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Contributions of the Poll Gap

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I. Introduction

The common theory about the success of political elections is that the more money a campaign spends, the more votes they will receive and if they spend more than their opponent, they should have a good chance of winning. However, there are certain regulations that have been put into place to reduce the impact that Political Action Committees (PACs) have on important elections like the presidential election. Because of these regulations, candidates have been seeking public funding in the form of donations by targeting individuals.

Early in his presidency, George W. Bush signed the Bipartisan Campaign Reform Act of 2002. This law includes many campaign finance regulations that change the way campaigns can raise money and receive funding. Two important factors of the BCRA is that it limits the amount of money PAC's can raise and contribute to a candidate's campaign and it also increased the amount of money that an individual can donate to a candidate from $1,000 to $2,000. Essentially, there is a stronger target market among individual donors than there used to be. For this reason, measuring public donations and how they are influenced could change the way campaigns solicit donors and gain popularity.

The question that this paper will seek to answer is "Does the election poll gap influence the number of donations a presidential candidate receives?" I expect to see that the smaller the poll gap, the more donations a campaign will receive. The utility of donating is higher in hopes to boost the candidates campaign ahead of his or her running mate. The larger the poll gap is, lower the utility because that donation is not likely to make a difference.

This paper first examines the past and current literature. A theoretical utility maximization model is then built to show a person's optimal level of donations, given their budget constraint. I adjust this model to account for the poll gap and variations in the preference to donate. I then tested this model empirically for each political party's presidential nominee. The results match my theory for one candidate but not for both.

II. Literature Review

The literature regarding campaign donations and the variables affecting them includes three major themes. The first theme is how the characteristics of the candidate and the election influence voter preferences. The second theme is the influence of poll data on the average voter. The third addresses the effects of laws and special interest groups on campaign finance. Finally, the last considers the media's influence on the number of donations received by individual campaigns.
The first theme includes four pieces of literature that address what characteristics of a campaign and election affect an individual's preference to donate. Schwabey (2009) concludes in his work that voters prefer sequential elections so that they can minimize the likelihood of funding an unsuccessful campaign and maximize the chances of donating to a successful candidate.

(Schwabey, R 2009) For example, the U.S. presidential election structure is a sequential election. Because of the intra-party primary races, voters prefer this type of election because they can wait to see if their candidate makes it to the general election before deciding whether to donate. Only a small number of candidates are in the general election, and so potential donors are more likely to fund the successful candidate at that stage. The second piece of literature for this theme (Austen-Smith, 1987) focuses on how the utility of donating depends on the policies and beliefs of the candidates. This deals with both individuals and interest groups. If the candidate running for office has ideas to implement policies that correlate with that individual's or interest group's opinion, then they are more likely to donate to that candidate. Austen-Smith (1987) also talks about the candidate's perspective, noting that if a candidate cannot become popular by promoting his or her own values and policies that they wish to implement, they will associate themselves with the beliefs and values of the most popular candidates to gain publicity and funding. The third work in this theme, Brown (2009), considers how voters perceive the differences in self-financed vs publicly financed gubernatorial elections. He finds that self-financed campaigns tend to be unsuccessful compared to publicly financed campaigns in the state governor elections. (Brown, A. 2009) This makes sense because the more support you have from the public who eventually end up voting for the positon you're running for, the more likely you are to receive those votes and win that election. The final piece of literature in this theme is Grant and Rudolph (2002). Their study shows that the people who tend to donate to a campaign and vote in elections are people of older age that are well educated and have steady income.

Our second theme, influence of poll data on donor behavior, includes two sources. Restrepo et al. (2009) find that when polls are accurate, younger people tend to pay more attention and participate in voting and contributing to the political race. Similarly, if the polls are inaccurate, young people are not likely to participate. The second source (Panagopoulos 2009) investigates the accuracy of the poll predictions for each presidential election from 1950 until 2008, focused mainly on the 2008 election. They conclude that pre-election polls are very accurate.

The third literature theme regards the effects of laws and special interest groups on campaign donations. Austen-Smith (1987) again writes about how candidates target large interest groups to receive funding for their campaigns and the targeting is determined by which interest groups match the goals of the candidate looking for funds. Chappell (1982) finds that interest groups have very little effect on how a congressman or woman votes on policies. However, a later study done by Stratmann (1991) found that the candidates that seek funding do in fact vote accordingly with the way the interest groups that funded them would want them to vote. This validates that there is utility in donating to a campaign as an interest group. The final source in this theme, Briffault (2003), examines how the Bipartisan Campaign Reform Act (BCRA) of 2002 signed by George W. Bush affects the structure of campaign finance. This law limits the amount of money an interest group or PAC can donate while increasing the limit for individual donations, ultimately promoting publicly financed campaigns to increase the competitiveness of the race.

