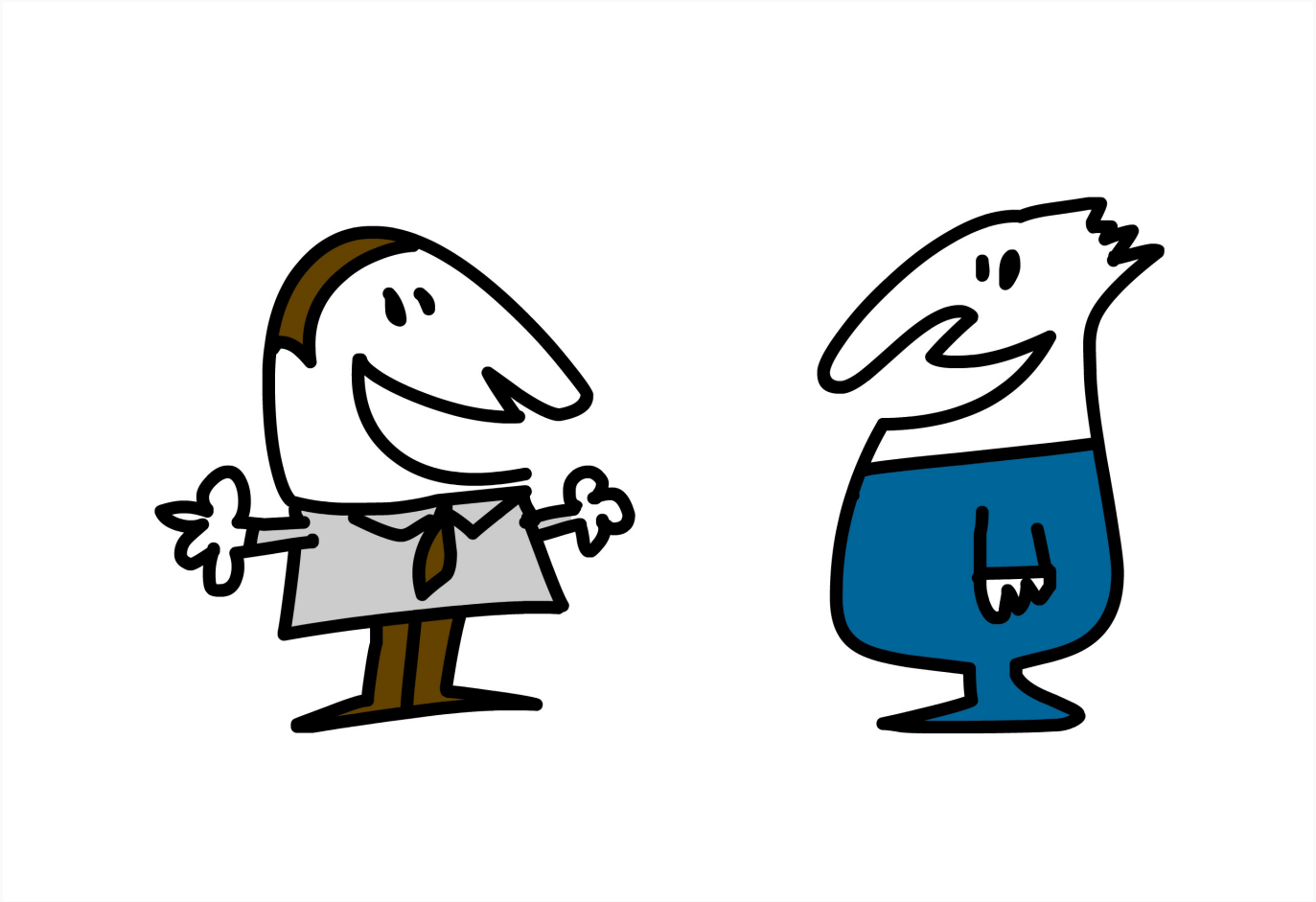
Gather Results

"Fifty percent of my friends do not have a job"

Question Results

"This doesn't seem right. Maybe I should ask more people since I only asked 2 of my friends."

Ask More People



"Do you have a job?"

