GROUP 7

TO VOTE OR NOT TO VOTE: Does uncertainty in public opinion affect political engagement in US Presidential elections?

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Abstract

In the context of an indeterminate global political climate, with trust in democracy waning, analysing society's view of and participation in democratic processes is imperative. This paper aims to investigate, with an emphasis on the 2016 US presidential elections, the effect of uncertainty in public opinion on political engagement. This paper deploys fluctuations in opinion polls across US states as a proxy for uncertain public opinion, whilst the gauge for political engagement is voter turnout in each state. Fluctuations in opinion polls and voter turnout have seldom been linked in existing literature. Having conducted a regression to uncover a potential relationship, the findings indicate that there is a weak negative correlation between fluctuations in opinion polls and voter turnout. This result is subsequently analysed under a theoretical framework of social choice, and we argue that greater fluctuation in opinion polls tends to lower perceived social utility acquired from voting, thus decreasing voter turnout.

Key words: political engagement, public opinion, opinion polls, voter turnout, fluctuations, uncertainty, proxy, democracy, US presidential elections

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Introduction

Globally, the past decade has been one of seismic political shifts. Replete with unconventional political theatre, post-truth campaigning, and electoral surprises, it is almost undeniable that "democracy is going through a difficult time" (The Economist, 2014). Such an indeterminate political climate, and widespread disillusionment with democracy, particularly in the West, makes analysing society's view of and participation in democratic processes vital.

This paper's focus, therefore, is on voter behaviour in the context of uncertainty. Two strands of voter behaviour are predominant: voter preferences (opinion) and voter participation (engagement). This paper's distinct aim is to examine a potential relationship between uncertainty in public opinion and political engagement in US presidential elections. Using fluctuations in opinion polls across US states as a proxy for uncertainty in public opinion (hitherto underexplored in existing literature), and voter turnout as a measure of political engagement, we conduct a regression in order to uncover a correlation. Subsequently, we use the rational choice theory and social choice theory to interpret the results, in terms of the effect of fluctuations in opinion polls on perceived social utility gained from voting and hence voter turnout.

Literature review

Analysis of factors motivating individuals to turn out to vote has received considerable coverage in existing literature. For instance, a number of game theoretic approaches have been adopted; Großer and Schram (2006) focus on social embeddedness in their experiment, proposing that voters' participation is contingent upon information they receive regarding others' voting decisions. Demichelis and Dhillon (2010), moreover, examine complete and incomplete information games, and so can be said to characterise uncertainty as the absence of information regarding other voters' preferences. Großer and Schram (2010) go on to emphasise, having conducted an experimental study (participation game), that voter turnout rates actually increase when opinion polls (revealing level of support for candidates) are released. Matsusaka (1995) concludes that voters who are utility-maximizing obtain higher payoffs the higher their confidence in their voting preference; again, the focus is on information exposure effects. Likewise, Vannette and Westwood (under review) examine whether the release of opinion polling information potentially has a positive, mobilizing effect on voter turnout.

This paper's dissection of the relationship between opinion polls and voter turnout is related though distinct, however, in that we examine the way in which fluctuations in opinion polls influence voter turnout, rather than engaging with a more static consideration of absolute level of support for candidates and exposure to polling information in the first instance. The above literature either explicitly or implicitly regards uncertainty as an issue of information availability. We, however, are defining uncertainty in public opinion differently, as fluctuations in opinion polls. We assume that the public is exposed to opinion polling

information; whether they engage with it or not is secondary. Another commonly deployed definition of uncertainty with reference to opinion polls is closeness of elections (Gorecki 2009); Gorecki found that the closer the election (as dictated by the opinion polls), the more uncertain it is; and the more uncertain the election is under this definition, the higher the turnout. Again, whilst we are similarly aiming to uncover a relationship between political engagement and uncertain public opinion, we conceptualize uncertainty in a novel way.