The fourth and final theme is the role that the media plays in the way individuals donate. Restrepo et al (2009) argued that poll accuracy effects how young people vote. Because that poll data is shown to the public by the media, we can say that media showing accurate or inaccurate poll data effects the way young people donate and vote. Fowler (2008) analyzes the effect of an appearance by a candidate on Stephen Colbert's show, The Colbert Report. He finds that a

candidate that sits in on Stephen's show, receives a tremendous spike in donations received for the next month. (Fowler, 2008)

Overall, these sources are in line with the entire theory this paper seeks to prove. I asked the question, "Does the election poll gap influence the number of donations a presidential candidate receives?" The literature has shown that polls presented by the media do in fact create an incentive for people to participate in political campaigns and that poll data is historically accurate. It also shows that there is utility in donating to a candidate, sequential elections are more likely to receive more donations, and that publicly financed campaigns are more successful that self-funded ones. With these conclusions, we do have a strong, evidence backed theory.

III. Theoretical Model

To answer this question, does the poll gap influence donations, I will use the Utility Maximization model. This utility maximization model will show the donation level that will maximize the utility of the consumer given their budget constraint. The equation for an individual's budget constraint is as follows: $I=P_xX + P_yY$ where I is income and P_x and P_y are both the price of good X and good Y respectively. In my model, I substituted D for X to stand for donations. The Y axis shows the composite good, or the number of units a person buys of everything else except making donations. U*, or the optimal point, is the utility maximizing point on the budget constraint that shows the right balance of amount of money donated (D*) and amount delegated to the composite (Y*) that maximizes that individual's utility.

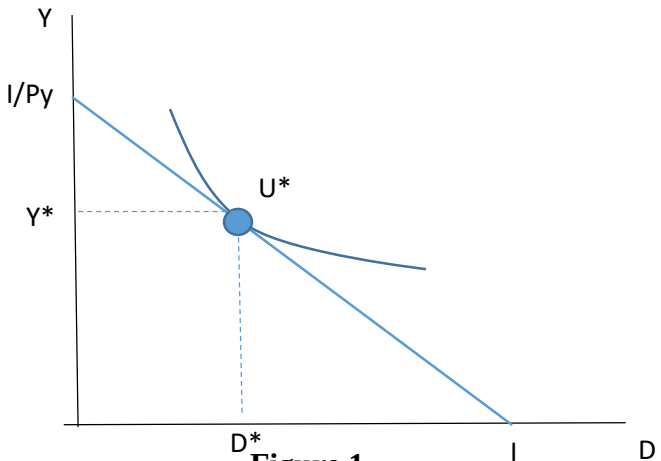

Figure 1

I assume a utility function of $U=D^{\propto} Y^{1-\propto}$, therefore making the equation for MRS = $-\frac{\propto}{1-\propto}\frac{Y}{D}$. The marginal rate of substitution is the rate at which an individual gives up one good in exchange for another while remaining at the same utility level. We find D* and Y* by first isolating Y in the MRS equation. We then plug that term into the budget constraint and solve for D*. Once we find D* we can plug that back into the first term we found for Y* and solve. D* and Y* are the optimum purchase levels of both the composite good and the amount of money donated. This work is shown mathematically in Figure 2.

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MRS: $(-\frac{\propto}{1-\propto})\ \frac{y}{D} = -\frac{1}{Py}$ $\quad I = D+P_yY$

(1) $\frac{\propto}{1-\propto} Y = \frac{D}{Py} \longrightarrow \mathbf{Y = \frac{1-\propto}{\propto}(\frac{D}{Py})}$

(2) $I = D + P_y(\frac{1-\propto}{\propto}\frac{D}{Py}) \longrightarrow I = D + \frac{\mathbf{1}-\propto}{\propto} D$

$I = D(1+\frac{\mathbf{1}-\propto}{\propto}) \longrightarrow \mathbf{D^* = I(\propto)}$

(3) $Y = \frac{1-\propto}{\propto}(\frac{\propto}{I})(\frac{Py}{1}) \longrightarrow \mathbf{Y^* = \frac{I(1-\propto)}{Py}}$

Figure 2

The motivation to donate to a candidate's campaign comes from the satisfaction that your donation will make a difference in whether the candidate wins or not. One wouldn't donate to a campaign that is winning or losing by a large margin because it isn't likely that their donation will matter. When the race is close, each donation could be the difference in winning or losing. The utility of donating will depend on how close the election polls are. The closer the polls are, the higher the utility of a donation will be. $\propto$ is a number between 0 and 1 that shows the preference the individual has for donating. When $\propto$ is high, the consumer has a strong preference to donate and the indifference curve will tip towards the X axis. We assume that $\propto$ depends in part on the poll gap (Pg).

