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Three Essays in American Politics

A dissertation submitted in partial satisfaction
of the requirements for the degree
Doctor of Philosophy in Political Science

by

Marcos Menchaca

2017
In this dissertation, I write three papers on American politics. The first essay, “Do Americans Respond to Presidential Pork?,” examines the impact of presidential pork, party identification, and citizen ideology on presidential vote choice and voter turnout. It could be possible that increased government spending in a person’s local area will increase his income and thus induce him to evaluate the incumbent presidential candidate through retrospective economic pocketbook voting. I also give a counter reasons of why voters would not respond to presidential pork: Americans do not pay much attention to how much the government is spending in their local area especially when people weigh heavily their ideology and party ID when making vote and turnout decisions. I then find, contrary to previous studies, strong evidence that voters do not respond to pork by changing their who they will vote for but find some evidence that people do respond by turning out to vote. My statistical analysis reveals that pork barrel spending did not switch people’s vote choice in favor of the incumbent candidate in the 1988, 2008, and 2012 presidential elections. In fact, I find that the absolute level of spending in per capita terms for a county actually hurt McCain 2008. I do find that pork slightly increases the probability that a person turns out to vote for McCain 2008. But even though the results are statistically significant, they are not substantively significant enough to believe that presidential pork has a huge mobilizing effect for the candidate of the incumbent party. Furthermore, when I analyze the 1988 election between Bush and Dukakis with ANES data, I find that pork has no statistically significant effect on turnout. This leads me to conclude that presidential pork has no significant influence over vote choice or voter turnout.

In the second paper, “A Factional Theory of Parties,” I investigate the conditions under
which groups in society coalesce to form large-tent parties previous to any election. I construct
a formal model where groups seek to win office to implement their ideal points. These groups
can either run on their own in the election or form coalitional parties. Each group has activists
who are able to influence independent voters by contributing campaign resources. Coalitional
parties can form in two cases. First, if there are no intense policy demanders (groups who care
mostly about one policy dimension), then groups will coalesce and combine activist resources
only if their influence in campaigning is significant. Second, if there are many policy dimensions
and intense policy demanders then the influence of activists can be very weak and coalitional
parties will still form. The reason why they form is very similar to vote-trading (logrolling).
And coalitions need not be minimal winning in my model.

In the third paper, “Who Are the Moderates?,” I investigate which Americans are extreme in
their political opinions. I focus on two schools of thought: the political economy school and the
public opinion school. The political economy tradition argues that people are mainly interested
in their material interest: rich people want less income redistribution and poor people want
more. Thus, rich people should be conservative and poor people should be liberal. The public
opinion tradition argues that the more politically informed a person is the more likely she is to
agree with her partisan affiliation. I extend this to imply that more informed people are more
likely to be extreme in their political beliefs. Since Liberal and Conservative ideologies hold
policy positions on many different issues (the economy, abortion, immigration, gay marriage,
the environment), I do a study of how income and political knowledge effects a person’s opinion
on specific issues. I find support for both of these schools of thought on public opinion.
The dissertation of Marcos Menchaca is approved.

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2017
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VITA

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CHAPTER 1

Introduction

In this dissertation, I write three essays on American politics, particularly in the field of political behavior. The first essay asks the question, “do Americans respond to presidential pork?” There has been recent research which argues that Americans are very responsive to presidential pork. The claim is that Americans pay attention to the amount of federal grants that the president sends to the local area and reward the candidate of the incumbent president’s party by having a higher tendency to vote for him. Another claim is that people reward the president for pork by either turning out to vote for him more if they already support him or by not turning out to vote if they oppose him. But people may not pay this much attention to what the president is doing in their local community. So I derive a theory of how it might be possible that the amount of federal grant spending could influence how Americans evaluate the president when making voting decisions: retrospective economic voting. Even though people may not understand how much the president is spending in their county, the economic boost to the local economy may induce people either to switch their vote from the opposition to the candidate of the incumbent president’s party or to turn out to vote for the candidate of the incumbent president’s party. This theory gives two hypotheses. The vote choice hypothesis states that, all else being equal, if a person received more in presidential pork in her county she should be more likely to vote for the candidate of the incumbent president’s party. The turnout hypothesis states that, all else being equal, if a person receives more in presidential pork in her county she should be more likely to turnout for the candidate of the incumbent president’s party. I test these hypotheses using data from the Cooperative Congressional Election Study for the years 2008 and 2012 and the American National Election Study for the year 1988. I use both a standard probit model and and advanced conditional logit model which takes into account the distance between the citizen’s ideology and both of the candidates’ ideology. For my methodology for the turnout hypothesis, I split up the data into people who support the candidate of the incumbent president’s party
and those who do not and then run a separate logit model for both. I do not find any evidence for the vote choice hypothesis. The coefficients either go in the opposite direction that the theory predicts, are statistically insignificant, are substantively insignificant or all three. I find some evidence for the voter turnout hypothesis, but the substantive significance of the statistical results bring serious doubt that presidential pork has a very strong effect on voter turnout.

The second essay asks the question, “under what conditions to political factions form big-tent political parties?” There has been a growing literature which views political parties as being driven by factions in society. And these studies have always assumed that factions would easily form coalitions. However, there was no formal statement on how this would happen. I utilize microfoundational analysis to come up with a formal theory of how groups in society will form coalitions. I assume a world in which there are four groups in society, each with preferences over two policy dimensions. These preferences can be weighted by policy dimension, thus allowing a for a group to care about one policy dimension more than the other (and thus making them an intense policy demander). I also allow for groups to have resources, which they can combine together when they form coalitions, to use to influence the vote of a single independent voter which decides the outcome of the election. When all groups care equally about both policy dimensions, it is very hard for them to coalesce. Only when the influence of campaign resources is very high can they form big-tent parties in this case. When one group become an intense policy demander in one of the policy areas, hardly any easier for that group to coalesce with another party. They are willing to form join in a party with the group which is their non-enemy, but this still requires campaign impact to have a large influence. Even when there are two intense policy demanders, campaign impact needs to have a large influence for big-tent parties to form. I thus conclude that campaign impact is a fundamental factor for factions to form coalitions in a world with only four groups and two policy dimensions. However, when I extend the analysis to where there are six groups and all are intense policy demanders, and where there are three policy dimensions, I find that it does not matter the effect of campaign impact. It is always beneficial for a group to coalesce with another group. This results in all of the groups in either one of the two major coalitional parties. One importance aspect of my model which differs from previous models is that, when the there are six or more groups and three or more policy dimensions and when all groups care only about one dimension, minimal
winning coalitions are not optimal.

My third essay asks the question, “what makes people become extremists in their political opinions?” I focus on two theories which give explanations. First, the political economy school of thought envisions politics as people fighting over material goods. According to this theory, a person should have preferences over economic issues according to the amount of money he makes. Note that this theory only predicts what people’s opinion about economic issues should be. Second, the public opinion tradition argues that partisans listen to thought leaders in their party (political elites) who send cues to their followers about how they should think about particular issues. The more a person listens to these political elites and learn about the cues they are sending to them, the more politically sophisticated that person will be: they will understand each political party’s stance on each issue. Thus, the more they will likely adopt the stance of their political party’s elites. I utilize a new way of operationalizing political sophistication. I measure a person’s level of sophistication by how many times she was able to place the two major American political party’s positions in the right place. I find meager evidence for the political economy hypothesis. The substantive effect is not particularly strong, although it is not negligible. I find very strong evidence for the elite cue hypothesis. The effect is not always as strong as it is in recent times. Moreover, it is not always strong for either Republicans or Democrats in certain issues. But, overall, the effect is usually substantively and statistically significant.
CHAPTER 2

Do Americans Respond to Presidential Pork?

2.1 Introduction

Do Americans respond to presidential distributive spending? The political science literature has either said yes (Kriner and Reeves, 2012, 2015; Chen, 2012; Healy and Malhotra, 2009) or has just assumed that people do respond to presidential pork and have investigated how presidents allocate federal spending (Wright, 1974; Larcinese, Rizzo and Testa, 2006; Taylor, 2008). Kriner and Reeves (2012) and Kriner and Reeves (2015) argue that recipients of large amounts of presidential pork can reward the party of the incumbent president by voting for its candidate in the next election.\(^1\) Moreover, Chen (2012) shows that they can respond to pork by turning out to vote if they were planning on supporting the party of the incumbent president or by abstaining if they were planning to vote against the president’s party. Presidential pork in this paper is defined as either the percentage change in federal grants from the previous year or the per capita dollar amount of federal grants.

But why should pork be considered a major electoral force in presidential elections? After all, Grimmer (2013) gives strong evidence that Americans do not pay attention to the dollar amount that the government spends in their local community. Even if there is good reason to doubt that they do, there actually may be a theoretical justification for this. Although the people may not be paying attention to what the government spends, the spending may stimulate economic activity in their area. And there is a strong line of literature (Fiorina, 1978; Markus, 1988) arguing that people will evaluate the incumbent president based on the status of their own wealth. So presidential pork may not be attributed directly to the president but rather

\(^1\)Sometimes this is the incumbent president himself and sometimes it is a challenger candidate if the incumbent president is retiring.
indirectly through pocketbook retrospective economic voting.

As Chen (2012) notes, Americans can respond to pork by turning out to vote. His theory is that citizens who receive more government spending are more likely to vote to not lose those benefits. More specifically, he hypothesizes that citizens who receive more pork and support the party of the incumbent president may be more likely to turn out to vote for the his party’s candidate and those who do not support his party and receive more pork will be less likely to turn out to vote against his candidate. But he only studies a specific type of presidential pork: natural disaster relief aid. Can his theory be applied to how citizens respond to government spending in general? Perhaps it can considering that there is also evidence from Gomez and Hansford (2015) that citizens take into account the state of the economy when evaluating whether or not to vote in a similar way that they would when retrospectively voting. Although this study is about sociotropic economic voting, we can hypothesize that people can make the same evaluation based on their own pocketbook evaluation. So, similar to the theory that more pork stimulates the economy and induces voters to choose the incumbent party over the opposition, it can similarly be theorized that citizens will evaluate whether or not to turn out to vote for the incumbent candidate if federal spending stimulated economic activity that increased GDP in their local area. Thus, the hypothesis of this paper from the theory above–although I do not necessarily agree with it–is that citizens who received more presidential pork in their local area will tend to support the candidate of the incumbent party when voting and will tend to turn out more for the candidate of the incumbent party and abstain if they support his opponent, all else being equal.

But how much influence should presidential pork have on citizens decisions on vote choice and turnout? Tip O’Neill once said, “all politics is local.” One interpretation of this statement is that voters ask of their politicians, “what have you done for my community lately?” For congressmen who want to increase their profile with their constituents the answer often involves bringing pork to their district. Political science research has documented this strategic use of public funds for distributive politics (Ferejohn, 1974; Evans, 2004; Cox, 2010; Stokes et al.,

2Although pork might usually be thought of as high-profile projects, political scientists do not have a good operationalization of high-profile. So in the literature (Berry, Burden and Howell, 2010; Kriner and Reeves, 2012, 2015) there is agreement to use federal grants as a measure of presidential pork.
2013). But Americans may not ask this question as much of the President because they are concerned with issues that are of politically salient for all of America: abortion, gay marriage, gun control, taxes and spending, and foreign policy. Thus, we might expect Americans to focus only on national issues and not pay any attention to local concerns about federal spending when evaluating the president and his party. There is a strong reason in the political science literature that would suggest that this is true. Particularly, there is evidence (Abramowitz, 2010b) that Americans are becoming much more partisan and polarized, which would suggest that they are more inclined to weigh only their ideology and party ID and disregard any local benefits the candidate may have brought to their district. As (Dickinson, 2014, p. 426) notes that we have “entered a new, more partisan era of increasingly nationalized politics.” Although he is speaking about Congress, this should also be true for the presidency. So O’Neill may have been correct when he was talking about 1970s congressional politics, but there is reason to doubt that Americans are concerned about pork barrel spending when comes to presidential politics. Thus, the theory that makes more sense—and that I am claiming as my own—is the null hypothesis to the one that I present above: pork has no effect on citizen behavior. Note that my theory agrees more with the behavioral literature such as Adams, Merrill and Grofman (2005) and Jessee (2012), which views vote choice many as a function of a person’s ideology and party ID, rather than the political economy literature of for example Dixit and Londregan (1996) and Cox and McCubbins (1986) which views distributive spending as having some effect on the vote choice of citizens. My research question asks if presidential distributive spending has any effect at all.

In this paper, I will test these theories of how citizens respond to presidential pork. I utilize spending data for federal grants distributed to counties—a measure that is traditionally accepted by the political science literature—for the presidential election years of 2008 and 2012 combined with a large sample survey of American voters. I employ Bayesian Item Response Theory on a set of binary answer (agree/disagree) policy questions to estimate each respondent’s ideology since it is a crucial control variable. I find little to no evidence that voters cast more votes for the incumbent party for sending more presidential pork to their county, as argued by Kriner and Reeves (2012). Since I have data of validated voter turnout for the years 1988 and 2008, I am able to study turnout for those years in great detail. I find mediocre evidence that citizens do
tend to turn out to vote more for the incumbent party when they receive more pork relative to other counties. In particular, supporters of the incumbent party turn out more than supporters of the opposition party, as was the case for Republicans in 2008. However, the magnitude of this effect is not significant enough to conclude that presidential pork is one of the main drivers of voter turnout. Thus, although it seems that the Chen (2012) story of people turning out to vote more for the incumbent’s party has some empirical evidence for how presidential pork influences citizen behavior, my overall theory that Americans today do not pay that much attention to pork would seem correct. My results are very important due to the fact that the results of Kriner and Reeves (2012), Kriner and Reeves (2015), and Chen (2012) are groundbreaking: they are a paradigm shift in the way political scientists view the presidency. Schwartz (1999) notes that while Congress is naturally seen as a body made up of multiple parochial interests serving small geographies, the presidency was designed and traditionally viewed by political science to counterbalance this by looking out for the general welfare of the entire country. So, since he is the only nationally elected official, he should have more global rather than local interests in mind. If their results are true, then the president has more of an incentive to use his office for more parochial interests which goes against the conventional wisdom. But if my theory of presidential pork having minimal effect is true, then the president may have no incentive to play favorites such as people who live in swing states.

2.2 The Theory

An important question that needs theoretical justification is “why should the president be able to have any influence over the distribution of federal grants?” One might argue that since the budget originates and is passed by Congress, the president should have no say for how federal grants are distributed across counties. But Kiewiet and McCubbins (1988) would argue that, even though it is passed by Congress, the president indirectly has a great amount of influence over its construction based on his agenda setting power (he sends Congress a budget plan every year) and his veto power (he can negotiate with Congress about the contents of the budget).

But even if the president has actual influence over the crafting of the budget, how can

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3I do not mean global in the sense of globalization but rather as having the whole country in mind.
regular citizens attribute this type of spending to the president? There are two important ways pork barrel spending is thought to influence the way citizens vote for the incumbent candidate. First is the credit claiming method in which the politician who procured the spending for his district advertises it somehow to the local population—this method is the way that Grimmer (2013) shows how legislators try to ingratiate themselves to their constituents. They do this with their various newsletters and other communiqués that they send out. Kriner and Reeves (2015) provide experimental evidence that shows that, if respondents are informed that the president was responsible for increased transportation spending in their local area, they are more likely to rate the president higher on a feeling thermometer. But it is probably the case that either presidents do not send out these types of newsletters that are targeted at the very local level as congressmen and senators do—at least not at the county level that I am studying in this paper—or that citizens do not pay much attention to them. It could be that members of Congress in the local area advertise the spending in the area to help the candidate of the incumbent party get elected. But Grimmer, Messing and Westwood (2012) provides evidence that members of Congress tend to contest the president’s role in allocating the spending to the local area rather than highlighting his role. The second way in which federal grant spending can be attributed to the president is by increasing the level of spending to such a large extent that it increases the economic activity in the area and thus induced citizens to evaluate the president on an economic retrospective way.  

Besides the individuals who are made happier by being paid directly by the federal money, others will benefit from the additional spending within the local community and, thus by the multiplier effect, will most likely boost the economic activity in the region. Then the pocketbook voting theory implies that these people will reward the incumbent president for giving them a higher income. I want to emphasize the theory of grants having an economic effect on citizens living in the county as a justification for one of my key independent variables: the per capita level of grant spending in a county. I will also use the percentage change of grants from the previous year, which could also be influential. However, I emphasize the absolute level of spending because, in theory, the level of grant spending could originally be a very small level in the initial year and then increase slightly, say from $100 to $200 for the whole county, but we could not think that this amount of money would have a

\footnote{For a review of this literature see Healy and Malhotra (2013)}
very great economic impact. This is why it is important that I study both the absolute level of
government spending and the percentage change in grant spending.