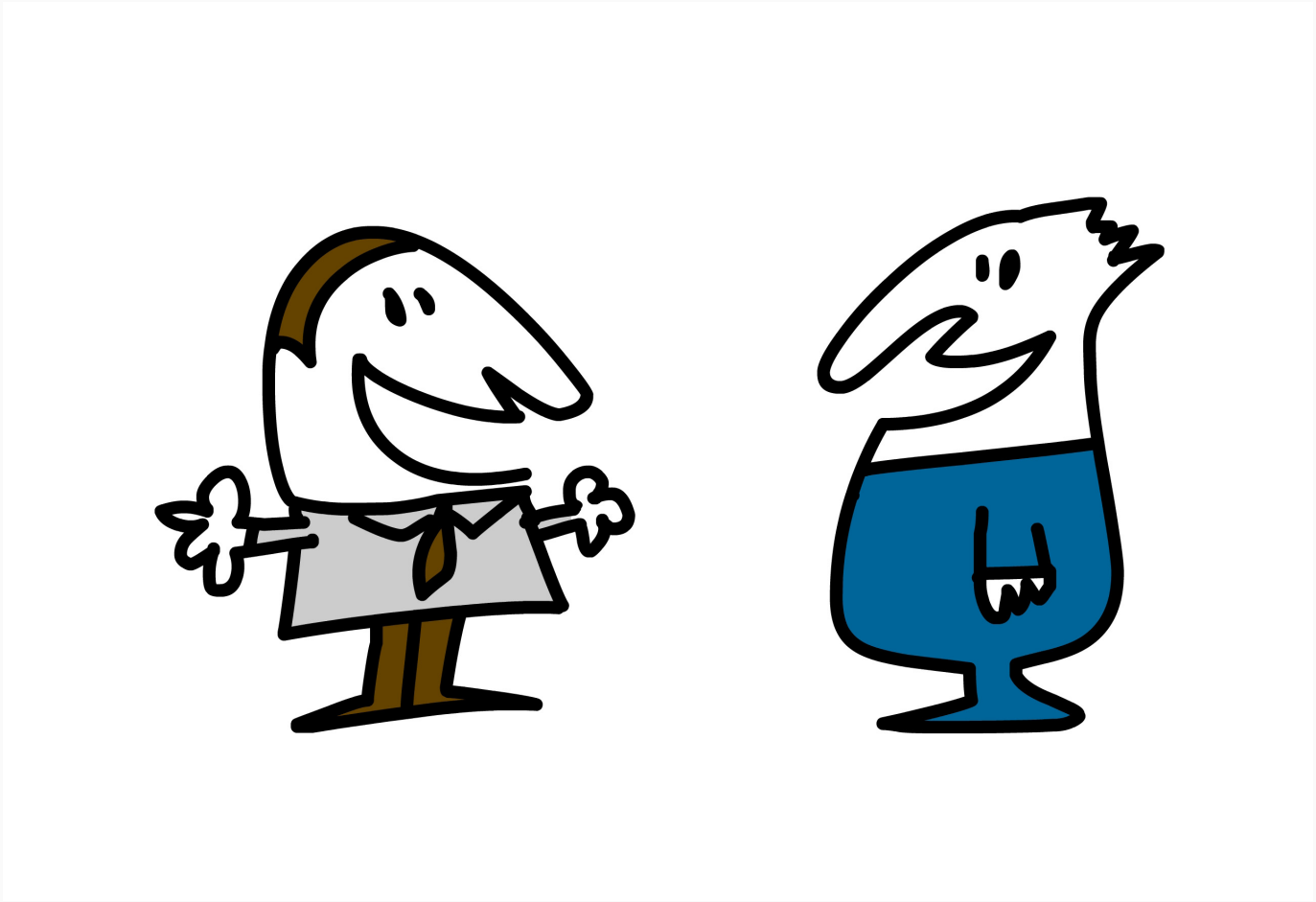
Gather Results

"Twenty percent of my friends do not have a job"

Question Results

"This doesn't seem right. Maybe I should ask people in other parts of town since I only asked people in my neighborhood and one of the stores just closed."

Ask More People



"Do you have a job?"

Gather Results

"Fifteen percent of the people I talked to do not have a job"

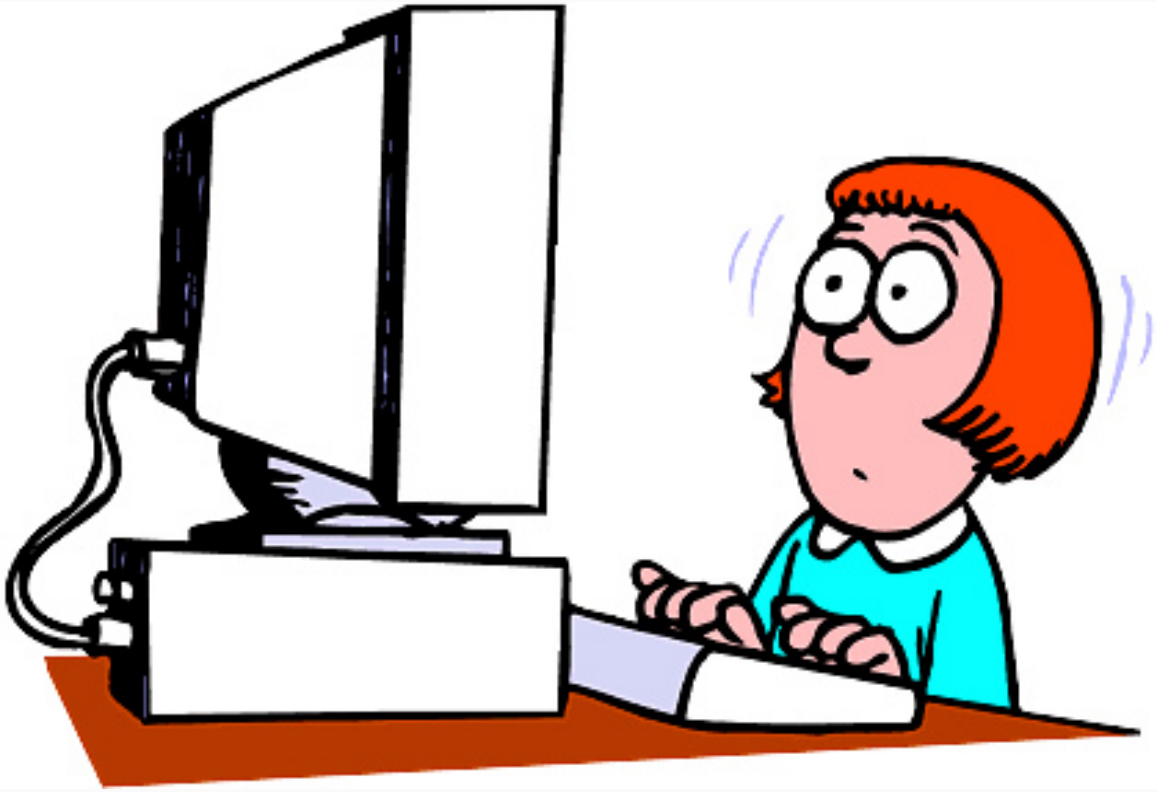
Question Results

"Is my number a good estimate of the national unemployment rate? Probably."

Publish Results

"I'm gonna tell everyone the national unemployment rate!"

Respond to Comments



"My friend commented that he thinks my number is wrong. None of his friends are unemployed. He's in California, so maybe I should talk to people in California and see what their job prospects are."

Repeat

- Repeat

Repeat

- Repeat
- Repeat

Repeat

- Repeat
- Repeat
- Repeat

Repeat

- Repeat
- Repeat
- Repeat
- Repeat until you get a representative sample.

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- Repeat
- Repeat
- Repeat
- Repeat until you get a representative sample.
- Or just skip most of these initial steps and start with a nationally representative sample

And So a Statistic Was Born!

And Statistics Lived Happily Ever After

And Now We're Here

"Yeah, I don't believe that number either. Two of my friends don't have a job, so the unemployment rate has got to be higher than that. The rest of my friends are emus, so they don't count."