As the poll gap increases, one's preference, or alpha, will decrease. I can rephrase this by saying as the poll gap decreases, alpha increases because the utility of donating becomes higher and one's preference to donate is higher. Figure 3 shows the derivatives of D* and I*. We can see that as Pg increases, D* decreases and as Pg decreases, D* increases.

$D* = I(\alpha(pg)) \longrightarrow \frac{2}{2pg} = \propto'(pg) * I$

$Y^* = \frac{I(1-\propto(p_g))}{Py} \longrightarrow \frac{2}{2pg} = [-\propto'(pg)] * \frac{I}{Py}$

Figure 3

We can see these results graphically as well. Figure 4 shows utility maximizing points of consuming a certain amount of the composite good or everything else except donations, and donating a certain amount of one's income to the campaign. It also shows the change in D*, Y* and U* as the poll gap increases. D* decreases, Y* increases, and U* moves upwards along the budget constraint line and tips toward Y as the poll gap increases.

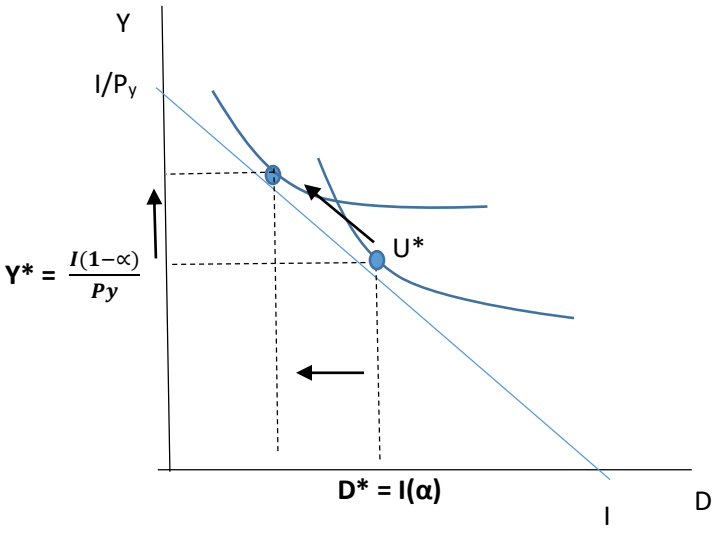

Figure 4

IV. Empirical Analysis

To test this model empirically, I will use an econometrics regression using Stata software. Data was collected from various sources and a regression model was built. The dependent variable is the number of donations received per month by state. Independent variables include the average age of the people in a state, median household income by state, percentage of democrats in a state, no affiliation and whites per state, the population of the state, and two time variables. The key independent variable is of course the poll gap and we expect a negative relationship, meaning as the poll gap shrinks there should be an increase in donations received.

V. Data

Several data sources were used to gather data for these regression models. Poll data was collected from the Real Clear Politics election poll website.[i] The Quinnipiac polls are the ones used in this study, because they have the longest time series out of any of the polls I collected. Donation data for each candidate was retrieved from the Federal Election Commission website.[ii] The remaining data which included state demographics like average age, population, median income, race demographics, and partisanship, was found from sources including the government census website[iii], Pewforum[iv], and the Kaiser Family Foundation[v].

VI. Model

The dependent variable in this model is the number of individual donations made to each candidate. Independent variables include median income, average age, partisanship, percentage whites, and of course the focus of the study, the poll gap for the previous month. We also include time variables, explained below. My main equation of estimation is…

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(1) $Y=B_0+B_1(ABSGAPLAG) + B_2(STATE\ POP) + B_3(INCOME) + B_4(\%\ WHITE) + B_5(\%\ NO\ POLITICAL\ AFFILIATION) + B_6(DEM.\ \%\ IN\ STATE) + B_7(TIME) + B_8(TIMESQ) + B_9(AVG\ AGE) + e$

The main question of the paper is how the poll gap affects the number of donations made to a candidate. We expect to find a negative estimate for B_1. As the absolute value of the poll gap increases, there should be a decrease in the number of donations received, because potential donors will not see this as a close race and therefore the utility of their donation is not very high.