The theory of Kriner and Reeves (2012), Kriner and Reeves (2015), and Chen (2012) is that
presidential pork changes people behavior. My theory is that Americans take into account their
ideology and party ID so much more than presidential pork when making the decision to vote
and turnout to vote that pork should have a negligible effect. Essential to this theory is the
idea that voters measure the distance between their ideal point and each of the candidates ideal
points, as opposed to the Kriner and Reeves (2012) method of just inserting a measure of a
respondent’s ideology as a variable. This taps into a vast literature on spatial voting, but I
will emphasize my use of the model used in Adams, Merrill and Grofman (2005). They use the
average respondent placement of the candidates on a left-right continuum. This method leaves
the process of identifying where each candidate’s ideal point is up to a summary statistic of the
objective opinion of the survey respondents. My measure is to use an objective measure that
puts both respondents and candidates on the same scale.

It is important to note the different theories of how presidential pork influences people:
changing vote choice and the decision to turn out to vote. To help facilitate this understanding,
I expressly state my hypotheses as follows:

**Vote Choice Hypothesis** When a county receives more presidential pork, the people in that
county should be more likely to vote for the candidate of the incumbent party for president.

**Turnout Hypothesis** When a county receives more presidential pork, the people of that
county should be more likely to turn out to vote, particularly for the candidate of the
incumbent party.

**Substantive Hypothesis** The effects of both of these two hypotheses should be substantively
significant.

Table 2.1 helps illuminate this. The Vote Choice Hypothesis states, assuming that a person is
going to turn out to vote, the change in vote choice results in a move from square $R$ to square
$D$. This is the research question of Kriner and Reeves (2012) and Kriner and Reeves (2015).
The Turnout Hypothesis state that, first of all, presidential pork should move people from the
Abstain box to the Turnout box. Of particular interest to the Chen (2012) theory, people who support the Republican candidate (assuming that he is the candidate of the incumbent party) will change their turnout decision resulting in a move from square $R'$ to $R$ and will cause—although perhaps not as much—people who support the Democratic candidate to change from $D'$ to $D$.

2.3 Data and Operationalizations

I combine data from the Cooperative Congressional Election Study (CCES), the American National Election Study (ANES), the Consolidated Federal Funds Report (CFFR), USAspending.gov, and the Census Bureau. The CCES and ANES provide data on individual survey respondents, the CFFR provides information on the federal government’s spending on federal grants for 2007 and 2008, USAspending.gov provides information on the federal government’s spending on federal grants for 2011 and 2012, and the Census Bureau provides data on population and other demographic and geographic variables.

2.3.1 Presidential Pork

For this paper, I will define presidential pork as the dollar amount of grant spending within a particular county. The previous literature has defined it in this way—see Berry, Burden and Howell (2010) and Kriner and Reeves (2012). I will also adopt it for a good reason: federal grants are highly susceptible to manipulation from year to year by political actors (Congress and the president) as opposed to something like procurement spending. There are, of course, issues with this measure because the government spends much more money in many other ways. But, until a better measure can be invented, this is the best one available at the moment.
Note that presidential pork is measured in two ways. First, the percentage change of grant spending from the previous year, which I denote as $\Delta g_{it}$. Second, the total per capita amount of grant spending in a person’s local area (this will be logged to make the variable more like the Normal distribution), which I denote as $\log(g_{it})$. I obtain this from the Consolidated Federal Funds Report (CFFR) provided by the U.S. Census Bureau.\(^5\) I aggregate all of the non-negative spending (federal transfers only and not liabilities) for each county in the US. I eliminate those values of $\Delta g_{it}$ which are over 2.5 (a 250% increase) so that the likelihood function will not be skewed by these data points, which results in a loss of 14 respondents being eliminated from the data set.\(^6\) While grants are normally distributed, the change in grants is very skewed even, after eliminating the extreme outliers. I also collect data on the per capita grant spending and percentage change in grant spending for the years 2011 and 2012 through USAspending.gov. We can see that the histograms of $\log(g_{it})$ for 2008 and 2012 have a Gaussian distribution as seen in Figures 2.3 and 2.5 respectively. Throughout this paper, I will refer to a standard change, which will be a change in the distribution from the 25% mark to the 75% mark of the distribution for either $\Delta g_{it}$ or $\log(g_{it})$. A standard change in $\log(g_{it})$ is a change from 6.73 to 7.66 in the year 2008 and a change from 4.08 to 6.11 in the year 2012. The histograms for $\Delta g_{it}$ look less Gaussian—as seen in Figures 2.4 and 2.6—but still close enough to use the variables without any transformation. A standard change for $\Delta g_{it}$ is from -0.207 to 0.265 in the year 2008 and from -0.191 to 0.15 for the year 2012.

A local area for an individual is defined as the county in which she lives. This is a very small yet significant area of spending that would be significant for determining how much the federal government is spending in grants in that person’s local area. The whole state as a unit of analysis would be too large of an area for places California and Texas. And a zip code area would most likely be too small, since, for example, people often live in one zip code and work in another. So it would not reflect the other areas of a person’s community that would be receiving federal funding other than the exact place where his house is. Finally, the reason

\(^5\)Because the Census Bureau does not calculate the amount of spending in New York for Bronx, King, Queens, and Richmond counties but rather gives a combined level of spending for this area, I aggregate the total population for these counties to get the per capita level of grant spending in this area.

\(^6\)This is after I have already eliminated the respondents who did not turn out to vote and other relevant NA’s in the dataset.
why it is crucial to use the county as the unit of analysis is because the vast amount (96.4% in the year 2008) of the federal grant spending distributed to the states can be placed within a county (the rest is labeled as “state undistributed”), as opposed to only 32.8% that can be placed within a congressional district by the CFFR in that same year.\(^7\)

2.3.2 Ideology

I estimate the ideal points of the 2008 CCES respondents. In the survey, respondents were asked to say if they agree or disagree with a particular bill that came up as a roll call vote in either the House, the Senate, or both for a total of 9 bills that were included in the survey. This allows me to use Clinton, Jackman and Rivers (2004) as methodology to estimate the ideal point of each respondent using Bayesian Item Response Theory.\(^8\) I include only respondents that had 4 or more responses that were not NA. This leaves a total of 32,146 respondents who’s ideal points I estimated. Furthermore, I use only those respondents who have validated voting record and who explicitly expressed that they voted for either one of the two-major-party presidential candidates. I limit the response items to the 9 that were in the survey to have congruence between the survey respondents and the presidential candidates who voted on a majority of the bills. It is important to note that the CCES has an unrepresentative sample of the American population in 2008. For example, the CCES has a 50% vote share for John McCain when in the actual election he has a 46% vote share (only counting the McCain-Obama votes).

I also estimate the respondent ideal points for the 2012 CCES data, which includes many more survey respondent. Since neither of the candidates voted on the binary response items provided by the CCES, I include many more response items. This makes the ideal point estimation much more computationally difficult, so I use an EM algorithm provided by Imai, Lo and Olmsted (2015) since the dataset of respondents is quite large and takes up much computational time. I also use a larger set of binary responses since neither of the candidates were members of

---

\(^7\)For example, in 2008 in the state of Indiana, the federal government spent $4,890,051,912 in federal grants specifically in a county such that the CFFR can report it as such as opposed to as opposed to $212,459,102 which is labeled as “state undistributed” (and is only 4.3% of the amount which can be placed in a county).

\(^8\)I compute 10,000 draws for each respondent and then thin out by 10, thus saving 1,000. I then take the mean of the distribution as the estimated ideal point for the respondent.
Congress, and thus there is no way to objectively find the presidential candidate’s ideal points. Furthermore, for the year 1988, the ANES has feeling thermometers for the candidates and other groups in society. Since there are not any item responses that the candidates had voted on before the election year that are represented in the survey, I use the multidimensional scaling method developed by Poole and Rosenthal (1984). This estimates both the respondent and the candidate ideal points (Bush and Dukakis were one of the stimuli for the feeling thermometers).

2.3.3 Voter Turnout

The CCES for 2008 has a validated voter turnout variable which I am able to use to study the effect of pork on turnout for that election year. The 2012 CCES does not, so I am not able to study the effect on turnout with the amount of certainty that I have for the year 2008. This is because survey respondents tend to overstate their level of turnout. The ANES also has validated voter turnout for the year 1988, so I am also able to study voter turnout for that year as well.

2.4 Presidential Pork’s Influence on Vote Choice

In this section, I evaluate the results for the Vote Choice Hypothesis: among the set of people who decided to vote, presidential pork induces voters to choose the candidate of the incumbent party. There are two ways to go about the research design of this question which handle the respondent’s ideology differently: the probit model and the conditional logit model.

2.4.1 The Probit Model

One method is to model the ideology of each respondent as a variable within the voter’s decision.\textsuperscript{9} Let \(q_i\) represent the ideology of respondent \(i\), \(\text{Dem}_i\) be an indicator function of whether or not \(i\) identifies as a Democrat, \(\text{Rep}_i\) be an indicator function representing whether or not \(i\) is a Republican. Define the percentage change in grants as \(\Delta g_{it} = \frac{g_{it} - g_{it-1}}{g_{it-1}}\) where \(g_{it}\) stands for the

\textsuperscript{9}Although a logit model could also be used just as easily. I use a probit model since that is what Kriner and Reeves (2012) use in their statistical setup.
level of per capita grant spending for the county of respondent \( i \) in year \( t \). Then the specification in Kriner and Reeves (2012) is given by

\[
\Pr [Y_i = r | X_i] = \Phi (\beta_0 + \beta_1 q_i + \beta_2 \text{Rep}_i + \beta_3 \text{Dem}_i \\
+ \beta_4 \log (g_{it}) + \beta_5 \Delta g_{it} + \tilde{\beta} Z_i)
\]

where \( Y_i \) is the vote choice of respondent \( i \), \( X_i \) is the data for \( i \), \( Z_{ij} \) is a vector of control variables with corresponding coefficient vector \( \tilde{\beta} \), and \( r \) in this case stands for George H.W. Bush, John McCain, or Mitt Romney. In this paper, the Republican candidate will always be equal to 1. The control variables can also include state fixed effects.

Thus, if this theory is correct and voters a very responsive to pork from the federal government, then we would expect the data to show that the candidates of the incumbent president’s party receive a boost to the utility of the voters in counties where either the federal government spends more in that county in absolute terms or if the federal government has increased its spending during the election year. Thus, the Vote Choice Hypothesis suggests that the coefficients for both \( \log (g_{it}) \) and \( \Delta g_{it} \)–which are \( \beta_4 \) and \( \beta_4 \) respectively in Equation 2.1–should be positive in the year 2008 and negative in the year 2012 and both statistically and substantively significant if the theory is correct.

Table 2.2 is my close analog of Table 5 in Kriner and Reeves (2012) with the spending data at the county level minus a few control variables that were not statistically significant. Their coefficients for the percentage change in grant spending is statistically significant and relatively large in its substantive effect. A two standard-deviation change in grants (they use a different measure of change than I do) in their model leads to an increase in the predicted probability of voting for McCain from 82% to 92% if the respondent is a Republican and from 4% to 11% if the respondent is a Democrat. Although this is not necessarily a huge swing, it is enough that the incumbent president would want to use his power of distributing federal grants in such a way that would persuade voters who are on or near the fence towards his party’s candidate. However, my results show that the coefficient is statistically insignificant and very small when I replicate their model directly. For example, if we look at Model 1 in Table 2.2, we can see the substantive change in the predicted probability of voting for the candidate of the incumbent president. My baseline person is a white, male living in Ohio (this is to give a state fixed effects constant). Remember that, instead of using a two standard deviation increase in \( \Delta g_{it} \)
Table 2.2: Probit Regression with only ideology and only the change in grants variable.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.909***</td>
<td>0.909***</td>
<td>0.921***</td>
</tr>
<tr>
<td></td>
<td>(0.162)</td>
<td>(0.163)</td>
<td>(0.162)</td>
</tr>
<tr>
<td>republican</td>
<td>1.240***</td>
<td>1.245***</td>
<td>1.240***</td>
</tr>
<tr>
<td></td>
<td>(0.053)</td>
<td>(0.053)</td>
<td>(0.053)</td>
</tr>
<tr>
<td>democrat</td>
<td>−0.806***</td>
<td>−0.806***</td>
<td>−0.807***</td>
</tr>
<tr>
<td></td>
<td>(0.048)</td>
<td>(0.048)</td>
<td>(0.049)</td>
</tr>
<tr>
<td>ideology</td>
<td>1.781***</td>
<td>1.782***</td>
<td>1.794***</td>
</tr>
<tr>
<td></td>
<td>(0.048)</td>
<td>(0.048)</td>
<td>(0.048)</td>
</tr>
<tr>
<td>△grants</td>
<td>0.034</td>
<td>0.056</td>
<td>0.010</td>
</tr>
<tr>
<td></td>
<td>(0.061)</td>
<td>(0.068)</td>
<td>(0.058)</td>
</tr>
<tr>
<td>republican×△grants</td>
<td>−0.101</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.125)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ideology×△grants</td>
<td></td>
<td>−0.175</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.112)</td>
<td></td>
</tr>
</tbody>
</table>

N 18431 18431 18431
Log Like -3634.45 -3635.15 -3632.6
AIC 7268.9 7270.3 7265.2

Dep var: McCain vote = 1

***p < 0.001, **p < 0.01, *p < 0.05
Table 2.3: Probit regression with the log of total grant spending per capita for the 2008 election.

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>1.707***</td>
<td>1.764***</td>
<td>1.687***</td>
</tr>
<tr>
<td></td>
<td>(0.346)</td>
<td>(0.337)</td>
<td>(0.351)</td>
</tr>
<tr>
<td>republican</td>
<td>1.234***</td>
<td>1.234***</td>
<td>1.234***</td>
</tr>
<tr>
<td></td>
<td>(0.052)</td>
<td>(0.052)</td>
<td>(0.052)</td>
</tr>
<tr>
<td>democrat</td>
<td>-0.807***</td>
<td>-0.807***</td>
<td>-0.807***</td>
</tr>
<tr>
<td></td>
<td>(0.048)</td>
<td>(0.049)</td>
<td>(0.048)</td>
</tr>
<tr>
<td>ideology</td>
<td>1.780***</td>
<td>2.283***</td>
<td>1.780***</td>
</tr>
<tr>
<td></td>
<td>(0.048)</td>
<td>(0.459)</td>
<td>(0.048)</td>
</tr>
<tr>
<td>( \triangle )grants</td>
<td>0.163*</td>
<td>0.160*</td>
<td>-0.046</td>
</tr>
<tr>
<td></td>
<td>(0.083)</td>
<td>(0.081)</td>
<td>(0.551)</td>
</tr>
<tr>
<td>( \log(\text{grants}) )</td>
<td>-0.110**</td>
<td>-0.118**</td>
<td>-0.108*</td>
</tr>
<tr>
<td></td>
<td>(0.042)</td>
<td>(0.041)</td>
<td>(0.043)</td>
</tr>
<tr>
<td>ideology( \times ) ( \log(\text{grants}) )</td>
<td>-0.070</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.064)</td>
</tr>
<tr>
<td>( \triangle )grants( \times ) ( \log(\text{grants}) )</td>
<td></td>
<td></td>
<td>0.028</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.073)</td>
</tr>
<tr>
<td>N</td>
<td>18431</td>
<td>18431</td>
<td>18431</td>
</tr>
<tr>
<td>Log Like</td>
<td>-3631.1</td>
<td>-3630.95</td>
<td>-3632.05</td>
</tr>
<tr>
<td>AIC</td>
<td>7262.2</td>
<td>7261.9</td>
<td>7264.1</td>
</tr>
</tbody>
</table>

Dep var: McCain vote = 1.

***p < 0.001, **p < 0.01, *p < 0.05
Table 2.4: Probit Regression with the log of total grant spending per capita and the percentage change in grants for the 2012 presidential election.