What's Next?

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- Now that you've learned the magic of statistics
  - It's really not that crazy, is it?
- It's up to all of us to help others understand that statistics is a tool
- If we do not believe a number, let's figure out the assumption we do not like, let's not throw out the whole statistic (or all of statistics)

Back on Track: Thinking About Forecasting

Point Estimates

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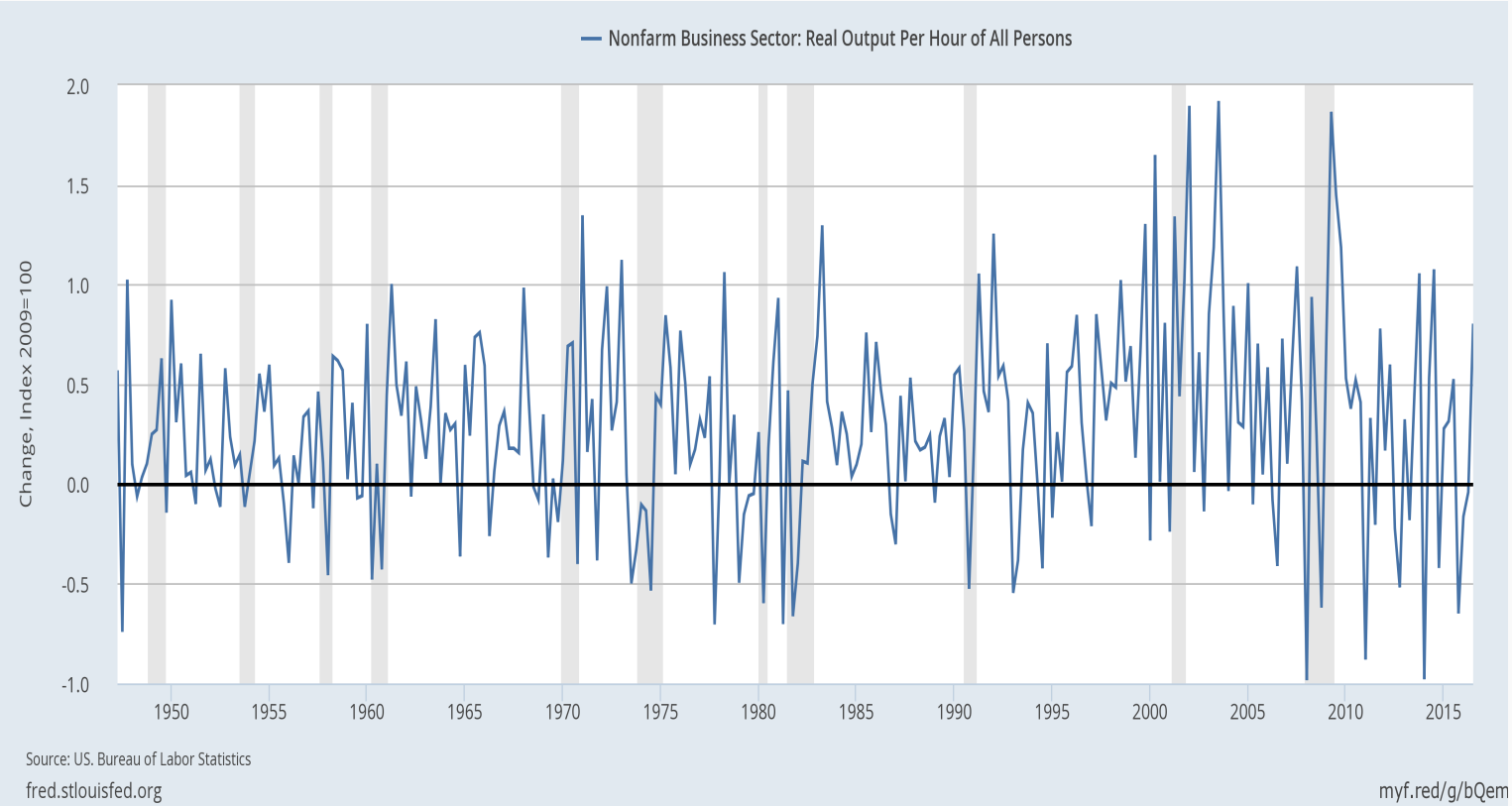
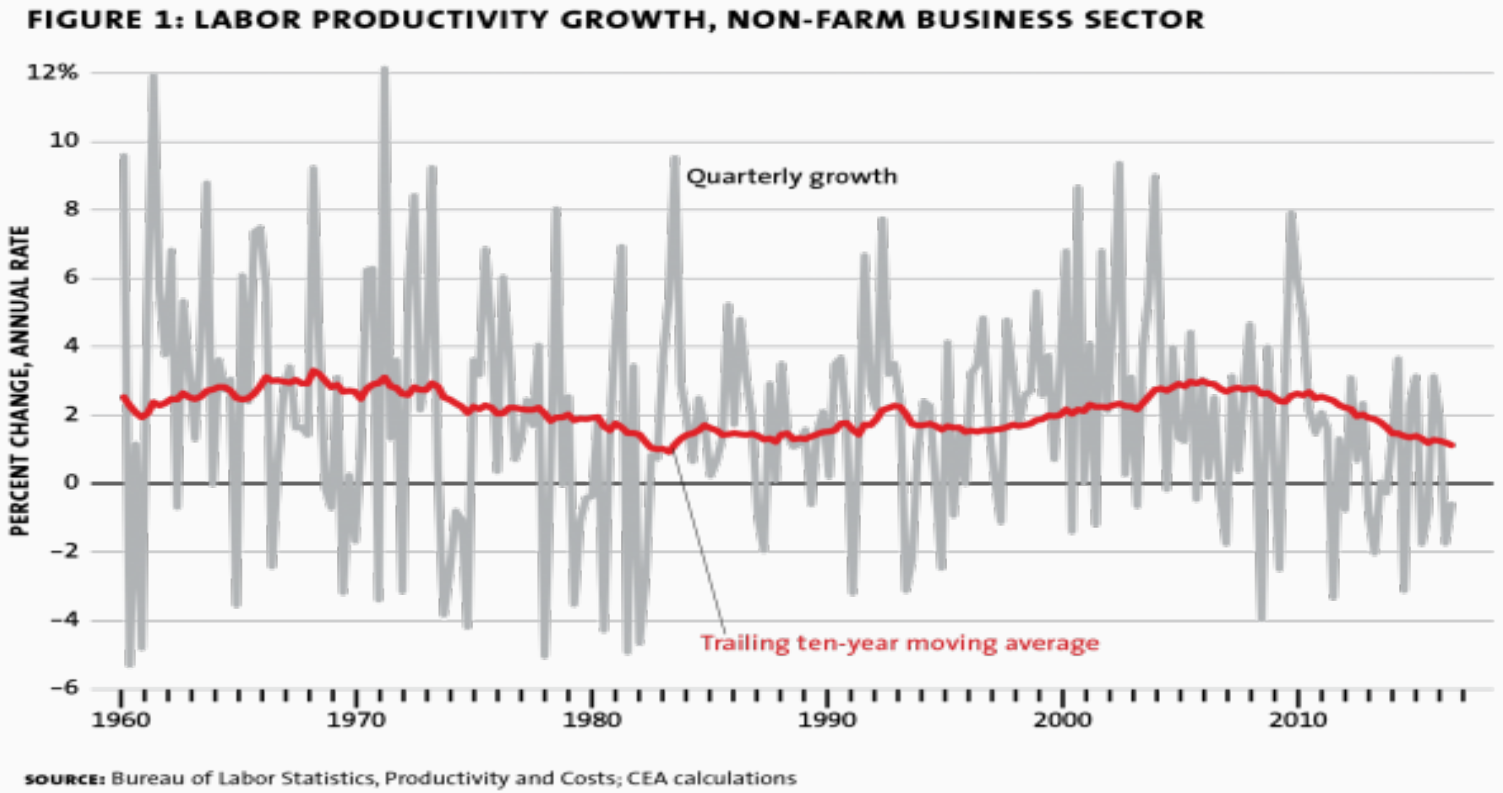
  - Trump/Clinton will win the election
  - GDP growth will be 1.8% in 2016:Q4
  - Unemployment will be 5% in December 2016
- Why are these not particularly informative?
- What statistical concept have we discussed would be more informative?