Existing literature, furthermore, at a foundational level, queries the validity of using opinion polls as a gauge of public opinion, and methodology as related to the requirements of public opinion measurement (Albig, Clark, Schramm, Gallup, Stock, Crossley and Meier 1949; Keeter, Igielnik, and Weisel 2016; Ansolabehere and Iyengar 1994). Our research palpably integrates such work in political communications, as we are utilizing opinion polls as a proxy of public opinion, assuming fluctuations provide somewhat of an insight into uncertainty.

Moreover, our research incorporates ideas from prevailing literature on rational choice theory, social choice theory and political psychology (Harder and Krosnick 2008; Downs 1957). The literature emphasises that voter turnout is a "multiplicative function" (Harder and Krosnick 2008) of motivation, ability and difficulty involved in voting. Voter turnout is, moreover, examined in light of individual utility or 'total reward' obtained from voting. In interpreting our results, we use this notion, combined with Downs' equation (1957); but unlike conventional approaches in the literature, we adjust this using a utilitarian social welfare function to reveal perceived social utility or reward. This allows the influence of fluctuating opinion polls on voter turnout to be interpreted on an aggregate, society-wide level.

Methodology

The focus of this paper is to investigate the effect of uncertainty in public opinion on political engagement. Fluctuations in opinion polls in each state are used as a proxy for uncertainty in public opinion in that state.

To begin, we establish why fluctuations in opinion polls constitute a suitable proxy for uncertainty in public opinion. Often, researchers not directly involved in attitude and opinion research critique those who are on the basis that it seems impossible for there to be a theoretical framework structuralising the whole of public opinion. It is fundamentally misguided to presume that public opinion, an inherently "organic process" (Meier and Saunders 1949), is quantifiable. Discharging this objection requires one to acknowledge that there are few other methods for sampling a public (conceived as an organic social system). Indeed, the media and sentiment questionnaires provide insights, yet opinion polling appears the most formal quantitative convention in existing literature. Further, public opinion is *approximated* by opinion polls; we do not expect an isomorphism (exact mapping) between the two. Fundamentally, though fluctuations in opinion polls may be an imperfect proxy for uncertainty in public opinion, this does not entail that they are unworkable.

Differences in the fluctuation of polls and different turnout rates in the 51 states is the key issue this paper addresses. We suspect a linear relationship between fluctuations in state opinion polls and turnout rate, and thus this paper deploys a multivariate linear regression. Fluctuations is the regressor of interest, turnout rate is the outcome variable and other

regressors are of control purposes. The null hypothesis from the regression below is that there is no correlation between fluctuations and turnout rate; the alternative hypothesis is that there is a correlation. LABEL AS EQUATION (1)

$$Turnout\ rate_i = \beta_4 GDP\ per\ capita_i + \beta_5 Population\ density_i + \beta_6 Poverty\ rate_i + \beta_7 Age_i + \beta_8 Number\ of\ polls_i + \beta_9 Swing_i + \beta_{10} Electoral\ Vote_i + \varepsilon_i \quad (1)$$

State turnout rate is sourced from the United States Election Project. Data on opinion polls come from a compilation of opinion polls by FiveThirtyEight, indicating the voting intentions for each candidate in every state. In the context of the US presidential election, there were only two leading presidential candidates. This implies fluctuations of one would closely mirror that of the other. Therefore, we focus on the fluctuations in voting intentions for one candidate at a time.

We use two methods to quantify fluctuations. First, the standard deviation of voting intentions for one candidate (F1). Second, we compare voting intentions of each week to that of last week (F2). For both methods, we aggregate the fluctuations of each week over a timespan of twelve weeks to the run up of the actual Election Day.

$$Fluctuations_i{}^1 = \sqrt{\frac{1}{T-1}\sum_{t=1}^{T}(x_{it} - \overline{x_{it}})^2} \quad (F1)$$

$$Fluctuations_i{}^2 = \frac{1}{T-1}\sum_{t=2}^{T}|x_{i,t} - x_{i,t-1}| \quad (F2)$$

We strive to make fluctuations a good proxy for changing public opinions. We use polling data from different companies in our measurement of fluctuations to improve reliability of our proxy. Measuring fluctuations in opinion polls on a daily basis creates problems because different polling companies employ different polling methodologies. Furthermore, different polling companies conducted surveys at different times with different frequencies. Daily fluctuations in polling data may thus merely reflect differences caused by different polling methodologies. One remedy for this is to measure fluctuations in opinion polls on a weekly basis. We argue that across a longer period, differences in the percentage of people who intended to vote for one candidate will eventually reflect fundamental changes in public opinion, instead of different polling methodologies.