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>-0.020</td>
<td>0.132</td>
<td>0.101</td>
</tr>
<tr>
<td></td>
<td>(0.268)</td>
<td>(0.308)</td>
<td>(0.307)</td>
</tr>
<tr>
<td>republican</td>
<td>2.661***</td>
<td>2.661***</td>
<td>2.660***</td>
</tr>
<tr>
<td></td>
<td>(0.096)</td>
<td>(0.096)</td>
<td>(0.095)</td>
</tr>
<tr>
<td>democrat</td>
<td>-1.482***</td>
<td>-1.482***</td>
<td>-1.486***</td>
</tr>
<tr>
<td></td>
<td>(0.097)</td>
<td>(0.097)</td>
<td>(0.097)</td>
</tr>
<tr>
<td>ideology</td>
<td>2.861***</td>
<td>2.856***</td>
<td>2.855***</td>
</tr>
<tr>
<td></td>
<td>(0.073)</td>
<td>(0.073)</td>
<td>(0.073)</td>
</tr>
<tr>
<td>△grants</td>
<td>-0.095</td>
<td>-0.079</td>
<td>-0.442</td>
</tr>
<tr>
<td></td>
<td>(0.089)</td>
<td>(0.092)</td>
<td>(0.295)</td>
</tr>
<tr>
<td>log(grants)</td>
<td>-0.029</td>
<td>-0.025</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.027)</td>
<td>(0.027)</td>
<td></td>
</tr>
<tr>
<td>log(grants) × △grants</td>
<td></td>
<td></td>
<td>0.089</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.062)</td>
</tr>
</tbody>
</table>

N                      | 30534   | 30534   | 30534   |
Log Like                | -6749   | -6747   | -6744.5 |
AIC                    | 13498   | 13494   | 13489   |

Dep var: McCain vote = 1

***p < 0.001, **p < 0.01, *p < 0.05
as Kriner and Reeves (2012), I use an increase from the 25% mark (the first quartile) of the distribution to the 75% mark (the third quartile) which is my standard measure of change. Thus, standard change in the percentage change of grant spending results in a predicted probability of a white, male Republican living in Ohio moving from a probability of voting for McCain of 82.05% to 82.11% while the same type of person but who identifies as a Democrat moves from a predicted probability of 60.07% to 60.27%. Finally, an independent—the person who the incumbent president is most likely trying to persuade—changes from a predicted probability of 71.16% to 71.36%. Thus, there is no substantively significant change in the predicted probability for this type of person for either of the party identifiers or of independents. Furthermore, the coefficients are not statistically significant with a very large survey sample, further adding to the skepticism that there is no effect.

One variable is conspicuously left out of their equation: the total per capita level of spending for the county. One would think that, in addition to how much the level of per capita grant money has changed since the last year before the election, citizens would certainly notice the overall level as being important. Table 2.3 shows the logit regression results when I add this crucial variable to the equation. For example, in Model 1 in Table 2.3 a standard distance in $\Delta g_{it}$ results for a person who has an average ideology and is a white, male, Republican identifier living in Ohio changes the predicted probability of voting for McCain from a 82.04% to 82.1% predicted probability, and a person who is a democrat from a 60.04% to a 60.23% predicted probability, and a person who is an independent form a 71.14% to a 71.36% predicted probability—all of which of course are substantively negligible. So it is hardly feasible to argue that the percentage change in grant spending can greatly influence the voter’s decision. Moreover, the coefficient for $\Delta g_{it}$ is not statistically significant, with a 95% confidence interval ranging from -0.086 to 0.153. What is even more interesting is the fact that the coefficient for the total per capita level of spending is negative, which means that voters are less likely to vote for McCain (the candidate of the incumbent president’s party) than for Obama if they received more per capita grant spending. This goes in the opposite direction of the theory that I laid out above. If president Bush would want to influence the election for the Republican candidate, he would need to spend less and not more in counties where he needed to gain swing votes for the Republican party. For Model 4 in Table, notice that the coefficient for $\log(g_{it})$ is statistically significant and much larger than
in the regression without the log of per capita grants, but it is still somewhat small. A standard change in log (\(g_{it}\)) increases the chances of a Republican identifier of voting for McCain from a 82.29% to a 81.88% predicted probability, and Democratic identifier from a 60.91% to a 59.6% predicted probability, and an independent from a 72.08% to a 70.68% predicted probability. The changes in predicted probability for the Democratic identifier and the independent seem a little more significant since they are an increase of -1.29631% and -1.40159% respectively, which—although they are significantly greater than the one for the Republican identifier—is still much smaller than the predicted probability in Kriner and Reeves (2012). I also add an interaction between the log of grants and the change in grants, which is neither significant nor large.

Furthermore, when I analyze the 2012 data, I find even less evidence for the Vote Choice Hypothesis. In Model 1 in Table 2.4, the coefficient for \(\Delta g_{it}\) is negative, indicating that respondents who experienced a decrease in the percentage change of grant spending were less likely to vote for Romney as a result, and remember that Obama is the incumbent president so negative coefficients mean that pork may have an effect. For a person who is an independent, white person living in Ohio with an average income, a standard change in \(\Delta g_{it}\) will decrease the probability of voting for Romney from 59.32% to 59.14%, which is hardly anything. For Model 2 in Table 2.4, a person of the same type above who is an independent who has a change in the percentage change of grant spending from the 25% mark to the 75% mark of the distribution for \(\Delta g_{it}\) will decrease from a 59.3% to a 59.15% predicted probability for voting for Romney. And again, the coefficient for \(\Delta g_{it}\) is statistically insignificant with a large survey sample. Also for Model 2 in Table 2.4, a change from the 25% mark to the 75% mark of the distribution of log (\(g_{it}\)) will decrease the probability of of voting for Romney from 59.39 to 59.06%. Thus, it seems in summary that the effects of both \(\Delta g_{it}\) and log (\(g_{it}\)) are substantively negligible and statistically insignificant. I also find that swing states and the respondents having a member who is a co-partisan with the president is also not significant for the year 2008 in changing people’s vote choice.\(^{10}\)

\(^{10}\)This discussion is left in the Supplementary Information since it contains no significant new information.
2.4.2 The Conditional Logit Model

A more theoretically informed way to evaluate the Vote Choice Hypothesis, which is my addition to this line of research, is to use the model specification used by Adams, Merrill and Grofman (2005) and Jessee (2012) which is to model a voter’s choice of candidate by his spatial distance to each candidate. I assume that a citizen’s level of satisfaction for a candidate consists of three factors: the spatial (Euclidean) distance between himself and the candidate, whether or not he identifies with the candidate’s party, and valence that the candidate has. The ideological distance between a citizen and a candidate is well documented factor in influencing a person’s vote choice—see for example Adams, Merrill and Grofman (2005), Jessee (2012). Furthermore, party identification is also a well accepted factor in a person’s vote choice (Green, Palmquist and Shickler, 2002). Although Democratic party identifiers are on average more liberal than Republican ones, there are nevertheless some Republican identifiers who are more liberal than Democrat ones. Thus, ideology and party ID are two distinct aspects of a person’s utility for a candidate. This aspect is captured by Adams, Merrill and Grofman (2005), who construct a unified model of both ideological distance from the candidate and a party ID component. However, despite these important factors, there are still other systematic components that influence a voter’s choice which political scientists generally categorize under the concept of valence. Although valence can come in many different forms, candidate visits, TV ads, the concept I want to study here is whether or not more federal spending gives the incumbent’s party candidate a valence boost.

I conjecture that a person who has the same ideal point and the same party identification as a person in another county, but received a higher level of federal spending in his county, he should view the incumbent president more favorably because the federal government is doing more for people in that area than the other person in another county which does not receive as much federal spending. This should induce the person to who received more spending to have a higher probability of voting for the candidate of the incumbent president’s party. This can happen in two main ways. First, the county can receive a much larger amount of federal spending in per capita terms than the other counties. Second, even if the county receives very little from the federal government, if the government has increased its amount of spending from previous years, then voters might take notice and attribute this to the president’s party.
Suppose that there are only two candidates running for office: \( r \) and \( d \) (the Republican and Democratic candidates respectively). There is a single dimensional ideological policy space. Each candidate must choose a policy position, \( s_k \), along the policy space as his platform. Each voter, \( i \), has an ideal point, \( q_i \). Also, each voter either identifies with particular party or is an independent. If the voter identifies with the party of candidate \( r \), then his utility is increased by amount \( \beta_2 > 0 \)—the same is true if respondent \( i \) identifies with the party of candidate \( r \) but \( i \) can only have one party identification. To put this into the utility function, let \( b_{ik} \) be an indicator function that indicates if respondent \( i \) identifies with candidate \( k \)’s party. Combining all of this together, following Adams, Merrill and Grofman (2005) and then adding the model used by Stokes et al. (2013) each voter has a utility function for the Republican candidate, \( r \), constructed as

\[
U_i(r) = -\beta_1 (q_i - s_r)^2 + \beta_2 b_{ir} + \beta_3 \log (g_{it}) + \beta_4 \Delta g_{it} + \tilde{\beta} Z_i + \varepsilon_{ir} \tag{2.2}
\]

where \( \varepsilon_{ik} \) is a stochastic component that is distributed Type I Extreme Value. It is safe to assume that all voters vote sincerely because, in my model, there are only two candidates running for office. Here \( g_{it} \) is only in the Republican candidate’s equation and the amount is zero in the Democratic candidate’s equation.\(^\text{11}\) This is crucial for the construction of the structural model developed by Adams, Merrill and Grofman (2005) which I use in my estimation strategy. Using the logic that is found in Train (2009), the probability of voter \( i \) voting for candidate \( r \) over \( d \) is given by

\[
\Pr [U_i(r) > U_i(d)] = \Pr [V_i(r) - V_i(d) + \varepsilon_{id} > \varepsilon_{ir}] \tag{2.3}
\]

I then derive the probability that respondent \( i \) will vote for candidate \( r \):

\[
P_{ir} = \frac{e^{V_i(r)}}{e^{V_i(r)} + e^{V_i(d)}} \tag{2.4}
\]

Define \( y_{ir} \) as 1 if voter \( i \) voted for candidate \( r \) and 0 otherwise. The likelihood function for the conditional logit model is expressed as

\[
L(\beta | X, y, s) = \Pi_i (P_{ir})^{y_{ir}} (P_{id})^{y_{id}} \tag{2.5}
\]

\(^\text{11}\)This is so that in Equation 2.3, the terms do not cancel each other out. This also includes all of the control variables. Thus, the Democratic would be \( U_i(d) = \beta_1 (q_i - s_d)^2 + \beta_2 b_{id} + \varepsilon_{id} \).
where $X$ is a vector of covariates for the independent variables that contain the individual ideal points, party identifications, spending levels for each respondent and $s$ represents the candidate positions. Thus, the Vote Choice Hypothesis suggests that the coefficients for both $\log(g_{it})$ and $\Delta g_{it}$—which are $\beta_3$ and $\beta_4$ in Equation 2.5—should be positive in the year 2008 and negative in the year 2012 and both statistically and substantively significant if the theory is correct.

Table 2.5: Conditional logit Regression for relative distance to the candidates for the 2008 presidential election.

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>spatial distance</td>
<td>2.317***</td>
<td>2.331***</td>
<td>2.331***</td>
</tr>
<tr>
<td></td>
<td>(0.064)</td>
<td>(0.059)</td>
<td>(0.053)</td>
</tr>
<tr>
<td>party ID</td>
<td>1.740***</td>
<td>1.702***</td>
<td>1.702***</td>
</tr>
<tr>
<td></td>
<td>(0.052)</td>
<td>(0.062)</td>
<td>(0.049)</td>
</tr>
<tr>
<td>$\Delta$grants</td>
<td>-0.195</td>
<td>0.010</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.745)</td>
<td>(0.162)</td>
<td></td>
</tr>
<tr>
<td>$\log$(grants)</td>
<td></td>
<td>-0.111***</td>
<td>-0.111***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.019)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>white</td>
<td>-0.293***</td>
<td>0.326*</td>
<td>0.329*</td>
</tr>
<tr>
<td></td>
<td>(0.066)</td>
<td>(0.127)</td>
<td>(0.129)</td>
</tr>
<tr>
<td>black</td>
<td>-3.233***</td>
<td>-2.620***</td>
<td>-2.615***</td>
</tr>
<tr>
<td></td>
<td>(0.258)</td>
<td>(0.291)</td>
<td>(0.307)</td>
</tr>
<tr>
<td>income</td>
<td>-0.080***</td>
<td>-0.055***</td>
<td>-0.055***</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.011)</td>
<td>(0.010)</td>
</tr>
<tr>
<td>N</td>
<td>18,897</td>
<td>18,897</td>
<td>18,897</td>
</tr>
<tr>
<td>Log Like</td>
<td>-3,296.751</td>
<td>-3,272.392</td>
<td>-3,271.999</td>
</tr>
<tr>
<td>AIC</td>
<td>6,593.501</td>
<td>6,544.783</td>
<td>6,543.999</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses.

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$

When I use the model in Equation 2.5, with relative distance to the candidates, the results
confirm what I found for the coefficients for log \( g_{it} \) in the model in Equation 2.1 (it is statistically significant for Model 2 but not for Model 3). Furthermore, in Table 2.5, we see that the coefficient for \( \Delta g_{it} \) is negative for all model variations and only statistically significant for some. Here, though, both the log of per capita spending and the percentage change in spending are very small compared to the coefficients for the spatial distance and party ID. Since this relative distance model is the most accurate according to the literature on voting models, we should take these results the most seriously. Naturally, from this, it seems that more presidential pork does not help the incumbent candidate. The fact that the coefficients for log \( g_{it} \) keep showing up as negative and sometimes statistically significant is interesting. Since it is supporting Barack Obama in both results of Equations 2.1 and 2.5 and for both 2008 and 2012 in Tables 2.3 and 2.4 suggest that the Democrats receive a more support where the federal government spends more money in per capita grants. This could be a case of issue ownership for the Democrats on government spending.

2.5 Presidential Pork’s Influence on Turnout

In this section, I evaluate the results for the Turnout Hypothesis: that presidential pork increases the likelihood that a person who supports the candidate of the incumbent party turns out to vote for him and decreases the likelihood that a person who opposes him turns out to vote.\(^\text{12}\) One way to investigate this is to separate the data between McCain voters and Obama voters and run the same probit regressions with turnout as the dependent variable and both the log \( g_{it} \) and \( \Delta g_{it} \) variables with the other control variables that I use in the previous regressions.\(^\text{13}\) I am able to do this because the CCES and ANES asks respondents who they voted for in the presidential election or who they would have voted for if they did not vote. So, assuming that

\(^{12}\)Remember that Chen (2012) provides evidence that FEMA hurricane disaster relief increases voter turnout if the citizens in the affected area identify with the same political party as the political party in power while discouraging citizens who identify with the other party.

\(^{13}\)See the section in the Appendix “Does Presidential Pork Influence Turnout in General?” for a discussion of how pork influences turnout regardless of who the person supports. There is minimal evidence that people turn out to vote if the federal government increases the level of grant spending in their county, but do citizens reward the candidate of the incumbent party by turning out to vote more?
the respondents are giving a truthful answer to the question, we can observe the counterfactual in this case. Then the equation of interest is

\[
\Pr[Y_i = t | X_i] = \Phi (\beta_0 + \beta_1 q_i + \beta_2 \text{Rep}_i + \beta_3 \text{Dem}_i \\
+ \beta_4 \log (g_{it}) + \beta_5 \Delta g_{it} + \tilde{\beta} Z_i)
\]

where \( t \) is equal to 1 if person \( i \) turned out to vote or not. I put \( |q_i| \) in to control for how politically extreme the respondent is on either side of the political spectrum. This is because I theorize that more political extreme individuals will be more likely to turn out to vote. I run this probit regression for both the McCain supporter dataset and the Obama supporter dataset. The Turnout Hypothesis suggests that supporters of the candidate of the incumbent party will be more likely to turn out to vote, thus \( \beta_4 \) and \( \beta_5 \) should be positive for the subset of data of respondents who support the incumbent candidate in Equation 2.6, and people who oppose him will be less likely to turn out to vote, thus \( \beta_4 \) and \( \beta_5 \) should be negative for the subset of data of respondents who oppose him. It is more likely that presidential pork has a turnout effect for the incumbent candidates supporters rather than an abstention effect for his opponents, so it is more likely that the coefficients for his supporters be positive and significant rather than the coefficients for his opponents be negative and significant.

Table 2.6 shows the results of Equation 2.6 for both the McCain and Obama supporter datasets. The Republican coefficient for \( \log (g_{it}) \) is statistically significant while it is not for the Democratic one. Moreover, contrary to the theory, the coefficients for the Obama voters are positive, meaning presidential pork increases the probability of turning out to vote. But at least the coefficient for \( \log (g_{it}) \) is also slightly larger for the Republican regression than the Democratic one. For Model 1 in Table 2.6, a standard change of \( \log (g_{it}) \) changes the predicted probability of a Republican party identifier who supports McCain of turning out to vote from 76.72% to 77.67% and an independent from 73.68% to 74.84%. For Model 2 in Table 2.6, a standard change increases the predicted probability of Democratic party identifiers who support Obama from 75.61% to 76.29% and an independent from 73.06% to 73.84%. But for the year 1988 as represented in Table 2.7, none of the coefficients are statistically significant. Thus, it seems that the Chen (2012) hypothesis that citizens reward incumbent president’s by either

\[14\] Note that in Table 2.6 very similar results as in Table 2.14 in the Appendix.
Table 2.6: Probit regression with the data split into those respondents who voted for McCain and those who voted for Obama.