Creating a Forecast



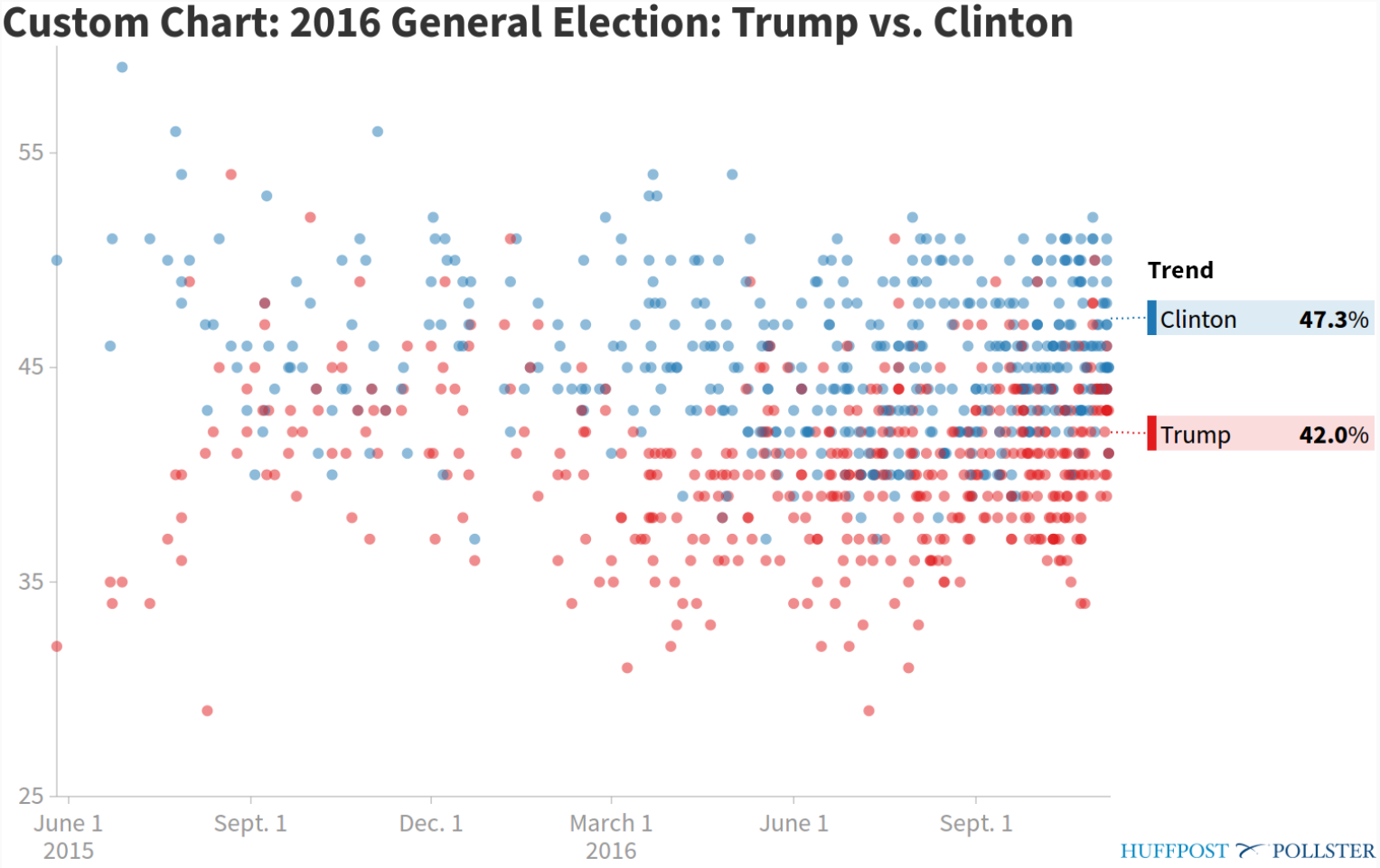
What is your forecast of the change in productivity next quarter?