Considering that polls take time to be conducted, we take the end date of polls carried out as the time reflecting the result of voting intention for reason of convention based on industry practice. To improve on the accuracy of the fluctuations data, we eliminate the results of voting intentions from polling companies with a grade below B-.

In order to capture only the effect of fluctuation in public opinion on turnout we control for nine other factors for each state: education (percentage high school graduates), population, income (GDP per capita), population density (people per square miles), poverty rate (percentage below the poverty line), age (median age), number of polls (total number of polls used), swing (swing state or not), and electoral votes (number of electoral votes).

Research consistently links higher educational attainment, β_2, to higher political participation either as education provides the skills, or acts as a proxy for a pre-existing disposition, to engage more politically. Cross sectional studies addressing turnout in a given year generally show that turnout rises with income, controlled by GDP per capita, β_4, and poverty rate, β_6. Swing states, β_9, and states with a higher number of electoral votes, β_{10}, see a higher turnout of voters who feel their vote is more likely to affect the elections result. All can impact fluctuations by, for example, affecting political engagement which may make one's opinion more sensitive to recent changes in the political sphere.

Population density, β_5, generally has a small negative relationship with voter turnout (Preuss 1981) and similarly higher total population, β_3, often leads to a lower turnout rate perhaps as, in both cases, individuals feel a decrease in their sense of political importance. Both may influence poll fluctuations; for example, those who perceive their vote to be of little significance may be more willing to change their viewpoint.

Elections across a range of societies show considerably higher turnout amongst the old than the young making median age, β_7, a suitable control. Age could impact turnout fluctuations, perhaps older voters already have a strong political affiliation fostered over many years.

The number of polls, β_8, taken in each state relate to the turnout by acting as a proxy for a variety of factors, for example polls are more likely to be taken where results have been close previously. The number of polls will likely decrease weekly fluctuations, as one increases the sample size variance from the true poll should decrease so that F1 and F2 reflect real changes in public opinion to a greater extent.

Data Analysis and Theoretical Discussion

Table 1.1 to 2.4 provide the regression estimates from equation (1) for 2008 and 2012 presidential elections. The estimated coefficients for fluctuations in opinion polls are mostly negative, but some are positive. To explore whether the correlation is due to chance or pattern, we test for its statistical significance by dividing the coefficient by its robust standard error and find that uncertainty in public opinions has a statistically insignificant effect on voter turnout in 2008 and 2012. Robustifying standard errors allows us to mitigate the effect of heteroskedasticity. However, we are only able to calculate fluctuations in opinion polls for 24 states because many states do not have sufficient polling data available. With this small sample size, we do not have sufficient power to detect significance of coefficients. The estimated coefficients do not inform us of the relationship between fluctuations and voter turnout at this stage.

Table 3.1
Linear regression

Number of obs	50
F(10, 39)	12.13
Prob > F	0.0000
R-squared	0.7342
Root MSE	.03208

Turnout16	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
F2Trump	-.9403903	.4162284	-2.26	0.030	-1.782292	-.098489
Population16	5.96e-09	1.45e-08	0.41	0.683	-2.34e-08	3.53e-08
Educ16	.9428121	.314541	3.00	0.005	.3065929	1.579031
GDPp/c16	2.42e-07	6.49e-07	0.37	0.711	-1.07e-06	1.56e-06
Popdensity16	.0000123	.0000214	0.57	0.569	-.000031	.0000555
Poverty16	-.2975461	.2719382	-1.09	0.281	-.847593	.2525007
Age16	.0062183	.0020342	3.06	0.004	.0021038	.0103328
No.polls16	-.0003906	.0005713	-0.68	0.498	-.0015461	.0007649
Swing	.0423835	.0144287	2.94	0.006	.0131987	.0715683
ElectoralVote	-.0042072	.0109683	-0.38	0.703	-.0263927	.0179783
_cons	-.3926882	.3190349	-1.23	0.226	-1.037997	.2526207