<table>
<thead>
<tr>
<th></th>
<th>McCain</th>
<th>Obama</th>
<th>McCain</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>-0.974*</td>
<td>-1.020**</td>
<td>-0.588</td>
</tr>
<tr>
<td></td>
<td>(0.340)</td>
<td>(0.373)</td>
<td>(0.385)</td>
</tr>
<tr>
<td>republican</td>
<td>0.271***</td>
<td>0.155</td>
<td>0.270***</td>
</tr>
<tr>
<td></td>
<td>(0.033)</td>
<td>(0.081)</td>
<td>(0.033)</td>
</tr>
<tr>
<td>democrat</td>
<td>0.078</td>
<td>0.216***</td>
<td>0.079</td>
</tr>
<tr>
<td></td>
<td>(0.068)</td>
<td>(0.036)</td>
<td>(0.068)</td>
</tr>
<tr>
<td>△grants</td>
<td>-0.119</td>
<td>-0.002</td>
<td>-0.130</td>
</tr>
<tr>
<td></td>
<td>(0.073)</td>
<td>(0.080)</td>
<td>(0.073)</td>
</tr>
<tr>
<td></td>
<td>ideology</td>
<td></td>
<td>0.248***</td>
</tr>
<tr>
<td></td>
<td>(0.030)</td>
<td>(0.039)</td>
<td>(0.030)</td>
</tr>
<tr>
<td>log(grants)</td>
<td>0.104*</td>
<td>0.067</td>
<td>0.050</td>
</tr>
<tr>
<td></td>
<td>(0.045)</td>
<td>(0.051)</td>
<td>(0.051)</td>
</tr>
<tr>
<td>swing</td>
<td>-0.097*</td>
<td>-0.067</td>
<td>-0.094*</td>
</tr>
<tr>
<td></td>
<td>(0.047)</td>
<td>(0.052)</td>
<td>(0.046)</td>
</tr>
<tr>
<td>house</td>
<td></td>
<td></td>
<td>-0.749</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.416)</td>
</tr>
<tr>
<td>log(grants)×house</td>
<td></td>
<td></td>
<td>0.107</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.058)</td>
</tr>
<tr>
<td>N</td>
<td>12641</td>
<td>12699</td>
<td>12641</td>
</tr>
<tr>
<td>Log Like</td>
<td>-7822</td>
<td>-9433</td>
<td>-7816</td>
</tr>
<tr>
<td>AIC</td>
<td>15671.4</td>
<td>18893.9</td>
<td>15663.2</td>
</tr>
</tbody>
</table>

Dep var: turnout = 1

***p < 0.001, **p < 0.01, *p < 0.05
Table 2.7: Probit with the data split by Bush and Dukakis voters for 1988.

<table>
<thead>
<tr>
<th></th>
<th>Bush</th>
<th>Bush</th>
<th>Bush</th>
<th>Dukakis</th>
<th>Dukakis</th>
<th>Dukakis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(0.416)</td>
<td>(1.435)</td>
<td>(1.460)</td>
<td>(0.415)</td>
<td>(1.370)</td>
<td>(1.299)</td>
</tr>
<tr>
<td>ideology</td>
<td>0.023**</td>
<td>0.023**</td>
<td>0.023**</td>
<td>0.022**</td>
<td>0.022**</td>
<td>0.022**</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.008)</td>
<td>(0.008)</td>
<td>(0.007)</td>
<td>(0.007)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>democrat</td>
<td>0.057</td>
<td>0.048</td>
<td>0.049</td>
<td>0.007</td>
<td>0.003</td>
<td>-0.003</td>
</tr>
<tr>
<td></td>
<td>(0.314)</td>
<td>(0.318)</td>
<td>(0.318)</td>
<td>(0.179)</td>
<td>(0.179)</td>
<td>(0.180)</td>
</tr>
<tr>
<td>republican</td>
<td>0.311</td>
<td>0.299</td>
<td>0.298</td>
<td>0.207</td>
<td>0.195</td>
<td>0.205</td>
</tr>
<tr>
<td></td>
<td>(0.175)</td>
<td>(0.180)</td>
<td>(0.180)</td>
<td>(0.514)</td>
<td>(0.510)</td>
<td>(0.520)</td>
</tr>
<tr>
<td>△grants</td>
<td>-0.158</td>
<td>-0.141</td>
<td>0.496</td>
<td>0.459</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.334)</td>
<td>(0.351)</td>
<td>(0.665)</td>
<td>(0.632)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(grants)</td>
<td>-0.093</td>
<td>-0.085</td>
<td>0.149</td>
<td>0.130</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.217)</td>
<td>(0.224)</td>
<td>(0.224)</td>
<td>(0.206)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>822</td>
<td>822</td>
<td>822</td>
<td>712</td>
<td>712</td>
<td>1712</td>
</tr>
<tr>
<td>AIC</td>
<td>865.8773</td>
<td>865.8194</td>
<td>867.579</td>
<td>775.4411</td>
<td>776.0844</td>
<td>776.7411</td>
</tr>
</tbody>
</table>

Dep var: turnout = 1
turning out to vote more if they support the candidate the same party as the incumbent or to abstain from voting against the incumbent candidate’s party if they support the opposition party does have some evidence in this analysis. However, we would certainly not consider this a very large effect on turnout.

2.6 Conclusion

I began with the hypothesis that Americans are responsive to presidential pork due to the possibility that it might increase economic activity in the local area which will induce people to vote retrospectively in favor for the incumbent candidate and also to induce his supporters to turn out to vote. However, I also gave a theoretical reason to doubt that the data would confirm this hypothesis: people do not care about presidential pork barrel projects or the money that it brings to their pockets especially when they care so much more about having a candidate that is closer to them ideologically and having the same party ID as they do. In all of the empirical analysis done, the percentage change in grant spending is either statistically insignificant or it is too small to make any real difference in how citizens vote for the candidate of the incumbent president’s party. These results are especially strong when I only include swing states in the statistical analysis.

I do find some evidence that voters respond to the per capita dollar amount of grant spending, but it is also borderline statistically significant and always substantively insignificant. Moreover, the coefficient is in the opposite direction that we would expect: voters who received a higher level of per capita grant spending were more likely to vote for Barack Obama, who is not the candidate of the incumbent party. This may be because Obama is a Democrat and they tend to support more government spending programs. So Democratic candidates may have issue ownership over government spending, but that is a topic for another paper. Furthermore, there is some evidence that increasing the per capita dollar amount of grant spending in a county will increase the probability of turnout amongst the population, particularly turnout for the candidate of the incumbent party. So it may be that American citizens respond to presidential pork after all, it was just not the way as was previously reported by Kriner and Reeves (2012)–that the effect is for turnout and not the voter’s support for the president at the polls.
My paper somewhat supports the results found by Chen (2012): although there is no evidence that presidential pork decreases people who oppose the candidate of the incumbent party to turn out to vote, it does slightly increase the probability that people who support him turn out to vote. But this effect is not substantively significant and it is only significant for the year 2008 and not 1988. We might expect this difference because Chen studies people’s propensity to turn out based on how they interact with the government based on filling out forms and actually receiving payment from the federal government. On the other hand, the influence of federal grants is much more indirect, and thus it seems reasonable that people have less of an idea of how much of an impact the federal government is having on their everyday lives.

So, taken all together, it seems evident that voters do not respond that well to presidential pork. Rather, the distance of their ideology and the candidates along with their party ID are the only influence over their decision of who to vote for and whether or not to vote at all. Even when pork has a statistically significant effect, the substantive effect is negligible. Perhaps this measure of pork, which has been standard in the literature, is not the best operationalization of presidential pork. But the investigation of what would be a better measure is a topic for future research in another paper.

2.7 Appendix

2.7.1 County Level Analysis of the Influence of Federal Grant Spending

In this section, I revisit the county level analysis done by Kriner and Reeves (2012). This type of empirical investigation makes up the bulk of their paper. I do not spend a lot of effort taking their analysis down in great detail. I simply show here that there is serious reason to doubt their results.

The theory of how the change in federal grants influences people’s vote does not differentiate between Republicans or Democrats incumbent presidents. If there can be a distinction, it might be that Republican candidates are less likely to be accepting of the government money used towards their benefit because it opposes their ideology of small government. Table 2.8. shows the results for a panel regression analysis of county level data for the presidential election years from 1988 to 2008 broken up by the partisan identity of the incumbent president at that time. I
balance the panel dataset so that the plm package in R will compute much faster. The dependent variable is the percentage change in the two party vote share of the incumbent candidate. Since $\Delta g_{it}$ is highly skewed toward the right, I will add 1 to it (to make all of the values positive) and then take the natural log to make it normally distributed. Before, I had simply eliminated counties with extreme values. But eliminating more counties after balancing the data may be too much trimming of the data.

One can see from 2.8 that the coefficient for Republican incumbent presidents is positive and statistically significant, just like it is in Kriner and Reeves (2012). However, for Democratic incumbent presidents, the coefficient is negative. This complicates the empirical analysis in Kriner and Reeves (2012) who give no reason to differentiate the results by party.

I offer two explanations for this strange result. First, people could respond to Republican presidents sending them pork barrel projects through grants and respond negatively to Democratic presidents sending them pork. This, however, seems very unlikely. There is no reason why voters would respond negatively to Democratic presidents sending them pork. Perhaps not responding at all would be possible. But to respond in a negative way is counter to everything political scientists have understood about electoral behavior. Second, there could be an intervening variable between counties that tend to receive more grants and propensity to vote Republican.

But even if one does not believe my critique and still believes the results of Kriner and Reeves (2012), their paper does not say anything about the nature of the increase in votes. From my analysis in the main paper, I show that it is possible that people who already support the incumbent candidate are more likely to turn out to vote. Their county level analysis does not say anything about whether people are switching votes or turning out more to vote.

### 2.7.2 Results for Swing States Only

Presidential candidates really only care about influencing voters in swing states. None of the above results matter if it only really increases the probability that a person in places like California or Alabama will vote for the incumbent candidate, but rather only the states that are thought to a close call in the election. Thus, it makes sense to only include only these states in the statistical analysis. My operationalization of a swing state is a mix of a measure of how
Table 2.8: Panel regression model for the county level analysis.

<table>
<thead>
<tr>
<th></th>
<th>Republican</th>
<th>Republican</th>
<th>Democrat</th>
<th>Democrat</th>
</tr>
</thead>
<tbody>
<tr>
<td>log(Δgrants+1)</td>
<td>0.790***</td>
<td>0.803***</td>
<td>−0.399</td>
<td>−0.540**</td>
</tr>
<tr>
<td></td>
<td>(0.118)</td>
<td>(0.117)</td>
<td>(0.205)</td>
<td>(0.199)</td>
</tr>
<tr>
<td>TV spending diff</td>
<td>0.039***</td>
<td></td>
<td>0.378***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td></td>
<td>(0.044)</td>
<td></td>
</tr>
<tr>
<td>appearance diff</td>
<td>0.289***</td>
<td></td>
<td>0.318***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.021)</td>
<td></td>
<td>(0.030)</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.005</td>
<td>0.029</td>
<td>0.001</td>
<td>0.065</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>−0.327</td>
<td>−0.295</td>
<td>−0.999</td>
<td>−0.872</td>
</tr>
<tr>
<td>Num. obs.</td>
<td>12444</td>
<td>12444</td>
<td>6222</td>
<td>6222</td>
</tr>
</tbody>
</table>

***p < 0.001, **p < 0.01, *p < 0.05

The results shown in Table 2.10 show that when the statistical analysis only includes swing states, the coefficient for all of the models are pretty much the same and have the same statistical significance as the previous ones. Model 1 in Table 2.10 shows the coefficient for Δg_{it} to be positive but borderline statistically significant. Models 2-3 of Table 2.10 show the coefficients much as they were when all of the states were included, the coefficients for Δg_{it} become positive but still statistically insignificant when log (g_{it}) is included as a control variable and the coefficient for log (g_{it}) is negative but here statistically insignificant. This is the exact opposite of what we would expect if in fact the president were trying to target grants to gain more support during the election for either himself or his candidate.
<table>
<thead>
<tr>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado</td>
</tr>
<tr>
<td>Florida</td>
</tr>
<tr>
<td>Indiana</td>
</tr>
<tr>
<td>Iowa</td>
</tr>
<tr>
<td>Michigan</td>
</tr>
<tr>
<td>Missouri</td>
</tr>
<tr>
<td>Nevada</td>
</tr>
<tr>
<td>New Hampshire</td>
</tr>
<tr>
<td>New Mexico</td>
</tr>
<tr>
<td>North Carolina</td>
</tr>
<tr>
<td>Ohio</td>
</tr>
<tr>
<td>Pennsylvania</td>
</tr>
<tr>
<td>Virginia</td>
</tr>
<tr>
<td>Wisconsin</td>
</tr>
</tbody>
</table>

Table 2.9: Swing states for the 2008 presidential election.
Table 2.10: Probit Regression for swing states only in 2008.

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>−0.085</td>
<td>0.709</td>
<td>0.734</td>
</tr>
<tr>
<td></td>
<td>(0.196)</td>
<td>(0.437)</td>
<td>(0.443)</td>
</tr>
<tr>
<td>republican</td>
<td>1.229***</td>
<td>1.226***</td>
<td>1.226***</td>
</tr>
<tr>
<td></td>
<td>(0.075)</td>
<td>(0.075)</td>
<td>(0.075)</td>
</tr>
<tr>
<td>democrat</td>
<td>−0.734***</td>
<td>−0.732***</td>
<td>−0.733***</td>
</tr>
<tr>
<td></td>
<td>(0.078)</td>
<td>(0.078)</td>
<td>(0.078)</td>
</tr>
<tr>
<td>ideology</td>
<td>1.780***</td>
<td>1.781***</td>
<td>1.781***</td>
</tr>
<tr>
<td></td>
<td>(0.066)</td>
<td>(0.067)</td>
<td>(0.066)</td>
</tr>
<tr>
<td>△grants</td>
<td>−0.097</td>
<td>0.058</td>
<td>0.230</td>
</tr>
<tr>
<td></td>
<td>(0.089)</td>
<td>(0.124)</td>
<td>(0.702)</td>
</tr>
<tr>
<td>log(grants)</td>
<td>−0.119</td>
<td>−0.123*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.061)</td>
<td>(0.062)</td>
<td></td>
</tr>
<tr>
<td>△grants×log(grants)</td>
<td></td>
<td></td>
<td>−0.023</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.093)</td>
</tr>
<tr>
<td>N</td>
<td>7148</td>
<td>7148</td>
<td>7148</td>
</tr>
<tr>
<td>Log Like</td>
<td>−1529.25</td>
<td>−1527.65</td>
<td>−1528.55</td>
</tr>
<tr>
<td>AIC</td>
<td>3058.5</td>
<td>3055.3</td>
<td>3057.1</td>
</tr>
</tbody>
</table>

Dep var: McCain vote =1

***p < 0.001, **p < 0.01, *p < 0.05
2.7.3 Results for the Co-Partisan Hypothesis

In this section, I evaluate the theory that people who have a congressman who is of the same party as the president will be more responsive to presidential pork than those people who do not. Kriner and Reeves (2012) cite this as a major factor in how pork is communicated to the people in a local area. For this, I simply add a dummy variable to Equation 2.1 indicating whether or not the respondent’s House member is a Republican for the 2008 analysis. The theory is that, since presidents do not have a very good connection with the local population, his co-partisans in Congress will be able to advertise how much be spent in their county. They would have an incentive to do this since each of them would rather work with a president from their own party than from the other. If this were true, then we would expect an interaction variable between the house dummy and the log \((g_{it})\) and \((\Delta g_{it})\) variables to be statistically and substantively significant.