Smoothing Out the Noise



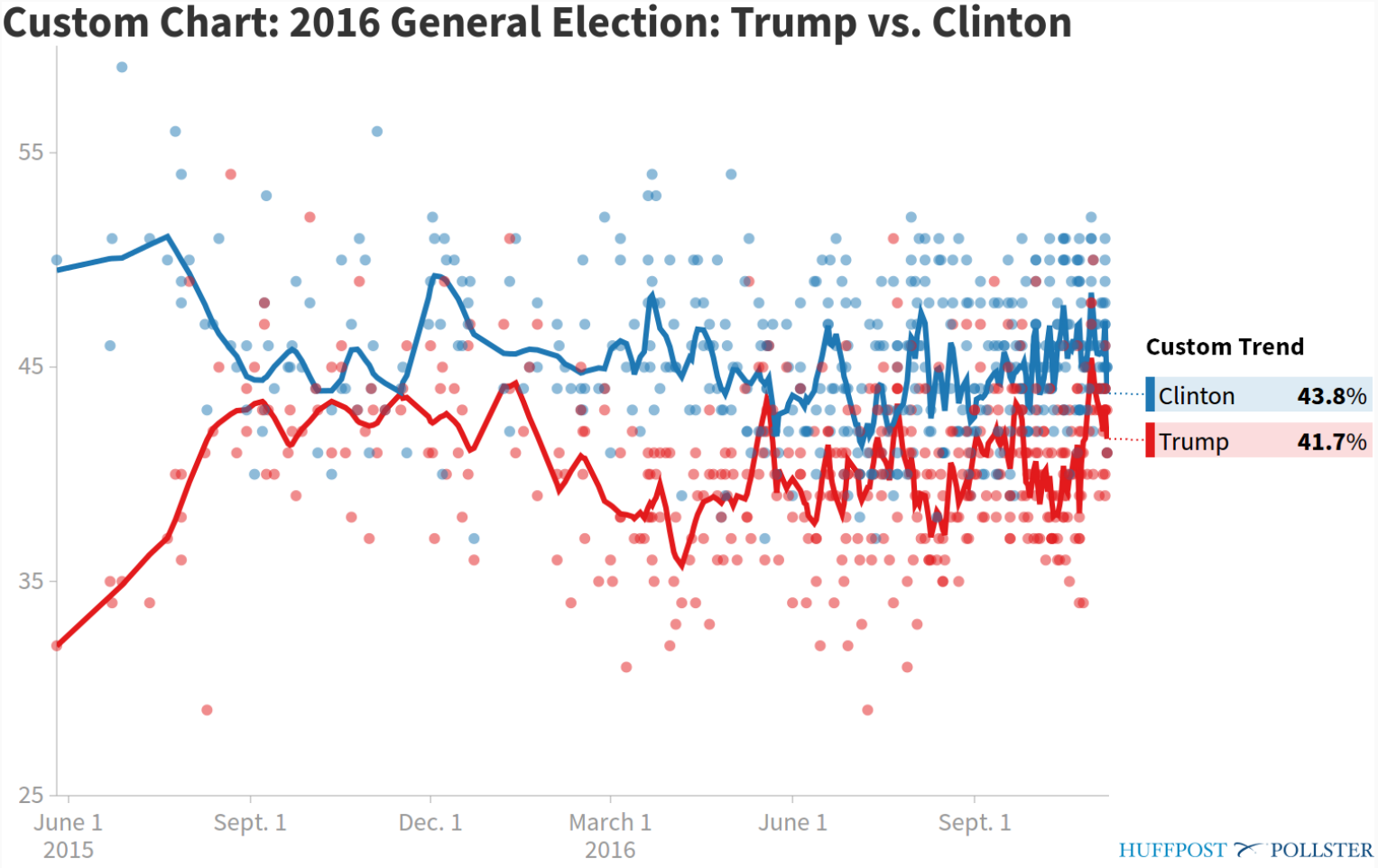
Now it might be easier to make a forecast? How confident are you that your estimate will be right?

Let's Look at Election Polls!