Table 3.2
Linear regression

Number of obs	50
F(10, 39)	12.27
Prob > F	0.0000
R-squared	0.7382
Root MSE	.03184

Turnout16	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
F1Trump	-1.157455	.4155617	-2.79	0.008	-1.998007	-.3169018
Population16	6.52e-09	1.44e-08	0.45	0.654	-2.27e-08	3.57e-08
Educ16	1.005967	.2971313	3.39	0.002	.4049627	1.606972
GDPp/c16	3.95e-07	6.67e-07	0.59	0.557	-9.54e-07	1.74e-06
Popdensity16	6.23e-06	.000022	0.28	0.778	-.0000382	.0000507
Poverty16	-.2431498	.2543346	-0.96	0.345	-.7575901	.2712906
Age16	.0061104	.0019327	3.16	0.003	.002201	.0100197
NO.polls16	-.0003619	.0005766	-0.63	0.534	-.0015282	.0008044
Swing	.0410681	.0144808	2.84	0.007	.011778	.0703582
ElectoralVote	-.0046079	.0109613	-0.42	0.677	-.0267792	.0175633
_cons	-.4538559	.2884934	-1.57	0.124	-1.037389	.1296772

Table 3.1 to 3.4 show the regression estimates from equation (1) in the context of the 2016 US Presidential Election. R-squares, which are indicative of the explanatory power of the model, range between 70.9% to 73.8%. All the independent variables explain approximately 70% of the variation in voter turnout. The estimated coefficient for F1 is -0.94. This means that all other things being equal, on average, a 1% increase in average weekly fluctuations in the percentage of people intended to vote for Trump is associated with a 0.94% decrease in voter turnout. Different measures of fluctuations in opinions polls deliver complementary results. The estimated coefficient for F2 is -1.16. The interpretation is that for 1 increase in standard deviation of percentage of electorate intended to vote for Trump, there is a 1.16% decrease in voter turnout.

In contrast to 2008 and 2012, uncertainty in public opinion now has a statistically significant effect on voter turnouts. With a large enough sample size, we have a lower type II error (that is, failing to reject the null when it is false). This larger sample size is because for the 2016 Presidential Election, we can calculate weekly fluctuations in opinion polls for all the 50 states with greater availability of data. This explains why we could uncover a significant effect; we have greater power to detect the significance. If the public is more uncertain about the choice of president, ceteris paribus, people will be less likely to participate in the election. The regression tables also show that educational attainment, median age, and dummy variable swing all have positive and statistically significant effects on turnout rate. These confirm many findings in the literature.

Downs' Equation of Voting Behaviour: $Ri = (Pi)\,(Bi) - Ci + Di$ (2)

Individual Utility: $Ui = max\,(Ri, 0)$ (3)

Probability of Voting: $Pr\,(Ri>0)$ (4)

We can now explain our results using a theoretical framework. Downs (1957) proposed the rational choice theory to predict individual voting behaviour. In equation (2), R is the reward a citizen will gain from voting; B is the 'utility' benefit a person thinks they will derive from having their preferred candidate win; P is the person's perception of the probability that their one vote will change the election outcome; C represents individual voting cost in terms of time, money, and other resources; and finally, D represents the psychological satisfaction the person would gain from voting (Harder and Krosnick 2008). A person will only vote if R is positive. In utility terms, one would get zero utility if one does not vote. Person A's utility would be either Ri or 0, whichever is the largest.

It is widely accepted that inferring individual-level behaviour from correlations at the aggregate state-level could result in an ecological fallacy. Therefore, based on our results, we cannot claim that with greater uncertainty, an individual voter will derive less utility from voting and hence would be less likely to vote.