We can see from Table 2.11 that none of the interaction variables are statistically significant. And the addition of these variable does not change the log \((g_{it})\) and \((\Delta g_{it})\) coefficients either. This goes against the logic of the theory if it was indeed true: presidents would want congressmen and senators to vouch for them where they need it most.
<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.765***</td>
<td>1.515***</td>
<td>1.515***</td>
<td>1.406***</td>
</tr>
<tr>
<td></td>
<td>(0.193)</td>
<td>(0.352)</td>
<td>(0.352)</td>
<td>(0.395)</td>
</tr>
<tr>
<td>repub</td>
<td>1.242***</td>
<td>1.237***</td>
<td>1.237***</td>
<td>1.237***</td>
</tr>
<tr>
<td></td>
<td>(0.049)</td>
<td>(0.049)</td>
<td>(0.049)</td>
<td>(0.049)</td>
</tr>
<tr>
<td>democ</td>
<td>−0.796***</td>
<td>−0.798***</td>
<td>−0.798***</td>
<td>−0.798***</td>
</tr>
<tr>
<td></td>
<td>(0.043)</td>
<td>(0.043)</td>
<td>(0.043)</td>
<td>(0.043)</td>
</tr>
<tr>
<td>ideology</td>
<td>1.766***</td>
<td>1.765***</td>
<td>1.765***</td>
<td>1.765***</td>
</tr>
<tr>
<td></td>
<td>(0.035)</td>
<td>(0.035)</td>
<td>(0.035)</td>
<td>(0.035)</td>
</tr>
<tr>
<td>△grants</td>
<td>0.107</td>
<td>0.225**</td>
<td>0.225**</td>
<td>0.186**</td>
</tr>
<tr>
<td></td>
<td>(0.074)</td>
<td>(0.087)</td>
<td>(0.087)</td>
<td>(0.071)</td>
</tr>
<tr>
<td>house</td>
<td>0.080</td>
<td>0.066</td>
<td>0.066</td>
<td>0.318</td>
</tr>
<tr>
<td></td>
<td>(0.041)</td>
<td>(0.041)</td>
<td>(0.041)</td>
<td>(0.410)</td>
</tr>
<tr>
<td>△grants×house</td>
<td>−0.080</td>
<td>−0.080</td>
<td>−0.080</td>
<td>−0.080</td>
</tr>
<tr>
<td></td>
<td>(0.098)</td>
<td>(0.097)</td>
<td>(0.097)</td>
<td>(0.097)</td>
</tr>
<tr>
<td>log(grants)</td>
<td>−0.103*</td>
<td>−0.103*</td>
<td>−0.087</td>
<td>−0.036</td>
</tr>
<tr>
<td></td>
<td>(0.040)</td>
<td>(0.040)</td>
<td>(0.048)</td>
<td>(0.057)</td>
</tr>
<tr>
<td>log(grants)×house</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Num. obs.</td>
<td>18431</td>
<td>18431</td>
<td>18431</td>
<td>18431</td>
</tr>
</tbody>
</table>

***p < 0.001, **p < 0.01, *p < 0.05

Table 2.11: Probit Regression with variables of the partisanship of the respondent’s congressman for 2008. Standard errors are clustered by county.
<table>
<thead>
<tr>
<th>Dataset</th>
<th>McCain</th>
<th>Obama</th>
</tr>
</thead>
<tbody>
<tr>
<td>whole CCES</td>
<td>50.81%</td>
<td>49.19%</td>
</tr>
<tr>
<td>verified votes</td>
<td>50.07%</td>
<td>49.93%</td>
</tr>
<tr>
<td>NA elimination</td>
<td>49.99%</td>
<td>50.01%</td>
</tr>
<tr>
<td>actual votes</td>
<td>46.31%</td>
<td>53.69%</td>
</tr>
</tbody>
</table>

Table 2.12: Comparison of votes between the CCES and actual vote count in the population.

<table>
<thead>
<tr>
<th>Race</th>
<th>CCES</th>
<th>Census 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>white</td>
<td>82.2%</td>
<td>63.7%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>6.1%</td>
<td>16.3%</td>
</tr>
<tr>
<td>African-American</td>
<td>6.1%</td>
<td>12.6%</td>
</tr>
</tbody>
</table>

Table 2.13: Comparison between races percentages in the CCES and the actual percentages in the population

2.7.4 The Number of Votes for McCain and Obama in the CCES

The CCES has a disproportional number of respondents in it compared to those in the actual American population. This is because the number of respondents who voted for McCain versus the number of respondents who voted for Obama, is inconsistent with the actual percentages that were calculated during the election. The respondents self report their race as being white much more than the US Census Bureau calculates as being in the actual population. This could be due to the fact that the CCES was an internet survey and over-represents wealthy people who use the internet, who also tend to be more white than non-white.

2.7.5 Does Presidential Pork Influence Turnout in General?

2.7.5.1 The Model

If the theory that voters respond to pork barrel spending is correct, then we should observe an increase in the level of turnout for those who receive more of it. To evaluate the Turnout Hypothesis, I utilize Adams, Merrill and Grofman (2005) who provide a conditional logit model
in their Unified Theory of Voter Turnout. The utility of candidate $r$ is given by

$$U_i (r) = -\beta_1 (q_i - s_r)^2 + \beta_2 b_{ir} + \epsilon_{ir}$$  \hfill (2.7)$$
as before. I do not have the probability that a respondent’s vote will change the election as is the case with Riker and Ordeshook (1968), but instead utilize the theory of expressive voting that is delineated in works such as Schuessler (2000a) and Schuessler (2000b). This theory says that a person’s decision to vote for a candidate is simply the voter’s satisfaction for the candidate regardless of the outcome of the election. He is simply showing up to the polls because he receives a benefit by expressing his support for the candidate by voting for him. Yet this level of satisfaction must overcome some threshold level, which is labeled as $T_i (a)$. The levels for both of these are given by demographic characteristics of the citizen plus the level of federal spending:

$$T_i (a) = \gamma_0 + \gamma_1 \log (g_{it}) + \gamma_2 \Delta g_{it} + \tilde{\gamma} Z_i + \epsilon_{ia}$$  \hfill (2.8)$$

where $\tilde{\gamma} Z_{ij}$ is a list of various control variables which include a dummy variable for being white, a dummy for being black, income level, and $|q|$. I use the $|q|$ variable to measure how extreme a respondent’s political views are whether Left or Right. The constant, $\gamma_0$ can be interpreted as the duty variable used in Riker and Ordeshook (1968) as well as any other systematic factors that induce citizens to turnout that are not included as control variables. This is important for the construction of the structural model used in the estimation strategy. Respondent $i$ votes for candidate $k$ if his utility is higher than candidate $r$ and if it is higher than the threshold level:

$$\Pr [(U_i (r) > U_i (d)) \cap (U_i (r) > T_i (a))]$$  \hfill (2.9)$$

Then, using a similar logic as above, the probability that respondent $i$ will vote for candidate $r$ is given by

$$P_{ir} = \frac{e^{V_i (r)}}{e^{V_i (r)} + e^{V_i (d)} + e^{V_i (a)}}$$  \hfill (2.10)$$

and the probability that respondent $i$ will abstain from voting is given by $1 - P_{ir} - P_{id}$. Thus, the likelihood function for the multinomial conditional logit model is expressed as

$$L (\beta, \gamma | X, y, s) = \Pi_i (P_{ir})^{y_{ir}} (P_{id})^{y_{id}} (1 - P_{ir} - P_{id})^{y_{ia}}$$  \hfill (2.11)$$
where \( y_{ia} \) is equal to 1 if respondent \( i \) abstained from voting and 0 otherwise. The Turnout Hypothesis suggest that presidential pork induces people to turnout to vote and thus \( \gamma_1 \) and \( \gamma_2 \) will be negative and statistically significant. This is because negative values increase the likelihood that the respondent will turn out to vote since they decrease the value of \( T_i(a) \).

The candidate ideal point positions for McCain and Obama were determined along with the Bayesian computation of the survey respondents. It should be noted that both McCain and Obama had a high number of NAs in their response–they decided not to vote on some of the important bills that were used as questions for the survey. This, of course, might be to have strategic ambiguity in their campaigns. Obama had 3 non-responses to the 8 Senate bills that the survey used, and McCain had 4. The CCES used a House bill that would withdraw the troops from Iraq within 180 days (HR 2237) that did not reach the Senate. However, since both McCain and Obama had very publicly made their stance on this issue, I impute a yea for Obama and a nay for McCain as was their stance in the campaign.

Results

The first task is to find if presidential pork influences people to turn out at all, which is where Equation 2.11 comes into play. Remember that \( T_i(\alpha) \) is the threshold for respondent \( i \) to turn out to vote (the large it is the higher is the threshold which makes it harder to turn out to vote). Thus, all of the \( \alpha \) variables that are negative increase the likelihood of turnout and all those that are positive decrease the likelihood of turnout. Table 2.15 shows the results for the maximum likelihood estimation for Equation 2.11, the likelihood function for turnout. It seems that \( \Delta g_{it} \) does not have any effect on voter turnout, as the coefficient is positive (albeit small) and statistically insignificant. In Model 1 of Table 2.15, the coefficient for \( \log(g_{it}) \) is negative and statistically insignificant. A standard change of \( \log(g_{it}) \) changes the probability of an independent voter who is a white person with an average income, age, and education level from a 35.56% probability of abstention to a 33.76% probability. So it seems that increasing the per capita level of grant spending will increase the likelihood that a respondent will turn out to vote by a very small amount and we cannot be very sure of the effect because it is not statistically significant. We should also note that the turnout coefficient is not party dependent. So the estimates in Table 2.15 do not tell us that more per capita grant spending helped McCain.
in the election. They only can tell us that more spending raises the probability that people turn out in general. We can see that in Model 2 the coefficient is not statistically significant. For a person of the same type of described as above, a standard change of $\Delta g_{it}$ changes the probability of abstention from 40.68% to 39.85%. Hence, this is significantly smaller that the effect of $\log(g_{it})$. When I add both variables to the equation, which is Model 3 in Table 2.15, the coefficients for both $\log(g_{it})$ and $\Delta g_{it}$ are negative but only the one for $\log(g_{it})$ is statistically significant. For a similar person as described above with an average amount of $\Delta g_{it}$, a standard change of $\log(g_{it})$ changes the probability of abstention from 43.88% to 42.49%. For a person as described above with an average amount of $\log(g_{it})$, a standard change of $\Delta g_{it}$ changes the probability of abstention from 43.29% to 43.18%. Another method of investigating the effect of pork on turnout is to use a turnout as a dependent variable in a simple probit model as presented in Table 2.14. We see that for all of the coefficients for $\Delta g_{it}$ and $\log(g_{it})$ only the one for $\log(g_{it})$ in Model 2 is statistically significant. In Model 2 of Table 2.14, a standard change of $\log(g_{it})$ changes the predicted probability of turning out to vote from 73.18% to 74.03% for an independent. For Model 3, a standard change in $\Delta g_{it}$ for an independent increases the probability of turning out from 73.7% to 73.51% and a standard change in $\log(g_{it})$ changes the probability from 73.12% to 74.11%. But these results are not statistically significant so we should not take them too seriously. This is similar to the results in Table 2.15 where $\log(g_{it})$ has a meddling effect on turnout. One might argue that turnout in the year 2008 was unusually high for a presidential election. This is true, so I include the 1988 election which is a more normal election in terms of turnout. These results are reported in Table 2.16, in which the coefficients are not statistically significant for any of the pork variables. Altogether, this analysis shows very weak evidence that people do respond to presidential pork by turning out to vote, and even if they do respond it is by very inconsiderable amount.\footnote{An interesting but unrelated note is that the dummy variable for a swing state is statistically significant, but in the opposite direction that we would expect–more people abstain in swing states rather than in non-swing states.}
Table 2.14: Probit for turnout in the 2008 presidential election.

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>−0.456***</td>
<td>−0.979***</td>
<td>−1.058***</td>
<td>−0.955**</td>
</tr>
<tr>
<td></td>
<td>(0.055)</td>
<td>(0.234)</td>
<td>(0.313)</td>
<td>(0.315)</td>
</tr>
<tr>
<td>republican</td>
<td>0.280***</td>
<td>0.285***</td>
<td>0.285***</td>
<td>0.285***</td>
</tr>
<tr>
<td></td>
<td>(0.029)</td>
<td>(0.029)</td>
<td>(0.028)</td>
<td>(0.028)</td>
</tr>
<tr>
<td>democrat</td>
<td>0.186***</td>
<td>0.182***</td>
<td>0.182***</td>
<td>0.183***</td>
</tr>
<tr>
<td></td>
<td>(0.028)</td>
<td>(0.028)</td>
<td>(0.028)</td>
<td>(0.028)</td>
</tr>
<tr>
<td></td>
<td>ideology</td>
<td></td>
<td>0.215***</td>
<td>0.213***</td>
</tr>
<tr>
<td></td>
<td>(0.025)</td>
<td>(0.025)</td>
<td>(0.025)</td>
<td>(0.025)</td>
</tr>
<tr>
<td>△grants</td>
<td>0.064</td>
<td>−0.033</td>
<td>0.817</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.048)</td>
<td>(0.065)</td>
<td>(0.576)</td>
<td></td>
</tr>
<tr>
<td>log(grants)</td>
<td>0.073*</td>
<td>0.085</td>
<td>0.072</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.031)</td>
<td>(0.043)</td>
<td>(0.043)</td>
<td></td>
</tr>
<tr>
<td>swing</td>
<td>−0.028</td>
<td>−0.017</td>
<td>−0.019</td>
<td>−0.010</td>
</tr>
<tr>
<td></td>
<td>(0.040)</td>
<td>(0.040)</td>
<td>(0.040)</td>
<td>(0.038)</td>
</tr>
<tr>
<td>△grants×log(grants)</td>
<td></td>
<td></td>
<td></td>
<td>−0.113</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.074)</td>
</tr>
<tr>
<td>N</td>
<td>25340</td>
<td>25340</td>
<td>25340</td>
<td>25340</td>
</tr>
<tr>
<td>Log Like</td>
<td>−17324</td>
<td>−17312</td>
<td>−17311</td>
<td>−17302</td>
</tr>
<tr>
<td>AIC</td>
<td>34672</td>
<td>34648</td>
<td>34649</td>
<td>34632</td>
</tr>
</tbody>
</table>

Dep var: turnout = 1

***p < 0.001, **p < 0.01, *p < 0.05
Table 2.15: Multinomial conditional logit Regression for turnout in the 2008 presidential election.

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>spatial distance</td>
<td>0.537***</td>
<td>0.539***</td>
<td>0.537***</td>
</tr>
<tr>
<td></td>
<td>(0.048)</td>
<td>(0.040)</td>
<td>(0.045)</td>
</tr>
<tr>
<td>party ID</td>
<td>1.690***</td>
<td>1.691***</td>
<td>1.698***</td>
</tr>
<tr>
<td></td>
<td>(0.095)</td>
<td>(0.176)</td>
<td>(0.136)</td>
</tr>
<tr>
<td>constant</td>
<td>2.773***</td>
<td>2.185***</td>
<td>2.619***</td>
</tr>
<tr>
<td></td>
<td>(0.658)</td>
<td>(0.192)</td>
<td>(0.132)</td>
</tr>
<tr>
<td>log(grants)</td>
<td>−0.081</td>
<td>−0.061***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.089)</td>
<td>(0.010)</td>
<td></td>
</tr>
<tr>
<td>△ grants</td>
<td>−0.074</td>
<td>−0.010</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.550)</td>
<td>(0.016)</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>27,650</td>
<td>27,650</td>
<td>27,650</td>
</tr>
<tr>
<td>Log Like</td>
<td>-22823.83</td>
<td>-22828.591</td>
<td>-22824.07</td>
</tr>
<tr>
<td>AIC</td>
<td>45665.67</td>
<td>45675.19</td>
<td>45668.14</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses.

***p < 0.001, **p < 0.01, *p < 0.05
<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>spatial distance</td>
<td>4.294***</td>
<td>4.293***</td>
<td>4.293***</td>
</tr>
<tr>
<td></td>
<td>(0.617)</td>
<td>(0.631)</td>
<td>(0.631)</td>
</tr>
<tr>
<td>party ID</td>
<td>0.863</td>
<td>0.865</td>
<td>0.865</td>
</tr>
<tr>
<td></td>
<td>(0.491)</td>
<td>(0.495)</td>
<td>(0.494)</td>
</tr>
<tr>
<td>constant</td>
<td>2.681***</td>
<td>3.262***</td>
<td>3.251***</td>
</tr>
<tr>
<td></td>
<td>(0.482)</td>
<td>(0.804)</td>
<td>(0.680)</td>
</tr>
<tr>
<td>log(grams)</td>
<td>-0.101</td>
<td>-0.098</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.107)</td>
<td>(0.106)</td>
<td></td>
</tr>
<tr>
<td>△grants</td>
<td>-0.100</td>
<td>-0.077</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.220)</td>
<td>(0.232)</td>
<td></td>
</tr>
<tr>
<td>turnout84</td>
<td>-1.960***</td>
<td>-1.953***</td>
<td>-1.954***</td>
</tr>
<tr>
<td></td>
<td>(0.074)</td>
<td>(0.076)</td>
<td>(0.111)</td>
</tr>
</tbody>
</table>

N 1534 1534 1534
Log Like -1151.053 -1150.688 -1150.632
AIC 2320.106 2319.376 2321.264

Robust standard errors in parentheses.

***p < 0.001, **p < 0.01, *p < 0.05
2.7.6 Various Graphs and Tables

I present various graphs and tables here that I deem helpful but not crucial to understanding the main argument in the text. I present them approximately in the order that they would appear in the text.

<table>
<thead>
<tr>
<th>Candidate</th>
<th>ideal point estimate</th>
<th>st. dev</th>
<th>median</th>
</tr>
</thead>
<tbody>
<tr>
<td>McCain</td>
<td>0.025</td>
<td>0.383</td>
<td>0.024</td>
</tr>
<tr>
<td>Obama</td>
<td>−0.726</td>
<td>0.525</td>
<td>−0.676</td>
</tr>
<tr>
<td>Bush</td>
<td>0.260</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>Dukakis</td>
<td>−0.352</td>
<td>−</td>
<td>−</td>
</tr>
</tbody>
</table>

Table 2.17: Ideal point estimates for the candidates for 1988 and 2008.