We expect a positive relationship between population and donations. As the state population increases, we see an increase in donations made simply because there are more people. Median household income is expected to have a positive effect as well. As the median household income of a state increases, people can afford to give, and therefore it is likely to receive more donations from that state. The percentage white in an individual state was included to see what effect race had on each candidate's donations. The effect that this variable has on the donations is highly relative to the candidate's personality and policies he or she supports. For example, we wouldn't expect to see a positive relationship between the Hispanics in a state and the number of donations Donald Trump receives due to his immigration views. We include two political affiliation variables, one being percent democratic and the other percentage non-affiliated. We expect to see a positive relationship between donations and the democratic variable for Hilary Clinton, and a negative relationship for Donald Trump. Average age theoretically may have a positive effect seeing as how the older a person is, the more educated they might be, and the more political elections they have seen. They have more expertise on how certain policies will affect them and are more likely to donate to a cause that will benefit their future. The time variable is included because we expect to see donations increase as we get closer to the election. This supports the literature results of how donors prefer sequential elections. We also include a "timesq" variable which is simply the time variable squared. This adjusts for the fact that we predict the donations to be parabolic rather than linear. By adding this variable, we are reducing the residual factors that affect donations.

I ran a regression for each candidate to see the isolated effects of variables such as partisanship on each candidate. My regression results are shown in Table 1.

Table 1

Variable	Model 1 (Clinton)		Model 2 (Trump)	
White	1185.337		-417.713	
	1473.542		*614.820*	
Pop	0.0004	***	0.0001	***
	0.000		*0.000*	
Democrat	7420.837	**	-1225.383	
	3072.156		*1293.838*	
NoAffiliation	3887.475		325.486	
	6339.517		*2612.443*	
MedianIncome	0.034		-0.002	
	0.023		*0.009*	
Absgaplag	-78.434		-87.516	***
	55.426		*25.731*	
AvgAge	-91.354		35.394	
	89.390		*37.041*	
Timesq	71.323	***	83.180	***
	13.483		*5.769*	
Time	-959.229	***	-1074.013	***
	291.595		*94.585*	
_Cons	-1656.362		2367.260	
	3405.358		*1300.641*	
Observations	561.000		566.000	
R-Squared	0.487		0.471	
Adj. R-Squared	0.478		0.462	

- *Standard errors are italicized.*
- **: 0.05< P-value < 0.10*
- ***: 0.01< P-value < 0.05*
- ****: 0.001< P-value < 0.01*

The regressions show interesting results. According to the R^2 calculation for both Trump and Clinton, just under 50% of the variation in donations received per state is explained by the variation in our independent variables. There are only three variables that remain statistically significant throughout both models for Donald Trump and Hillary Clinton, the two time variables and the population of the state variable. They are all significant at the 1% level and their effects all correlate with the theory we presented. The democrat variable was statistically significant for Clinton's regression and shows that a state with a larger percentage of democrats sees more

donations to Secretary Clinton. Specifically, as the percentage of democrats in a state increase by 10%, our regression predicts that there will be approximately 742 more donations received by Hillary Clinton. Considering that the average donations Hillary Clinton received per month for many the states was less than 1000, this is a very high number for just a 10% increase.

Our poll gap variable is significant at the 1% level for Trump's regression but not significant for Hillary. For Trump, every 1 percentage point that the poll gap widens, it is estimated that he will receive 87.5 fewer donations. There is no significant effect for Clinton. One reason for this might be that in the observation period, Clinton always led in the polls. If your candidate is winning in the polls all the time, then poll data may not be a driving factor to donate. On the other hand, with Trump, the Quinnipiac polls show him losing the entire time. So, as the poll gap becomes larger, we see his donations decrease, or vice versa, when the gap is close and he is competing with Clinton, his donations increase, which is in line with our theoretical prediction.

The effect of time follows a quadratic relationship indicating that donations increase faster as the election approaches.

VII. Conclusion

The purpose of this paper was to determine if the poll gap influences the number of donations that a presidential candidate receives. The results do show that as the poll gap shrinks the number of donations a candidate receives increases, but only for Donald Trump. We also see that time has a large effect on donations as well. These results fit with the literature. The utility of donating becomes higher toward the later stages of the election, after the primaries, when the chances of the donor's preferred candidate winning are higher. This study technique can be used in other industries around the country. My study only uses state level data but if we could get county level data, it's possible to determine which counties in the country have strong preferences to donate. Not only can candidates plan their rallies and speeches strategically to hit the strong donating counties but charity organizations can also use this data to target donators more effectively.

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XI. Endnotes

[i] http://www.realclearpolitics.com/epolls
[ii] http://www.fec.gov/disclosure.shtml
[iii] https://www.census.gov/popest/data
[iv] http://www.pewforum.org/religious-landscape-study/compare/party-affiliation/by/state/
[v] http://kff.org/other/state-indicator/state-political-parties/