Utilitarian Social Welfare Function: $W = \sum_{i=1}^{n} Ui$ (5)

We subsequently attempt to maximise utilitarian social welfare function in equation (5), which aggregates individual utilities, ascribing equal weight to each individual. We can argue that, in accordance with the rational choice theory and social choice theory, on a societal level, more uncertainty in public opinion leads to less social utility derived from participating in the democratic process. Hence society as whole is less likely to vote. This is because with higher uncertainty (as represented by more fluctuations in opinion polls), we can postulate that, on average, the psychological satisfaction of participating in the democratic process (D) decreases. Therefore, as D decreases in equation (2), W falls accordingly.

Limitations of Data and Methodology

Paul Whiteley and Harold Clarke (2016) questioned the reliability of opinion polls. Opinion polls may not be representative of the entire population. If samples in the opinion polls are not representative of the entire population, then fluctuations in opinion polls will not represent changing public opinion about the choice for presidency in the wider population. Another problem of the quality of opinion polls, even with random sampling, is that if a sizable number of respondents do not tell the truth, this will invalidate the use of fluctuations in opinion polls as a proxy for uncertainty in public opinion.

In addition to issues arising from interspatial representativeness, one should also question the intertemporal representativeness of the dataset, since it only contains three elections. If one wants to use data from the 2016 election to infer the relationship between uncertainty in public opinions and voter turnout in a wider period, one would need to subsequently test whether political and economic circumstances in 2016 are in fact representative of a wider period.

Moreover, there are inevitable limitations of the OLS technique. A trained econometrician would identify the issue of endogeneity in the model (correlation between regressors and errors), which makes the OLS estimates biased and inconsistent (Wooldridge, 1960). Endogeneity can arise for many reasons. The presence of classical measurement error would introduce attenuation bias in the estimated coefficients on the mismeasured regressors in our model. First, polling companies can make administrative errors in their data collection or processing resulting in measurement error. Second, different polling companies with different objectives employing different polling methodologies can lead to a systematic error in the resulting poll data. For example, if one company chooses to include a third candidate, whilst the other does not, this would mean that the poll for the two primary candidates, which we focus on in our research, would be different from the one that includes a third candidate, even though two polls could be an accurate depiction of public opinion. Third, qualitative biases of many respondents might mean they interpret the meaning of questionnaire questions incorrectly (or differently) and give wrong responses.

More importantly, the omission of relevant variables would lead to omitted variable bias (OVB). All relevant variables must be accounted for so that the relationship between fluctuations in opinion polls and turnout rate is, ceteris paribus, causal. For example, efforts spent on campaigning in each state by presidential candidates could result in more uncertainty in public opinion as people hear diverging promises from both sides. More campaigning efforts can also motivate people to cast their votes, hence correlation between error and regressor. Omission of this hard-to-quantify variable can lead to bias. However, given that we have considered a wide range of potential confounding factors, it is likely that the effect of omitted variables is minimal.

Conclusion

To conclude, our results indicate that uncertain public opinion had a demobilizing effect on political engagement in the 2016 US presidential election. More fluctuations in opinion polls, a proxy for uncertain public opinion, are associated with lower voter turnouts, the measure

for political engagement. Addressing the issue of endogeneity can enable us to claim that the correlation between fluctuations and public opinion implies a causality between them. A possible means of interpreting this would be through a social choice theory. Namely, more fluctuations in opinion polls may lower perceived social utility acquired from voting, thus decreasing voter turnout.

Our preliminary findings appear to have implications for further research into various fields of political psychology, theory and communication. A groundwork is provided, for instance, for (i) whether such a trend holds across countries, across time, and various demographics, (ii) how strong the demobilizing effect is, and as such whether it warrants cause for concern or is simply endemic to the democratic process, and (iii) whether and how the demobilizing influence of uncertainty in public opinion on political engagement may be mitigated. Having established this, therefore, pessimism would be premature. Such diagnoses are necessary first steps to improving the health of our democracies.