Figure 2.1: The histogram of real per capita grants for ANES respondents in 1988.
Figure 2.2: The histogram of the percent change in grants for ANES respondents for 2008.

Figure 2.3: The histogram of real per capita grants for CCES respondents in 2008.
Figure 2.4: The histogram of the percent change in grants for 2008 for CCES respondents.

Figure 2.5: The histogram of real per capita grants for CCES respondents in 2012.
Figure 2.6: The histogram of the percent change in grants for 2012 for CCES respondents.
CHAPTER 3

A Factional Theory of Parties: How Intense Policy Demanders Create Big-Tent Parties

3.1 Introduction

Why do we have political parties—particularly the big tent parties—in American politics? The question of why parties exist at all was posed by Schwartz (1989). His theory is that parties were created in legislatures by congressmen forming long-coalitions to benefit only those who are members.\(^1\) Aldrich (1995) builds on this idea, arguing that political parties are created by politicians as a way to solve the collective action problem of getting reelected. Both of these became standard thinking for why American parties exist. And most of the formal models of political party formation present them being created in legislative assemblies (for example Eguia, 2012; Baron, 1993), which makes sense for a particular American time period since political parties actually originated this way in the late 18th century. But just because parties started there does not mean that they continue to be motivated by politicians who simply want to be reelected to office. We need to think about what is actually the main reason why political parties exist today.

This is why a new line of literature has emerged which view the nature of political parties in a completely different manner. The basic idea of parties being driven by groups in society goes back to, for example, Sundquist (1992); but the flagship article in this line of literature is now Bawn et al. (2012).\(^2\) Although both Bawn et al. (2012) and Sundquist (1992) offer loose

\(^1\)Schwartz defines breadth as the percentage of legislators in the coalition and length as the percentage of bills that the coalition supports.

\(^2\)There is even earlier work that views parties in this way going back to Schattschneider. Bawn et al. (2012) is the first article to draw a contrast to Schwartz (1989) and Aldrich (1995). They give an elaborate alternative
deductive reasoning to make an argument as to why groups would want to coalesce, these are lacking in any real micro-foundational analysis—there is no Nash equilibrium statement in either. Despite the informal nature of the papers, I use their viewpoint of parties as being motivated by groups to present a similar theory of how groups in American society form big-tent party coalitions by constructing a formal model around the idea. In particular, I take the logic of groups having specific policy demands in Bawn et al. (2012) and combine it with the logic of (Miller and Schofield, 2003, 2008) that these groups (activists as they would call them) have resources to increase the campaign activity of a party.

My synthesis of these two streams of literature results in a theory of how groups form coalitions. Central to this paper is the concept of intense policy demanders, which is the main mechanism which allows me to predict which groups will join which ideological coalition. I construct an environment of only four interest groups, each of which has its own ideal point on two policy dimensions. Groups in society must decide to either coalesce in large-tent parties or run on their own in an election based on two factors: (1) their ideology and (2) the amount of resources that they have. The utility function for each group is weighted for each dimension based on how much the group cares about that particular policy dimension. If they form coalitions of parties amongst themselves, they are allowed to pool together their resources (such as money and volunteers) to increase the campaign impact of their party.

I then show how coalitions can form based on which groups are willing to logroll with each other and based on the size of the resources that each group has.3 I find contrary to previous research that, when there are only two policy dimensions and four groups in society, coalitions can be hard to form—groups running on their own in single-member district plurality systems is much more likely than is usually thought in the political science literature on groups forming parties (Sundquist, 1992; Levy, 2004; Bawn et al., 2012; Noel, 2014). The formation on large-

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3 Another implication of my model can analyze is when it is rational for a group to run as a third party candidate. We know that single-member district plurality systems encourage no more than two parties to run in any one election. But is it ever rational for all of the interest groups to run by themselves instead of coalescing around parties? Or even if other interest groups have coalesced around a party, is it ever rational for a group to run by itself under plurality? Surprisingly, the answer is yes, but not on account of the decision of the group to run on its own.
tent parties depends mostly on the strength of campaign effectiveness that one assumes in the model. Thus, contrary to my initial intuition, the assumption that groups have intense policy demand for one issue is not a sufficient condition for large-tent party formation by groups. However, the existence of three or more policy dimensions and six or more groups is enough to guarantee the existence of large-tent parties. Furthermore, I find that coalitions need not be minimal winning as also previously thought in the literature (Riker, 1962; Riker and Ordeshook, 1973; Buchanan and Tullock, 1962; Koehler, 1972; Aumann and Kurz, 1977). This is because it is only beneficial to bring new groups into a coalition when that new group does not go against any of the policy positions of the groups already in the coalition; they simply add more resources to the group.

3.2 Related Literature

A growing group of political scientists have begun to see parties differently than the traditional way set out by Schwartz (1989) and Aldrich (1995). Instead of viewing parties as a useful tool for politicians who wish to get elected, Bawn et al. (2012) view them as a way for interest groups to get what they want. In their theory, they call them intense policy demanders because these groups focus on one particular policy area. The motivation for this is the well documented empirical evidence that groups have a great amount of influence in party politics (Baylor, 2013; Cohen et al., 2009; Karol, 2009; DiSalvo, 2012; Noel, 2014). But Bawn et al. (2012) make claims that are not necessarily supported by any formal analysis. Their toy example is the setup in Figure 3.1. Particularly, they claim that the clergy and shepherds will form a party (Heritage Party) and the saloon keepers, coffee growers, and teachers will form another party (Freedom Party) to counter them. Such as claim may seem feasible, but I show that it is not necessarily supported by a micro-foundational analysis. For example, the authors seem to want to make the clergy focused on religious values by placing their ideal point high the religious values dimension and make them moderate by placing them towards the center on the international trade dimension. One must use caution when doing this because, if the preferences

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4I will call these units groups, but we can think of them as interests groups or larger factions within a party (social conservatives, for example).
are not formally stated, one would think that the clergy weighs the social dimensions and the international trade dimension equally in their utility function. If preferences are weighted equally for shepherds, then they are not intense policy demanders in the way I am defining it. They simply have just as strong a preference for a moderate religious policy as they do for strong protectionism. I show how when all of the groups weigh each policy dimension equally can be problematic when trying to specify an equilibrium where groups form large-tent parties.

![Diagram](https://via.placeholder.com/150)

**Figure 3.1:** The picture from figure 1 of Bawn et al. (2012).

Furthermore, the authors do not specify exactly the type of benefit of being in a coalitional party. If there are no other parties, then why would two groups form a coalition? What are they fighting against? It seems that if no other parties are formed then a particular group would actually have a good chance of winning the election. Is it purely that joining a coalition makes it more likely that the coalitional party is more likely to be picked over the over groups? For Riker (1962) and the literature that followed in which parties form within a legislature, the benefit is to gain a minimum winning coalition. But with the new idea of groups forming parties outside
of the legislature this concept does not translate into the new environment because these groups are normally assumed to not have enough members to gain a majority just by mobilizing their voters even with a coalition of multiple groups. Other researchers (Schofield and Sened, 2006; Schofield, 2006; Aldrich, 1983a,b) are careful to state the influence that these groups–activists in their own words–have on elections. I show it can be problematic stating that groups will form coalitions without any type of activist influence on the election. One benefit that groups can have when they coalesce together in a party is the use of their resources to influence an election. To help explain what I mean, here are two simple examples. In the first scenario, suppose there are 100 groups who are already in a party together and have a one unit distance from a representative pivotal voter in the population. Now suppose that another group comes along and forms a party with a platform one unit distance from the pivotal voter in the opposite direction. If the size of groups have no influence of the decision of the pivotal voter, then the second party with only 1 group supporting it will have an equal probability of winning in the election as the first party with 100 groups supporting it. In the second scenario, suppose that there are 4 groups running as parties equal distance to the median voter in a two-dimensional policy space. They each have probability of winning of $\frac{1}{4}$. Now suppose that two of the groups coalesce into a party. They have just increased their (and inadvertently the other two groups) chances of winning from $\frac{1}{4}$ to $\frac{1}{3}$. This logic will become evident in my model.

### 3.3 The Simple Group Environment

I will present a formal model to show the logic of my theory. I start with a very simple environment with symmetry for all of the agents. Large-tent parties are possible, but only if campaign impact has enough influence. I will then break symmetry in only one area, the intensity by which one of the interest groups values one of the dimensions. Although large-tent parties are more likely in this case, the centrality of campaign impact persists.

#### 3.3.1 The Environment

The model I will use in this paper is very similar to Bawn et al. (2012): a hypothetical country exists without parties, and it is about to have its first presidential election. For the following
environment, I will call it the first Simple Group Environment (SGE).

**Assumption 1** There is a two dimensional issue space \((x, y) \in \mathbb{R}^2\).

**Assumption 2** There are four interest groups, \(K = \{a, b, c, d\} \). Additionally there is an independent voter denoted as \(i\). Any party that is running in an election competes for the vote of \(i\) (which can also be thought of as a representative pivotal voter).

Central to this paper is the concept of resources that each group can contribute to the campaign effort. In the literature, these resources are the many activities that activists bring to a political campaign. (Aldrich, 1983b, 65) summarizes this logic:

> “the implication is that activism is a kind of contribution of scarce resources to a candidate or party (contributing, for example, time, effort, or money), just as voting is a contribution of a vote to a candidate. Thus, I am not considering the activity of a political leader or entrepreneur, nor that of a professional politician. The more appropriate referent would be to the ‘grass roots’ activist, the kind who can be counted on to work for a variety of candidates and offices from time to time with regularity. These activists are those who make up the bulk of computerized mailing lists these days.”

I use this same logic for the type of resources each of the groups in the model possesses. These resources go toward whichever party the group is a member of to help it win the election. As (Miller and Schofield, 2003, 251) describe it, “candidates deploy their resources, via television and other media” which has an effect on the candidate-dependent valences. The fact that they are calling this influence valence may be confusing because this is not the typical use of the term in political science. Usually valence just refers to the likability of a particular candidate. Since there may not be an precise name for the phenomena of activists’ resources influence on the decision of voter \(i\), I will call this the campaign impact of the party, despite the tradition of (Miller and Schofield, 2003; Schofield and Sened, 2006; Schofield, 2006) to call it valence. This is also similar to what Levy (2004) does in her paper, but she has groups paying a cost to run their political party. If more groups join a party, then they can split this fixed cost amongst each other. To model this, I assume the following.
**Assumption 3** Each group is endowed with an amount of resources that it has available to use towards campaigning in the election to increase its campaign impact with voter $i$. I denote the resources for campaign impact for group $a$ as $n_a$.

**Assumption 4** Activists resources have decreasing marginal returns. Campaign effectiveness for party $k$ is given by $\lambda\sqrt{n_k}$ where $\lambda > 0$ is a scalar and $n_k$ denotes the resources of party $k$.$^5$

**Assumption 5** The resources for a party are additive by group resources. For example, if group $a$ is running alone, then the resources for party $a$ is just $n_a$. If groups $a$ and $c$ form a coalition party, then the resources for party $ac$ is $n_{ac} = n_a + n_c$.

**Assumption 6** The utility function for the independent voter for party $k$ is defined by

$$U_i(k) = -(x_k - x_i)^2 - (y_k - y_i)^2 + \lambda\sqrt{n_k} + \varepsilon_k$$  \hspace{1cm} (3.1)

where $\varepsilon_k$ is a stochastic component of voter $i$ for voting for party $k$ which is distributed type I extreme value.

**Assumption 7** When two groups decide to join a party, they can agree to one of two things.

1. They can agree to flip a coin and whoever wins the coin toss gets to have their ideal point as the party platform.

2. A group can concede its ideal point and run on the ideal point of its coalition partner.

Both groups need to agree to this arrangement for this coalition to form.

The groups who decide to join a party cannot know the outcome of the coin toss before they decide to join or not. So each of them will have an ex ante utility after they decide to coalesce but before the coin toss. This is to disallow spatial competition since it will make the model too complicated for the point that I want to make. The groups cannot commit to a policy outside one of their ideal points. This is similar to Osborne and Slivinski (1996) who disallow candidates to change their platform.

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$^5$This assumption follows (Miller and Schofield, 2003, 251).
Thus, each group has ten choices. First, it must decide either to run on its own or to coalesce with one of the other three groups. If it decides it wants to coalesce, it must also decide to split the ideal point with a coin toss, to let the other group have their ideal point as the party platform, or to hold their own ideal point as the party platform. For example, \( a \) has the choices set \( A = \{ A_a^b, A_a^c, A_a^d, A_b^l, A_b^h, A_c^b, A_c^h, A_d^b, A_d^h, W \} \). The subscript defines which group \( a \) wants to coalesce with. The superscript defines if \( a \) wants to flip a coin, \( s \), let the group which \( a \) wants to join with have that group's ideal point, \( l \), or hold its own ideal point, \( h \). The action \( W \) means that the group will not coalesce with any other group but rather run on its own.

**Definition 1** The action profile is the set of chosen actions for each group: \((A, B, C, D)\).

The action profile will result in some outcome. For example, two coin toss parties of groups \( a \) and \( c \) in one coalition and \( b \) and \( d \) in another. The utility function for a group is defined similar to the independent voter but without the campaign impact and stochastic factors and also with one other major exception: the intensity over issues is weighted differently.

**Assumption 8** The utility for group \( k \) is defined by \( U_k : A \times B \times C \times D \rightarrow \mathbb{R} \). Let \( \gamma_k \in [0,1] \) define the proportion of weight that faction \( k \) puts on issue \( x \). Interest group \( k \)'s utility function is given by

\[
U_k(Q) = -\gamma_k (x_Q - x_z)^2 - (1 - \gamma_k) (y_Q - y_z)^2
\]

where \( Q \) is the ideal point \((x_Q, y_Q)\) which is the resulting policy vector that results in some outcome \( Q \) (the ideal point of whichever party wins the election).

Note that there are always parties. Even when a group runs on its own, it is a party. The question is when do groups form coalitional or large-tent parties. When a group \( k \) decides to run on its own, denote its party as \( k \). When groups \( k \) and \( j \) form a party, denote it as \( kj \). If there is a tie in the election, then each of the tied parties gets an equal probability of winning the election through a random process.

The independent voter's ideal point is located at \((0,0)\). The location of the ideal points of the four groups are located around a box around the independent voter so that each is an
Figure 3.2: SGE1: the case when all groups care about both policies equally. The circles represent the indifference curves of the groups.

equal distance to him at some arbitrary distance $\theta$.\(^6\) The ideal points of groups $a$, $b$, $c$, and $d$ are located at points $(\theta, \theta)$, $(\theta, -\theta)$, $(-\theta, \theta)$, and $(-\theta, \theta)$ respectively as represented in Figure 3.2. This is to eliminate any type of spatial differences so that I can focus on the effect that campaign impact has on the decision on groups to coalesce or not rather than spatial distance difference between groups. When $a$ is running its own party, let $a^*$ denote the ideal point of party $a$. When groups $a$ and $c$ agree to run on a platform under the ideal point of $c$, denote the ideal point as $ac^*$.

**Definition 2** When groups $a$ and $c$ form a coalition and $b$ and $d$ run on their own, let the probability that $ac$ will win the election be denoted by $\pi$. And when $b$ and $d$ form a party and $a$ and $c$ run on their own, let the probability that $bd$ wins the election be denoted by $\tau$.

Note that, by symmetry, $\pi = \tau$. I state this because often I will state that $\pi = \tau$ in many of the lemmata and propositions—meaning that this is true for either coalition $ac$ or $bd$. But

\(^6\)This $\theta$ could obviously be chosen to be some actual number like 1, but it will help in the proofs to have it stay $\theta$ since it helps show why the computation works out the way it does.
also note that it is not necessarily the case that \( \pi = 1 - \tau \).\(^7\) This is because \( \pi \) and \( \tau \) exists in two mutually exclusive cases: if \( \pi \) exists because \( a \) and \( b \) are in a coalition while \( c \) and \( d \) are running on their own, then by definition \( \tau \) cannot exist because \( c \) and \( d \) are not in a coalition. Note that \( \frac{1}{3} \leq \pi = \tau \) because \( \lambda \geq 0 \) and, if there are three parties running, each one has at least \( \frac{1}{3} \) chance of winning given symmetry. Also note that when groups \( a \) and \( c \) form a party the probability that \( b \) will win is equal to the probability that \( d \) will win which is \( \frac{1-\pi}{2} \). Because \( \lambda \) is so important to this paper, I will give a definition to a particular point.