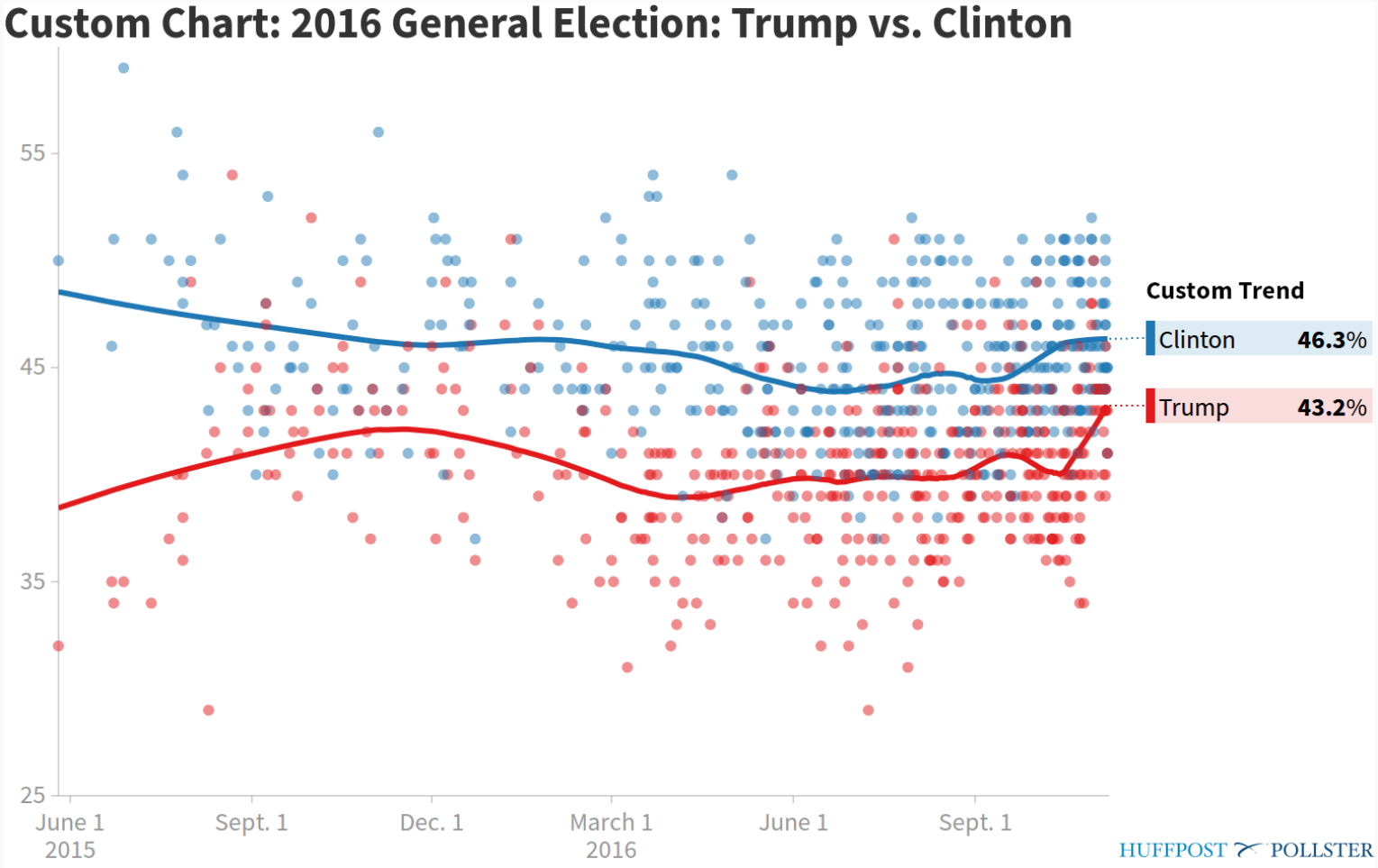
Uh oh... This is gonna be hard.

Smooth Them Out?



If we don't smooth too much, this still looks difficult.

More Smoothing!



This makes it easier to make a forecast. Do we believe it though? Too much smoothing could be covering up some meaningful shifts in polls.

Difficult Decisions

Difficult Decisions

Poll Rating

How to Rate Polls

Note: I am primarily outlining FiveThirtyEight's methodology since they're probably the most popular poll aggregator and forecaster. If you have questions about other forecasters, just let me know!

- We know that all of these polls are wrong in some way

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  - We want a system that gives more accurate polls more weight

What Do Polls Look Like?

Let's look at FiveThirtyEight's database of polls! `https://github.com/fivethirtyeight/data/tree/master/pollster-ratings`

Pollster Ratings

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  - Bonus question: What assumption does herding violate?

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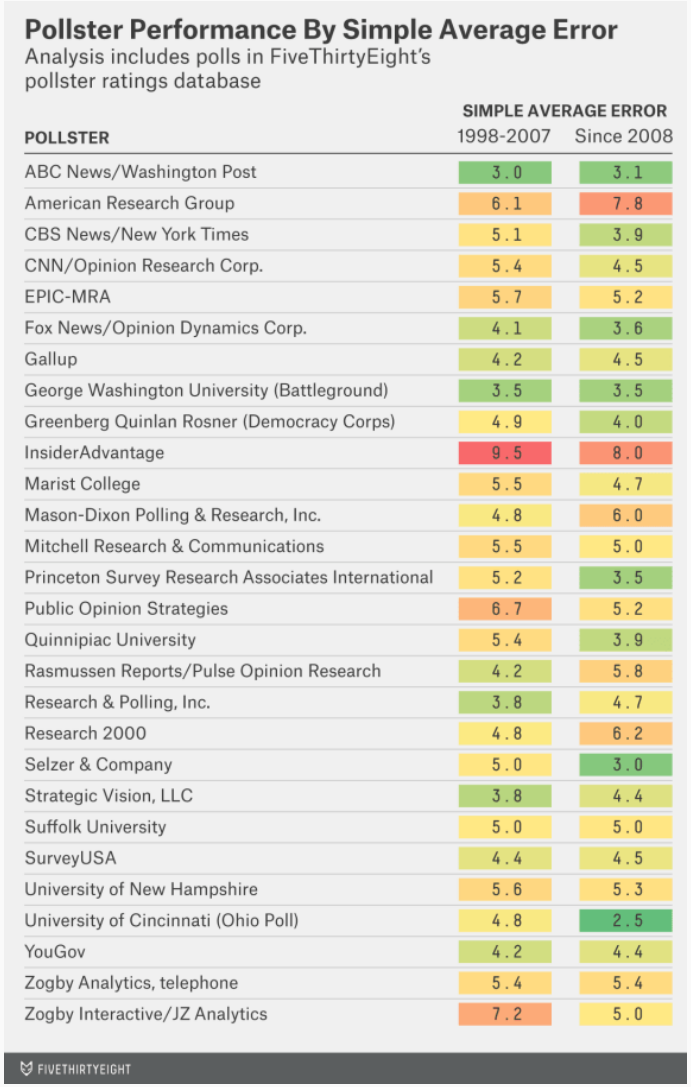
  - If my goal was to be the top pollster, I would just poll for easy elections.
  - We want to figure out which pollsters are actually good instead of which ones are just good at picking easy elections.