Data sources

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Appendix

Table 1.1
Linear regression

					Number of obs =	24
					F(5, 18) =	9.96
					Prob > F =	0.0001
					R-squared =	0.6943
					Root MSE =	.03077

Turnout08	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
F1Obama	.0521528	1.026793	0.05	0.960	-2.105059	2.209364
Educ08	1.561135	.3520871	4.43	0.000	.8214273	2.300843
No.polls08	.0005142	.0005309	0.97	0.346	-.0006013	.0016297
Swing	.0195176	.015096	1.29	0.212	-.0121978	.0512331
ElectoralVote	.0012704	.0008789	1.45	0.166	-.000576	.0031169
_cons	-.7350413	.3284391	-2.24	0.038	-1.425066	-.0450163

Table 1.2
Linear regression

					Number of obs =	41
					F(5, 35) =	11.19
					Prob > F =	0.0000
					R-squared =	0.6384
					Root MSE =	.03479

Turnout08	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
F2Obama	-.1323557	.6837557	-0.19	0.848	-1.520454	1.255742
Educ08	1.026699	.1906067	5.39	0.000	.6397463	1.413651
No.polls08	.0004623	.000463	1.00	0.325	-.0004777	.0014023
Swing	.0209331	.0140703	1.49	0.146	-.0076312	.0494974
ElectoralVote	.0004015	.000525	0.76	0.450	-.0006644	.0014673
_cons	-.2563074	.1725675	-1.49	0.146	-.6066381	.0940234

Table 1.3
Linear regression

					Number of obs =	42
					F(5, 36) =	11.09
					Prob > F =	0.0000
					R-squared =	0.6350
					Root MSE =	.03477

Turnout08	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
F1McCain	-.2808381	.6311255	-0.44	0.659	-1.56082	.9991437
Educ08	1.023196	.2111039	4.85	0.000	.5950577	1.451335
No.polls08	.0004961	.0004711	1.05	0.299	-.0004593	.0014515
Swing	.0207528	.0161454	1.29	0.207	-.0119917	.0534972
ElectoralVote	.0003736	.0005858	0.64	0.528	-.0008144	.0015616
_cons	-.2518958	.1801004	-1.40	0.170	-.6171564	.1133648

Table 1.4
Linear regression

Number of obs = 27
F(5, 21) = 13.93
Prob > F = 0.0000
R-squared = 0.7088
Root MSE = .03483

Turnout08	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
F2McCain	-1.876651	1.212849	-1.55	0.137	-4.398908	.6456062
Educ08	1.467488	.3516714	4.17	0.000	.7361477	2.198829
No.polls08	-.000451	.0006899	-0.65	0.520	-.0018858	.0009838
Swing	.0172666	.0196301	0.88	0.389	-.0235564	.0580896
ElectoralVote	.0010556	.0008653	1.22	0.236	-.000744	.0028551
_cons	-.5820867	.2958886	-1.97	0.063	-1.197421	.0332475

Table 2.1
Linear regression

Number of obs = 31
F(10, 20) = 10.71
Prob > F = 0.0000
R-squared = 0.8000
Root MSE = .03365

Turnout12	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
F1Obama	1.854659	1.318743	1.41	0.175	-.8961914	4.605509
Population12	1.45e-08	3.57e-08	0.40	0.690	-6.01e-08	8.90e-08
Educ12	1.835055	.4357405	4.21	0.000	.9261164	2.743994
GDPp/c12	-1.83e-06	1.19e-06	-1.54	0.139	-4.30e-06	6.48e-07
Popdensity12	.0000105	.0000261	0.40	0.691	-.0000439	.0000648
Poverty12	-.5004851	.3216212	-1.56	0.135	-1.171375	.170405
No.polls12	-.000705	.0004243	-1.66	0.112	-.00159	.00018
Age12	-.0054493	.0057615	-0.95	0.356	-.0174675	.0065689
Swing	.0535382	.0150721	3.55	0.002	.0220983	.0849781
ElectoralVote	-.0085864	.0258271	-0.33	0.743	-.0624608	.0452881
_cons	-.6883132	.3394249	-2.03	0.056	-1.396341	.0197148