**Definition 3** Define \( \tilde{\lambda} \) such that \( \pi \left( \tilde{\lambda} \right) = \frac{1}{2} \).

I now address the question of what is the probability of each party winning. Suppose that groups \( a \) and \( c \) form a party. Since party \( ac \)'s ideal point is always equal distance from the independent voter than any other party running in the election, the spatial distance is always the same regardless of whether the party is one group or a coalition. So that the probability that \( i \) votes for party \( ac \) over both \( b \) and \( d \) is

\[
\pi = \text{Pr} \left[ U_i (ac) > U_i (b) \cap U_i (ac) > U_i (d) \right] \quad (3.3)
\]

Since the errors are distributed type I extreme value, according to Train (2009) probability that voter \( i \) votes for \( ac \) is

\[
\pi = \frac{e^{U_i(ac)}}{e^{U_i(ac)} + e^{U_i(b)} + e^{U_i(d)}} \quad (3.4)
\]

which is the same quotient that Adams, Merrill and Grofman (2005) use in their models. Note that \( e^{U_i(ac)} = e^{-2\theta^2} e^{\sqrt{2}\lambda} \). Thus, taking \( e^{\sqrt{2}\theta^2} \) out of Equation 3.4 gives the following

\[
\pi = \frac{e^{\sqrt{2}\lambda}}{e^{\sqrt{2}\lambda} + e^{\lambda} + e^{\lambda}} = \frac{1}{1 + 2e^{-(\sqrt{2}-1)\lambda}} \quad (3.5)
\]

which is very similar to the logit function.

Because the regular definition of Nash equilibrium gives equilibria that I would like to throw out, I need to use a Nash refinement in this paper. There are many possibilities: strong Nash, coalition-proof Nash, and the core from cooperative game theory. In this paper, I will use the concept of strong Nash equilibrium because it is easiest to use given the institutional framework of my model. The original concept comes from Aumann (1959), but one of the simplest definitions comes from Myerson (1991).

\(^7\)This is only true when \( \pi = \frac{1}{2} \).
**Definition 4** An action profile is a strong Nash equilibrium if there does not exist a set of players who could all gain by deviating together for some other combination of strategies that is jointly feasible for them. Denote the set of all strong Nash profiles as $\mathcal{C}$.

For example, the set $\mathcal{C} = \{(A^a_s, W, C^a_s, W)\}$ is the set of strong Nash equilibrium of the game if both $a$ and $c$ agree to coalesce splitting the party platform with a coin toss while both $b$ and $d$ are satisfied running alone. It would not be the set of strong Nash equilibrium if both $b$ and $d$ want to form a coalition splitting the party platform with a coin toss since these incentives of $b$ and $d$ obviously violate the incentive criteria in the definition of strong Nash equilibrium. Note that the set of strong Nash may contain multiple strategy profiles, for example $\mathcal{C} = \{\{A^a_s, B^b_s, C^a_s, D^b_s\}, \{A^a_s, B^b_s, C^a_s, D^c_s\}\}$. I will often use the set of stable coalitions and the set of strong Nash equilibria interchangeably.

### 3.3.2 When All Groups Care About All Policy Dimensions Equally

In this section, all groups care about each policy dimension equally, thus it is the case that $\gamma_k = \frac{1}{2}$ $\forall k$. Also let $n_k = 1$ $\forall k$. I will call this the Simple Group Environment 1 (SGE1). In this first example, since all of the factions have ideal points equal distance apart from one another, the resulting probability of winning is $1/4$. The task now is to figure out when groups form coalition parties and when they decide to run on their own.

**Lemma 5** In SGE1, if $\lambda > \tilde{\lambda}$ then for every group joining a coalition where they split the party platform with a coin toss is preferred to running on their own.

**Lemma 6** In SGE1, if two groups are already in a coalition then the remaining two groups who are not will want to be in a coalition where each of them split the party platform if $\lambda > \tilde{\lambda}$.

So if $\frac{1}{3} < \pi < \frac{1}{2}$ then it is not rational for a group to join a party even if two groups have already formed a party and are joining their resources. When would two groups decide to form a coalition by themselves? The following proposition gives the answer.

**Lemma 7** In SGE1, if the status quo is no groups coalescing then no group will want to coalesce with another group if $\lambda < \tilde{\lambda}$. 


These lemmata show the incentives for the groups depending on the level of $\lambda$ and indirectly the level of $\pi$ or $\tau$. I now have enough information to prove the main result for SGE1.

**Proposition 8** In SGE1, if $\lambda < \tilde{\lambda}$ then the set of strong Nash equilibrium consists of $\mathcal{C} = \{W, W, W, W\}$. If $\lambda > \tilde{\lambda}$ then the set of strong Nash equilibria consists of $\mathcal{C} = \{(A_a^w, B_a^w, C_a^w, D_a^w), (A_b^w, B_a^w, C_a^w, D_a^w)\}$.

**Proof.** Suppose that $\lambda > \tilde{\lambda}$. Lemma 7 implies that all of the groups are unhappy running alone. It is rational, for example, for groups $a$ to coalesce with $c$ or $b$. Suppose without loss of generality that it chooses to proposes to group $c$. But if these two groups are in a coalition while the other two groups, $b$ and $d$, are running alone, then Lemma 6 implies that $a$ and $d$ are unhappy running alone. They will want to form a coalition with each other. Therefore, each of the groups ends up in a coalition.

Suppose that $\lambda < \tilde{\lambda}$. Lemma 7 implies that all of the groups are happy not being in a coalition. Thus, all of the groups choosing $W$ is stable.

Thus, in SGE1 multiple parties are actually possible if activists have enough influence. The more influence campaign impact has on the decision of $i$ will bring a greater likelihood that coalition parties will form. Figure 3.3 shows that the cutpoint for $\pi(\lambda) = \frac{1}{2}$ is $\lambda \approx 1.67$. So the question is how likely is it that $\lambda > 1.67$? A $\lambda$ close to 2 means that activists have a very high amount of influence and an $\lambda$ close to zero means that activists have very little influence over a

![Figure 3.3: The function $\pi(\lambda)$.](image-url)
voter’s decision. Most political science research would support the assertion that \( \lambda \) is between 0 and 1. When \( \lambda < 1.67 \) each group maintains its own position on each of the policy dimensions of \( x \) and \( y \). When \( \pi = \tau > \frac{1}{2} \), the set of strong Nash equilibria is a set of coalitional parties: \( ac \) and \( bd \) or \( ab \) and \( cd \) (remember that \( a \) and \( d \) can never be in a party together). But it is only because two groups have an incentive join a coalition than to have a better chance of winning if the other two groups remain running on their own. The following corollary makes clear the welfare of each group when there are no coalitional parties versus when there are.

**Corollary 9** All groups are just as well off running on their own than when each group is in a coalition with another group.

**Proof.** One only needs to notice that \( EU_a (A^a, B^b, C^c, D^d) = EU_a (W, W, W, W) = -2\theta^2 \).

The research question is about creating parties not about abolishing them. The likelihood that a large-tent party does form is completely dependent on the value of \( \lambda \) that one assumes. Furthermore, none of the groups are better off when all of them are in some coalition as stated by Corollary 9. So there is not particular incentive for groups to join a coalition versus run on their own if it happens to be the case that \( \lambda = \tilde{\lambda} \).

In SGE1, coalitional parties are more awkward necessities than natural alliances if \( \lambda > \tilde{\lambda} \). The reason is because a coalition between \( a \) and \( c \) is just as likely as one between \( a \) and \( b \). Or to state it differently, each of the groups has to form a coalition with one of its half enemies on one of the policy dimensions. So there is nothing a priori which says which groups should coalesce with which. Even when there is a coalition because \( \lambda \geq 1.67 \) it is not that the two groups naturally like each other. They are actually enemies on one of the policy dimensions. They simply coalesce because it is optimal for them to gang up on the other two groups who are their enemies.

So, in summarizing SGE1, it is hard for parties to coalesce. Only when activists have a great amount of influence over the election are when coalitional parties exist. Even when they do exists, the coalitions contain enemies on at least one of the policy dimensions.
Figure 3.4: SGE2 the case when $\gamma_a > \frac{1}{2}$. The only difference in this picture from 3.2 is the indifference curve of group $a$.

3.3.3 When One Group Has an Intense Policy Demand

I will now change the environment to SGE2. Now that I have demonstrated that it is difficult for interest groups to coalesce when $\gamma_k = \frac{1}{2}$ for all $k$, I will now investigate if it is easier for parties to form when $\gamma_k \neq \frac{1}{2}$ for at least one of the $k$’s. Assume, without loss of generality, that group $a$ cares about issue $x$ the most (i.e. $\gamma_a > \frac{1}{2}$). This is the case when group $a$ has an intense policy demand for policy $x$. Assume everything else about the model is the same. This situation is exemplified in Figure 3.4. Now the indifference curve of group $a$ is ovular instead of circular, which is the only change from Figure 3.2 to Figure 3.4.

**Lemma 10** In SGE2, if groups $b$ and $d$ are running on their own and if $\frac{\pi}{2\pi - 1} \geq \gamma_a$ (or equivalently when $\frac{1}{2 - 2e^{-(\sqrt{2} - 1)x}} \geq \gamma_a$) then interest groups $a$ has an incentive to offer to coalesce with $c$ letting $c$ have its ideal ideal point as the party platform.$^8$

Thus, given a sufficiently high $\pi$, groups $a$ and $c$ will form a party. Now groups $b$ and $d$ are

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$^8$Or one could state the requirement as $\lambda \geq -\frac{\ln(1 - \frac{1}{2})}{(\sqrt{2} - 1)}$. 
facing a choice, consider joining a party amongst themselves to fight the $ac$ party and give up some of their ideology or run on their own and keep their ideological purity but run the risk of losing most of the time to $ac$.

The intuition of $\pi_{3\gamma} - 1 \geq 2$ is very simple. If $\gamma_a = \frac{1}{2}$, then it needs to be the case that $\pi = 1$ for $a$ to be indifferent (which is impossible with the stochastic setup of the model). If $\gamma_a = 1$, then $\frac{1}{2} \leq \pi$ and $a$ will offer to coalesce with $c$ letting it have its ideal point. It may not be obvious why this is. But consider that if $\gamma_a = 1$ then group $a$ group $a$ gets its ideal situation with $\frac{1}{4} + \frac{1}{4} = \frac{1}{2}$ if all groups are running alone and with $\pi$ probability if it is in a coalition with group $c$.

Notice that if $a$ and $c$ form a party, $b$ and $d$ now face an different situations. If party $ac$ wins then $d$ is happy for at least half of $ac$’s party platform, but $b$, on the other hand, if never happy if $ac$ wins. The following lemmas address their preferences for coalescing together versus running on their own.

**Lemma 11** In SGE2, if groups $a$ and $c$ form a party with $c$’s ideal point as the party platform then group $b$ will have an incentive to coalesce with group $d$ splitting the party platform with a coin toss.

**Lemma 12** In SGE2, if groups $a$ and $c$ form a party with $c$’s ideal point as the party platform and if $\lambda > \tilde{\lambda}$, then group $d$ will want to form a coalition with group $b$ where they split the party platform with a coin toss.

**Lemma 13** In SGE2, if groups $a$ and $c$ form a party, group $b$ will never be in a coalition with group $d$ where the party platform is $d$’s ideal point.

Thus, if there is going to be a coalition between $b$ and $d$, it must be one where they split the party platform with a coin toss.

**Lemma 14** In SGE2, if $b$ and $d$ are already in a coin toss coalition, then $a$ will want to coalesce with $c$ using the ideal point of $c$ as the party platform only if $1 - \tau > \frac{\gamma_a}{2}$ (or equivalently when $1 - \frac{1}{1+2e^{-(\sqrt{2} - 1)}\lambda} > \frac{\gamma_a}{2}$).
Lemma 15 In SGE2, if $\lambda > \tilde{\lambda}$ and if groups $b$ and $d$ are running alone then group $a$ will have an incentive to coalesce with group $c$ by splitting the party platform with a coin toss.

Since in SGE2 $\gamma_a > \frac{1}{2}$ this implies that $\frac{3}{4} > \tau$ for $a$ to coalesce with $c$. And since $1 \geq \gamma_a$ this implies that $\frac{1}{2} \geq \tau$. All of the lemmas are in place to prove the major proposition of SGE2. Of course, $b$ and $d$ have no incentive to be in a coalition if $\lambda < \tilde{\lambda}$.

Proposition 16 In SGE2,

1. if $\lambda \geq \tilde{\lambda}$ and $\frac{\pi}{3\pi-1} < \gamma_a$ then the set of strong Nash equilibrium consists of $C = \{(A_c, B_d^s, C_a, D_b^s)\}$; and

2. if $\lambda \geq \tilde{\lambda}$ and $\frac{\pi}{3\pi-1} \geq \gamma_a$ then the set of strong Nash equilibria consists of $C = \{(A_c, B_d^s, C_a, D_b^s), (A_c^l, B_d^s, C_a^l, D_b^s)\}$; and

3. if $\lambda < \tilde{\lambda}$ then the set of strong Nash equilibrium consists of $C = \{(W, W, W, W)\}$.

Proof. If $\lambda \geq \tilde{\lambda}$ and $\frac{\pi}{3\pi-1} < \gamma_a$ then by Lemma 10 group $a$ is not willing to coalesce with group $c$ by letting it have its ideal point as the platform. But by Lemma 15 group $a$ will want to coalesce with group $c$ by splitting the platform with a coin toss. Thus, $a$ and $c$ will form a party. Since everything is the same as in SGE1 for groups $b$ and $d$, by Lemma 5 groups $b$ and $d$ will form a party before groups $a$ and $c$ began to form a party. But now that party $ac$ has been formed Lemma 13 states that group $b$ will never want to form a party with $d$ where the platform is the ideal point of $d$. Lemmas 11 and 12 state that groups $b$ and $d$ will form a party by agreeing to split the platform with a coin toss. Thus, the only stable action profile for a set of coalitions is $(A_c, B_d^s, C_a, D_b^s)$.

If $\lambda \geq \tilde{\lambda}$ and $\frac{\pi}{3\pi-1} \geq \gamma_a$ then by Lemma 10 group $a$ is willing to coalesce with group $c$ by letting it have its ideal point as the platform. But by Lemma 15 group $a$ will also want to coalesce with group $c$ by splitting the platform with a coin toss. Thus, $a$ and $c$ will form a party either by splitting the platform with a coin toss or by $a$ letting $c$ have its ideal point as the party platform. Since everything is the same as in SGE1 for groups $b$ and $d$, by Lemma 5 groups $b$ and $d$ will form a party before groups $a$ and $c$ began to form a party. But now that party $ac$ has been formed Lemma 13 states that group $b$ will never want to form a party with...
where the platform is the ideal point of $d$. Lemmas 11 and 12 state that groups $b$ and $d$ will form a party by agreeing to split the platform with a coin toss. Thus, the only stable action profile for a set of coalitions is \( \{(A_s^1, B_s^1, C_a^s, D_s^b), (A_s^1, B_s^1, C_a^h, D_s^i)\} \).

If $\lambda < \tilde{\lambda}$ then by Lemma 15 group $a$ will not make an offer to $c$, allowing $c$ to have its ideal point as the party platform. Lemma 5 says that groups $b$, $c$, and $d$ will not want to form a party under any circumstances. Thus, the only stable set of parties are the unit parties of each group: $(W, W, W, W)$.

Thus, even when one group has an intense policy demand for one issue it is very difficult for all groups to coalesce without the influence of activists. Groups $a$ and $c$ form a party rather easily. But group $d$ needs $\pi > \frac{1}{2}$ for it to agree to join a coalition with $b$. This is because of the asymmetric situation that the $ac$ coalition creates between $b$ and $d$. Group $b$ is in danger of having his worst outcome happen $\pi$ fraction of the time while group $d$ actually likes half of the outcome when party $ac$ wins. So $d$ is less willing to accept an offer from $b$ unless $\pi$ is relatively high.\(^9\)

But is group $a$ happier when it everyone is running on their own versus when it joins in a coalition with group $c$ and while groups $b$ and $d$ coalesce with a split coin toss platform? To answer this question I have the following proposition. Note that this does not address whether group $a$ is choosing between outcomes $(A_s^1, B_s^1, C_a^s, D_s^b)$ and $(W, W, W, W)$; it only addresses the welfare analysis.

**Proposition 17** In SGE2, if $\gamma_a < \frac{2}{3}$ then group $a$ is worse off in a coalition with group $c$ letting $c$ have its ideal point while $b$ and $b$ coalesce splitting the platform with a coin toss than when all groups are running on their own.