Comparing Pollsters



Pollster Performance By Simple Average Error

Analysis includes polls in FiveThirtyEight's pollster ratings database

POLLSTER	SIMPLE AVERAGE ERROR 1998-2007	Since 2008
ABC News/Washington Post	3.0	3.1
American Research Group	6.1	7.8
CBS News/New York Times	5.1	3.9
CNN/Opinion Research Corp.	5.4	4.5
EPIC-MRA	5.7	5.2
Fox News/Opinion Dynamics Corp.	4.1	3.6
Gallup	4.2	4.5
George Washington University (Battleground)	3.5	3.5
Greenberg Quinlan Rosner (Democracy Corps)	4.9	4.0
InsiderAdvantage	9.5	8.0
Marist College	5.5	4.7
Mason-Dixon Polling & Research, Inc.	4.8	6.0
Mitchell Research & Communications	5.5	5.0
Princeton Survey Research Associates International	5.2	3.5
Public Opinion Strategies	6.7	5.2
Quinnipiac University	5.4	3.9
Rasmussen Reports/Pulse Opinion Research	4.2	5.8
Research & Polling, Inc.	3.8	4.7
Research 2000	4.8	6.2
Selzer & Company	5.0	3.0
Strategic Vision, LLC	3.8	4.4
Suffolk University	5.0	5.0
SurveyUSA	4.4	4.5
University of New Hampshire	5.6	5.3
University of Cincinnati (Ohio Poll)	4.8	2.5
YouGov	4.2	4.4
Zogby Analytics, telephone	5.4	5.4
Zogby Interactive/JZ Analytics	7.2	5.0

FIVETHIRTYEIGHT

Step 2: Computing Simple Plus-Minus (Incorporating Different Factors)

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  - Pick well-covered elections and just mirror the results of other good pollsters. Maybe make your sample size really small so it looks like you're doing even better than you should!
  - We have to try and break rewarding herding behavior so that good pollsters can really shine

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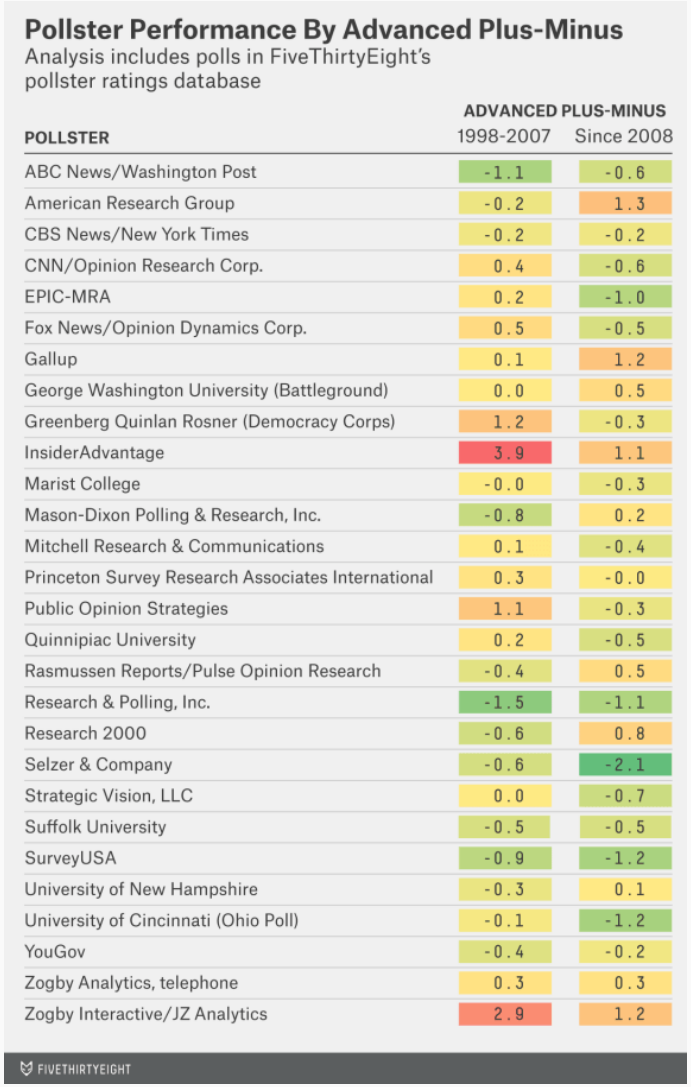
  - If there are a lot of pollsters predicting an election, we do not want to reward them too much for being right for similar reasons as above.
  - Pollster ratings are like sports rankings. You account for both the win record as well as the "strength" of the schedule.

Comparing Pollsters



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American Research Group	-0.2	1.3
CBS News/New York Times	-0.2	-0.2
CNN/Opinion Research Corp.	0.4	-0.6
EPIC-MRA	0.2	-1.0
Fox News/Opinion Dynamics Corp.	0.5	-0.5
Gallup	0.1	1.2
George Washington University (Battleground)	0.0	0.5
Greenberg Quinlan Rosner (Democracy Corps)	1.2	-0.3
InsiderAdvantage	3.9	1.1
Marist College	-0.0	-0.3
Mason-Dixon Polling & Research, Inc.	-0.8	0.2
Mitchell Research & Communications	0.1	-0.4
Princeton Survey Research Associates International	0.3	-0.0
Public Opinion Strategies	1.1	-0.3
Quinnipiac University	0.2	-0.5
Rasmussen Reports/Pulse Opinion Research	-0.4	0.5
Research & Polling, Inc.	-1.5	-1.1
Research 2000	-0.6	0.8
Selzer & Company	-0.6	-2.1
Strategic Vision, LLC	0.0	-0.7
Suffolk University	-0.5	-0.5
SurveyUSA	-0.9	-1.2
University of New Hampshire	-0.3	0.1
University of Cincinnati (Ohio Poll)	-0.1	-1.2
YouGov	-0.4	-0.2
Zogby Analytics, telephone	0.3	0.3
Zogby Interactive/JZ Analytics	2.9	1.2