Table 2.2
Linear regression

Number of obs	22
F(9, 11)	.
Prob > F	.
R-squared	0.8134
Root MSE	.03524

Turnout12	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
F2Obama	.6124883	1.15878	0.53	0.608	-1.937969	3.162946
Population12	2.93e-08	4.23e-08	0.69	0.503	-6.38e-08	1.22e-07
Educ12	1.982953	.5386202	3.68	0.004	.7974582	3.168449
GDP12	-1.25e-06	3.27e-06	-0.38	0.710	-8.44e-06	5.95e-06
Popdensity12	9.01e-06	.000032	0.28	0.783	-.0000614	.0000794
Poverty12	-.4155258	.6505356	-0.64	0.536	-1.847345	1.016293
No.polls12	-.0007035	.0004884	-1.44	0.178	-.0017784	.0003714
Age12	-.0115092	.0076285	-1.51	0.160	-.0282994	.0052809
Swing	.0605771	.0179982	3.37	0.006	.0209634	.1001908
ElectoralVote	-.0187199	.0306273	-0.61	0.553	-.0861302	.0486904
_cons	-.6003381	.5323314	-1.13	0.283	-1.771992	.5713155

Table 2.3
Linear regression

Number of obs	24
F(9, 13)	.
Prob > F	.
R-squared	0.8313
Root MSE	.033

Turnout12	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
F2Romney	.1760316	.6710031	0.26	0.797	-1.273582	1.625646
Population12	1.79e-08	4.26e-08	0.42	0.680	-7.41e-08	1.10e-07
Educ12	1.936654	.446124	4.34	0.001	.9728614	2.900446
GDPp/c12	-1.68e-06	1.61e-06	-1.04	0.316	-5.16e-06	1.80e-06
Popdensity12	.0000184	.000022	0.83	0.419	-.0000292	.0000659
Poverty12	-.4849592	.4994196	-0.97	0.349	-1.56389	.5939713
No.polls12	-.000579	.0003833	-1.51	0.155	-.0014072	.0002491
Age12	-.0119099	.004685	-2.54	0.025	-.0220313	-.0017885
Swing	.0580101	.0127965	4.53	0.001	.0303651	.0856552
ElectoralVote	-.01096	.0307055	-0.36	0.727	-.0772951	.0553752
_cons	-.5209084	.4888523	-1.07	0.306	-1.57701	.5351928

Table 2.4
Linear regression

Number of obs	30
F(10, 19)	16.93
Prob > F	0.0000
R-squared	0.8612
Root MSE	.02864

Turnout12	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
F1Romney	-.3381832	.9423557	-0.36	0.724	-2.310556	1.63419
Population12	-8.38e-09	3.33e-08	-0.25	0.804	-7.81e-08	6.13e-08
Educ12	1.729449	.4178145	4.14	0.001	.8549536	2.603945
GDPp/c12	-2.26e-06	1.17e-06	-1.93	0.068	-4.71e-06	1.85e-07
Popdensity12	.0000166	.0000251	0.66	0.517	-.000036	.0000692
Poverty12	-.5872917	.324164	-1.81	0.086	-1.265775	.0911914
No.polls12	-.0003786	.0002497	-1.52	0.146	-.0009013	.000144
Age12	-.0031977	.0049496	-0.65	0.526	-.0135573	.007162
Swing	.056007	.0121635	4.60	0.000	.0305486	.0814654
ElectoralVote	.0077394	.0239463	0.32	0.750	-.0423809	.0578596
_cons	-.6520733	.3484108	-1.87	0.077	-1.381306	.0771589

Table 3.1
Linear regression

Number of obs	50
F(10, 39)	12.13
Prob > F	0.0000
R-squared	0.7342
Root MSE	.03208

Turnout16	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
F2Trump	-.9403903	.4162284	-2.26	0.030	-1.782292	-.098489
Population16	5.96e-09	1.45e-08	0.41	0.683	-2.34e-08	3.53e-08
Educ16	.9428121	.314541	3.00	0.005	.3065929	1.579031
GDPp/c16	2.42e-07	6.49e-07	0.37	0.711	-1.07e-06	1.56e-06
Popdensity16	.0000123	.0000214	0.57	0.569	-.000031	.0000555
Poverty16	-.2975461	.2719382	-1.09	0.281	-.847593	.2525007
Age16	.0062183	.0020342	3.06	0.004	.0021038	.0103328
No.polls16	-.0003906	.0005713	-0.68	0.498	-.0015461	.0007649
Swing	.0423835	.0144287	2.94	0.006	.0131987	.0715683
ElectoralVote	-.0042072	.0109683	-0.38	0.703	-.0263927	.0179783
_cons	-.3926882	.3190349	-1.23	0.226	-1.037997	.2526207