FIVETHIRTYEIGHT

Step 4: Refining to Predictive Measures

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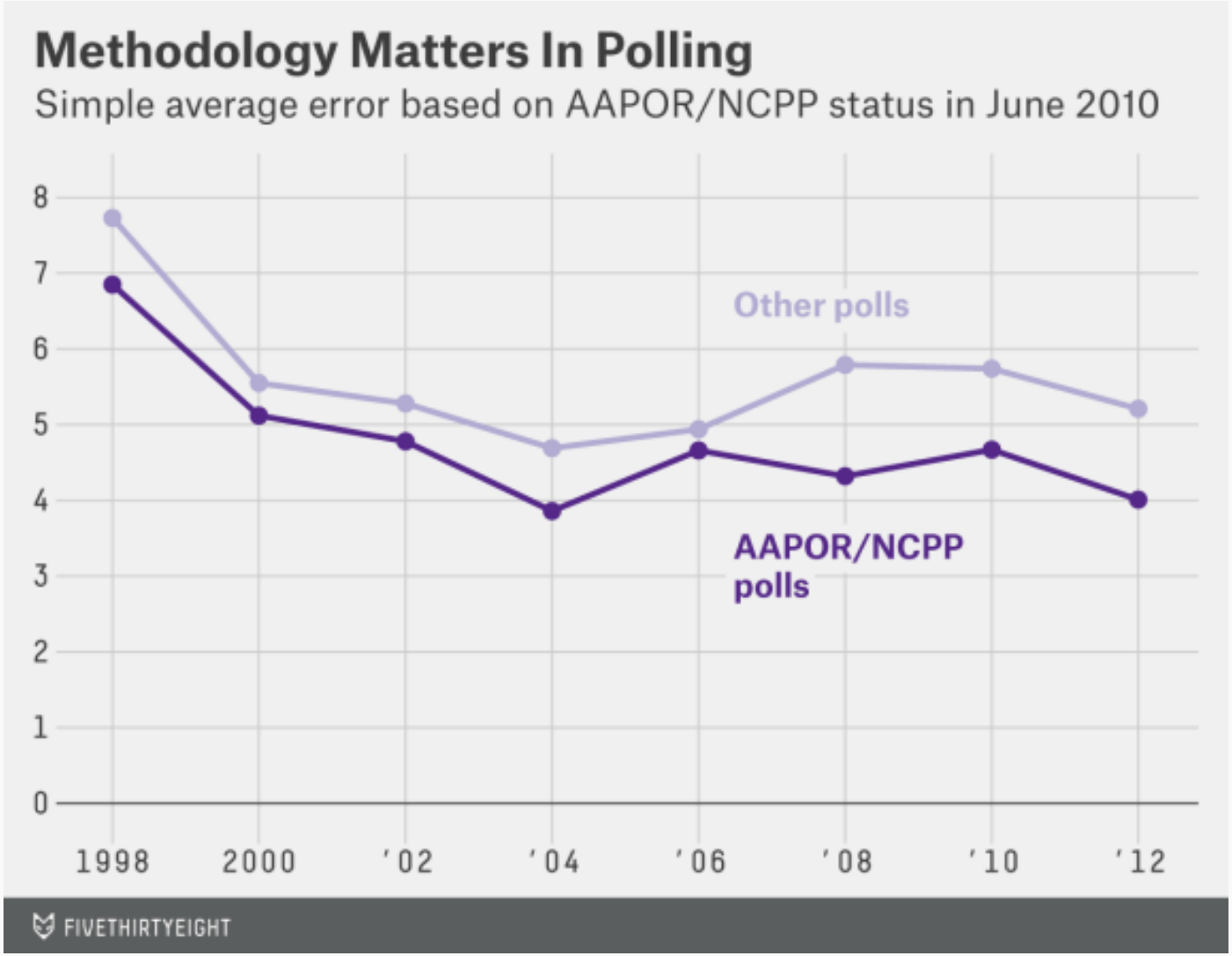
    - Being a member of the National Council of Public Polls or supporting the American Association for Public Opinion Research Transparency Initiative are both good indicators that a pollster adheres to rigorous polling standards.

Comparing Pollsters



Note: 2010 and 2012 are out-of-sample tests

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Poll Aggregation and Election Forecasting

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  - House effects (account for statistical biases of various pollsters)

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  - Error distributions are assumed to have fat tails, so they are drawn from a t-distribution! Some of this is also motivated because these forecasts are based on 11 past elections, so we're not exactly in large sample territory just yet.

What Happened?

The Question

- The overarching question since the election has been did Trump beat the odds or were the odds wrong all along?
- It is difficult to separate the two.

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  - So if it wasn't sampling error, what was it?

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  - Dealing with undecided voters is a judgement call

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- There's plenty of room for improvement. Just because Nate Silver is the best-known statistician does not mean he is the best statistician.
    - I assume there's some Nate Gold/Platinum/Diamond out there waiting to make his/her name! Maybe someone in this class!

Notable 538 Assumptions

- 538 only computes the error based on the difference between the top 2 finishers. Would taking a more comprehensive account of errors if there are more than 2 finishers give a better result?
- 538 only includes polls that are conducted within 21 days of the election. Is there information to be obtained from using earlier polls? Is there a more nuanced cut-off date we could apply?
- 538 bans certain pollsters that it believes have "faked some polling results or engaged in other gross ethical misbehavior." Would having stricter rules improve forecasts (e.g. removing demonstrated "herders")?

Startup Idea

It is indeed problematic, and even a little dangerous, for any one site like FiveThirtyEight to have that much influence over the market. . . It's the "fault" of a marketplace that has failed to develop alternatives to our ratings, in spite of the barriers to entry being relatively low. . . But this hasn't happened, for reasons I don't fully understand. I think part of it is that the overlap of skills and interests required to motivate something like a set of pollster ratings occurs relatively rarely outside of academia, and the culture of the Academy is very conservative in many ways. And outside of academia, deigning to rate anything from restaurants to baseball players usually results in a lot of people being fed up at you; it's not the best way to make friends. ***The Pollster Ratings are a product of which I'm immensely proud, but it would be better if they had some competition.*** *–Nate Silver (June 20, 2010)*

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- You've been preparing for this moment your whole life!
    - Well, most of the preparation was this semester. . . but you're whole life has led up to this point!

Go Fly!

Sources

- The State of the Polls, 2016
- The Polls Missed Trump. We Asked Pollsters Why
- Presidential Forecast Post-Mortem
- Pollster Ratings v4.0: Methodology
- How the FiveThirtyEight Senate Forecast Model Works
- How FiveThirtyEight Calculates Pollster Ratings
- Here's Proof Some Pollsters Are Putting A Thumb On The Scale
- A User's Guide To FiveThirtyEight's 2016 General Election Forecast
- Why FiveThirtyEight Gave Trump A Better Chance Than Almost Anyone Else
- Explanations for that shocking 2% shift