Table 3.2
Linear regression

Number of obs	50
F(10, 39)	12.27
Prob > F	0.0000
R-squared	0.7382
Root MSE	.03184

Turnout16	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
F1Trump	-1.157455	.4155617	-2.79	0.008	-1.998007	-.3169018
Population16	6.52e-09	1.44e-08	0.45	0.654	-2.27e-08	3.57e-08
Educ16	1.005967	.2971313	3.39	0.002	.4049627	1.606972
GDPp/c16	3.95e-07	6.67e-07	0.59	0.557	-9.54e-07	1.74e-06
Popdensity16	6.23e-06	.000022	0.28	0.778	-.0000382	.0000507
Poverty16	-.2431498	.2543346	-0.96	0.345	-.7575901	.2712906
Age16	.0061104	.0019327	3.16	0.003	.002201	.0100197
NO.polls16	-.0003619	.0005766	-0.63	0.534	-.0015282	.0008044
Swing	.0410681	.0144808	2.84	0.007	.011778	.0703582
ElectoralVote	-.0046079	.0109613	-0.42	0.677	-.0267792	.0175633
_cons	-.4538559	.2884934	-1.57	0.124	-1.037389	.1296772

Table 3.3
Linear regression

Number of obs	50
F(10, 39)	11.74
Prob > F	0.0000
R-squared	0.7094
Root MSE	.03354

Turnout16	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
F1Clinton	-.6593363	.4140194	-1.59	0.119	-1.49677	.1780971
Population16	6.91e-09	1.57e-08	0.44	0.662	-2.48e-08	3.86e-08
Educ16	.8299703	.3088847	2.69	0.011	.2051921	1.454748
GDPp/c16	7.17e-07	7.06e-07	1.02	0.316	-7.11e-07	2.15e-06
Popdensity16	-3.58e-06	.000023	-0.16	0.877	-.00005	.0000429
Poverty16	-.2581336	.2741387	-0.94	0.352	-.8126314	.2963642
Age16	.0064968	.0022603	2.87	0.007	.0019249	.0110688
No.polls16	.0000237	.0005639	0.04	0.967	-.0011168	.0011643
Swing	.0381878	.0155714	2.45	0.019	.0066917	.0696838
ElectoralVote	-.0048656	.011789	-0.41	0.682	-.0287111	.0189798
_cons	-.3571791	.3142658	-1.14	0.263	-.9928416	.2784834

Table 3.4
Linear regression

Number of obs	50
F(10, 39)	11.98
Prob > F	0.0000
R-squared	0.7132
Root MSE	.03333

Turnout16	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
F2Clinton	-.6456602	.3018654	-2.14	0.039	-1.256241	-.0350799
Population16	8.46e-09	1.57e-08	0.54	0.592	-2.32e-08	4.01e-08
Educ16	.8733705	.3097265	2.82	0.008	.2468895	1.499851
GDPp/c16	7.43e-07	6.78e-07	1.10	0.280	-6.28e-07	2.11e-06
Popdensity16	-4.33e-06	.0000226	-0.19	0.849	-.0000501	.0000415
Poverty16	-.2273487	.2742941	-0.83	0.412	-.7821609	.3274635
Age16	.006437	.0020987	3.07	0.004	.002192	.0106819
No.polls16	-.0000398	.0005719	-0.07	0.945	-.0011966	.0011171
Swing	.0374087	.0156912	2.38	0.022	.0056702	.0691471
ElectoralVote	-.0059899	.0117789	-0.51	0.614	-.0298149	.0178351
_cons	-.3948473	.3119963	-1.27	0.213	-1.025919	.2362248