**Proof.** When all groups are running on their own, then group $a$ received $EU_a (W, W, W, W) = -2\theta^2$. When it coalesces with group $c$ and lets it have its ideal point as the party platform and groups $b$ and $d$ coalesce splitting the party platform with a coin toss, then the group $a$ receives

\(^9\)Also one small note about ideology. Groups $a$ and $c$ form not only a political party $ac$ but a corresponding ideology with it: $(-\theta, -\theta)$ or opposition to both $x$ and $y$ policies. In doing so, groups $b$ and $d$ also create an ideology to oppose the $ac$ party ideology which is either $(\theta, \theta)$ or $(\theta, -\theta)$ depending on who wins the coin toss.
\( EU_a(A_c^l, B_d^a, C^h, D_b^e) = -4\theta^2 + 3\gamma_a\theta^2. \) When all groups are running alone, group \( a \) receives

\[
U_a(W,W,W,W) = \frac{1}{4} \left[ -4 (1 - \gamma_a) \theta^2 \right] + \frac{1}{4} \left[ -4 (1 - \gamma_a) \theta^2 - (4\gamma_a\theta^2 + 4 (1 - \gamma_a) \theta^2) \right] = (-3 + 2\gamma_a) \theta^2
\]

Thus, it is the case

\[
EU_a(A_c^l, B_d^a, C^h, D_b^e) > EU_a(W,W,W,W)
\]

\[
-4\theta^2 + 3\gamma_a\theta^2 > -2\theta^2
\]

\[
\gamma_a > \frac{2}{3}.
\]

Thus, when \( \gamma_a = \frac{2}{3} \) group \( a \) is indifferent between outcomes \( (A_c^l, B_d^a, C^h, D_b^e) \) and \( (W,W, W,W) \). So if group \( a \) cares about policy \( x \) enough, it gets a better outcome when the set of strong Nash equilibria consists of coalitional parties. Group \( c \) is obviously better off in this situation because it gets to have its ideal point as the party platform. Group \( d \) is even better off because it gets at least half of its favorite policy, \( y = -\theta \), half of the time plus the other half favorite policy, \( x = \theta \), a quarter of the time. So there is a welfare improvement for both groups \( a, c, \) and \( d \). Group \( b \) is much worse off because it gets the opposite of what it wants, \((-\theta, -\theta)\), half of the time and half of what it wants, \( x = \theta \), a quarter of the time. It only gets exactly what it wants \( \frac{1}{4} \) of the time.

So in summarizing SGE2, making one group have an intense policy demand does not increase the ease in which parties form. The threshold is still the same: \( \lambda = \tilde{\lambda} \) (or \( \pi = \tau = \frac{1}{2} \)). However, in SGE2 parties have become somewhat more natural in the sense that each group now has a obvious coalitional partner if there are going to be coalitional parties.

### 3.3.4 When Two Groups Have an Intense Policy Demand

In the previous section, I have shown that if one of the groups cared mainly about one policy dimension then the creation of large-tent parties still heavily depended on the value of \( \lambda \). Now I will consider examples when there are two groups that care mainly about one dimension. In
SGE3, everything is the same from SGE2 except that now group \( d \) has a intense policy demand for \( x \). Then it follows from the above analysis that groups \( a \) and \( c \) form a coalition with a corresponding policy position of \( (-\theta, -\theta) \) if the conditions for that strong Nash equilibrium is fulfilled, since the conditions for that strong Nash equilibrium depending only on group \( a \)'s preferences and not any of the others. But now that I have made group \( d \) an intense policy demander, I need to carefully analyze how groups \( b \) and \( d \) will react in relation to how groups \( a \) and \( c \) act. It is not obvious that groups \( b \) and \( d \) form a coalition with a resulting policy position of \( (\theta, \theta) \), even if it may seem intuitive that they will do so.

**Lemma 18** In SGE3, when groups \( a \) and \( c \) form a party, \( d \) has an incentive to offer to let \( b \) have its ideal point as the party platform when \( \pi > \frac{\gamma_d}{(3\gamma_d-1)} \) (or equivalently when \( \gamma_d > \frac{1}{2-2e^{-(\sqrt{2}-1)}\lambda} \)).

Notice that \( \gamma_d = 1 \) implies that \( \pi > \frac{1}{2} \) for group \( d \) to want to let \( b \) have its ideal point as the party platform. And as \( \gamma_d \) approaches \( \frac{1}{2} \) from above then it must be the case that \( \pi \) approaches \( 1 \) from below, which is very difficult to accomplish. Using the findings from the previous section, I present the following proposition which gives the intuition of this section.

**Proposition 19** In SGE3, if \( \gamma_a = \gamma_d = 1 \) and if \( \lambda < \bar{\lambda} \) then the set of strong Nash equilibrium consists of \( \mathcal{C} = \{(W, W, W, W)\} \). If \( \lambda > \bar{\lambda} \) then the set of strong Nash equilibrium consists of \( \mathcal{C} = \{(A^l, B^h_d, C^h_a, D^l_b)\} \).

**Proof.** Suppose that \( \lambda < \bar{\lambda} \). Since everything is the same from \( a \)'s perspective from SGE2, Lemma 10 and Lemma 15 imply that group \( a \) will neither want to let \( c \) have its ideal point as the party platform nor coalesce with \( c \) splitting the platform with a coin toss. Lemma 18 implies that group \( d \) will not want to coalesce with group \( b \) by letting \( b \) have its ideal point.

Suppose that \( \lambda > \bar{\lambda} \). Since everything is the same from \( a \)'s perspective from SGE2, Lemma 10 implies that group \( a \) will want to coalesce with group \( c \) and let group \( c \) have its ideal point as the party platform. Lemma 18 implies that group \( d \) will also want to coalesce with group \( d \) now that groups \( a \) and \( c \) have formed a party. Thus, the only stable action profile is \( (A^l_c, B^h_d, C^h_a, D^l_b) \).

So it still matters what the level of \( \lambda \) is (how much influence campaign impact has). This may seem unintuitive with two intense policy demanders. But think of it in terms of, if campaign
impact has little influence, then the intense policy demanders mostly care about how the number of parties running on their preferred ideal point affects the probability that that ideal point is the implemented after the outcome of the election. Consider the following example for some clarity. Suppose that originally only groups $a$ and $c$ form a party with $\pi = 0.4$ and the probability that parties $b$ and $d$ win are both 0.3. Then if $b$ and $d$ decide to form a party also for some reason, then the probability that party $bd$ wins is 0.5, and, consequently, the probability that party $ac$ wins is also 0.5 which is up from the 0.4 chance that it had before. But if $d$ is an intense policy demander, it does not care if it wins or if group $b$ wins as a party: it only cares if policy $x = \theta$ is implemented. This will happen if groups $b$ and $d$ run as a coalition or individually. If groups $b$ and $d$ do run alone, then the probability that $x = -\theta$ is 0.4 and the probability that $x = \theta$ is 0.6. So if $d$ is a completely intense policy demander for issue $x$, it is actually rational for it run on its own because that gives the greatest probability that $x = \theta$.

In summary of SGE3, adding two intense policy demanders has not overcome the barrier of activists having a great amount of influence over the election. The threshold still stands at $\lambda > \tilde{\lambda}$. However, it is worth noting that in SGE3, if $\lambda > \tilde{\lambda}$, the formation of parties is the most natural out of all the simple group environments as opposed to the awkward coalitions in SGE1. Not only does group $a$ have a natural ally in group $c$, but also group $d$ has a natural ally in group $b$. It only did so reluctantly in SGE2. But the question still remains as to how to overcome the barrier of activist influence. To answer that, I now change the whole environment.

### 3.4 The Complex Group Environment

In this section, I transform the environment to a more complex situation, although I will keep many of the elements from the simple group environment. I will call this the Complex Group Environment (CGE). In the previous section, even with two completely intense policy demanders in the environment, the formation of coalitions still depended on $\lambda > \tilde{\lambda}$. In this section, I will have all of the groups be completely intense policy demanders. I will then investigate how the coalitions form. In the previous section, even with two completely intense policy demanders in the environment, the formation of coalitions still depended on $\lambda$. I will focus the analysis to see if this still holds true in this new environment. All of the assumptions from the previous model.
still hold with the following exceptions.

**Assumption 9** Suppose that there are now three policy dimensions, \( x, y, \) and \( z, \) and suppose that there are now six groups.

**Assumption 10** For each of the policy dimensions there is both a proponent and an opponent group. Policy \( x \) has proponent \( a \) and opponent \( \overline{a} \); policy \( y \) has proponent \( b \) and opponent \( \overline{b} \); policy \( z \) has proponent \( c \) and opponent \( \overline{c} \).

**Assumption 11** All of the groups only care about the policy they are either a proponent or an opponent of.

**Assumption 12** Let a position of 1 on a policy space indicate support for that position and position of \(-1\) indicate opposition to that policy.

For example, group \( a \) only cares about policy \( x \) and has an ideal point of 1 on policy dimension \( x \), while group \( \overline{a} \) also only cares about \( x \) but has an ideal point of \(-1\) on policy dimension \( x \).

**Assumption 13** Define the utility function for group \( a \) as

\[
U_a (x) = 1 - \frac{(1 - x)^2}{2} \tag{3.8}
\]

so that \( a \) receives a 1 if \( x = 1 \) and a \(-1\) if \( x = -1 \). The utility functions of the other groups in society are defined in a similar manner for the policy dimension that they care about.

**Assumption 14** All of the groups have an equal amount of activist resources which are equal to 1.

Again, let the independent voter, \( i \), have an ideal point at 0 for all of the dimensions. Assume the same utility function for the independent voters as before. Remember that the probability that party \( k \) will win is

\[
\frac{e^{U_i(k)}}{\sum_{j \in \mathcal{K}} e^{U_i(j)}}, \tag{3.9}
\]

The structure of the game is still simultaneous move.
The first task is to determine if it is rational for two groups to coalesce when all groups are running on their own. The following lemma shows how groups interact with non-enemies. For example, $a$ and $b$ are non-enemies as are $\overline{a}$ and $b$. Define $\pi$ as the probability that party $ab$ wins the election when all other groups are running on their own.

**Lemma 20** In the CGE, when each group is running as its own party if $\pi > \frac{1}{5}$ then all groups have an incentive to coalesce with a non-enemy.

Since $\pi = \frac{e^{\sqrt{2}\lambda}}{e^{\sqrt{2}+4\lambda}}$, when $\lambda = 0$ then $\pi = \frac{1}{5}$. And if $\lambda > 0$ then $\pi > \frac{1}{5}$. So as long as there is some influence of activists, that is when $\lambda > 0$, groups will have an incentive to coalesce. Now what happens when $c$ is considering joining this coalition?

**Lemma 21** In CGE, if two non-enemies are already in a coalition, then a third non-enemy will have an incentive to join their party.

Now what about the case when there are three coalitions? Is it always optimal for groups to form larger coalitions? The following lemma addresses this question.

**Lemma 22** In CGE, when there are three coalitional parties of non-enemies, one of the groups will have an incentive to join another one of the coalitional parties which only has its non-enemies.

What this shows is that three coalitional parties is not possible. The groups will always tend toward two large-tent coalitional parties. Therefore, it is always optimal for groups to coalesce together until there can be no more groups added to the coalition. In this particular case, the maximum number is three because any more than that would mean that two enemies would be in the same coalition. And that would be impossible in this model world.

**Proposition 23** In CGE, the set of strong Nash equilibrium consists of all groups joining one of two parties consisting of non-enemies.

**Proof.** Each group running running alone can the ruled out by Lemma 20. Two groups running while all other groups running alone can be ruled out by Lemma 21. Three parties
of non-enemies can be ruled out because Lemma 22 states that one of the groups will have an
center incentive to leave its current party to join one of the others of its non-enemies to have a better
probability of winning in the election. Thus, the only prospect left is all groups running in two
of the only parties.

Oddly enough the expected utility of all of the groups when parties $abc$ and $\overline{abc}$ are running
against each other is $\frac{1}{2} - \frac{1}{2} = 0$ which is exactly what it was when each of them was running
alone. But it is the incentive to want to outperform your opponent when possible, and when
each party is running alone it is definitely possible.

So, in summary of the CGE, activists hardly need to have any influence for coalitional parties
to appear. The simple fact that each group has a very small chance of winning the election
alone combined with the fact that coalescing with a non-enemy does not acquire any cost to
the group creates the perfect environment for groups to form two large-tent parties. There is
still a multiplicity of possible coalitions. But here at least each group know who they will not
coalesce with: their natural enemy.

### 3.5 Discussion

There are some important lessons which this analysis has brought forth. First, the level of
campaign impact, $\lambda$, is crucial to understanding how groups form coalitions. Campaign impact
is the one thing, in addition to the larger voting bloc, that makes groups want to coalesce
because it increases the probability of winning an election. This leads to the question of how
much groups actually can contribute to their party’s campaign.

Second, if the influence of activists is not enough, then the policy dimensions must be greater
than two and the groups in the society must be greater than six. When there are only four
groups and two policy dimensions, the groups do not want to coalesce even if it is costless (in
terms of policy) to coalesce because it is costly in terms of decreasing the probability of getting
the policy that they want. This was true even when a group cared only about one policy
dimension, which only helped to create one large-tent party. Two intense policy demanders
created the same outcome. It was only in the Complex Group Environment that allowed two-
large tent parties to form without much influence from activists. The reason is because each
group becomes so insignificant as to influence the outcome of the election that forming coalitions is always beneficial.

Third, coalition partners need not be friends to be forced into the same coalition. They just need to be non-enemies or at least half-enemies. Coalitions might be mechanisms for groups to achieve their individual goals rather than a collective effort towards a unified policy. In the case with six or more groups and three or more policy dimensions, any combination of non-enemies sufficed to produce a feasible coalition.

Finally, this model presents a much different setup for coalition formation than the typical Riker (1962) model. Although my model does not go as far as Weingast (1979) and Schwartz (1994) which predicts universalism for pork barrel coalitions, the campaign impact factor says that there is always a benefit for more groups to join the coalition as long as they have resources to contribute and given that there is policy enemy. To see this, change SGE3 to have an extra group, $g$, positioned exactly where group $c$’s ideal point is. Let group $g$ strongly weight issue $y$ over issue $x$. So $g$ is on the opposite end of group $a$, but remember that group $a$ does not care very much about policy $y$. Since $a$ and $c$ are already in a party this coalition already has two members. But since group $g$ does not add any more cost to the coalition but only brings benefits in their activist resources, it is always optimal for groups $a$ and $d$ to let group $g$ into the coalition.

I will be the first to note that this theoretical environment I have created is very specific. Obviously, a more complex environment would be where the other variables are different: perhaps $n_a > n_b$ or perhaps $a$ has a closer ideal point to $i$ than $b$. But studying the effects of these deviations from my model would take much more space, and this paper has already become complex enough for one analysis. I leave studying those effects to future research. I would also note that one often has to make such simplifying assumption as I have in this paper to be able to say anything useful.

3.6 Conclusion

In this paper, I have shown that it is possible for groups in society, under certain conditions, to run as their own party if they care equally about all of the policy dimension. I then showed that
just changing one group to have intense policy demands over one of the issue dimensions did not change the necessity to have strong campaign influence in the model. Furthermore, I showed that even having two intense policy demanders did not change the situation very much; campaign influence remains essential. Finally, when I changed to a complex group environment with three policy dimensions and six groups, the necessity for activists to have a large amount of influence over the election disappeared.

In summary, it is important to note that strategic context in which groups makes decisions matters greatly. Although it may seem immediately obvious that groups will form coalitions, I show that this is hard for them to do. One way in which they can is for activists to have a large amount of influence over the election outcome. Furthermore, the model I develop is fundamentally different from the previous models of coalition formation which focuses on minimum winning coalitions. They need not be in my model.

The reasons why groups form coalitions of interests is, of course, immensely complex. My theory is just one aspect of the process, and one should note the limitations of the analysis when applying it to empirical analysis of the case studies. Perhaps groups do not always consider the strategic implications of their actions. Nevertheless, as long as political scientists like to impose the concept of rationality onto political actors, we will seek to find the rational of why we observe particular behavior.

As an extension of this paper, I wish to investigate how groups shape party system dynamics. I also wish to study when it is rational to observe one group breaking away from its current coalitional partner to run on its own. And there are so many variations on the model that could not go in this paper without making it exceptionally long. But this simple model will hopefully be a starting point.

3.7 Appendix: Proofs of Lemmata

3.7.1 Proofs for Simple Group Environment 1

Proof of Lemma 5. Suppose that all of the groups are in coalitions. Without loss of generality suppose that groups $a$ and $c$ form a party and groups $b$ and $d$ form a party. I want to show that
if \( \tau > \frac{1}{2} \) then \( EU_a(A_a, B_d, C_a, D_b) = U_a(W, B_d, C_a, D_b) \). The utility of group \( a \) is

\[
EU_a(A_a, B_d, C_a, D_b) = \frac{1}{2} \left[ \frac{1}{2} \begin{pmatrix}
a \text{ wins toss} & c \text{ wins toss} \\
0 & -\frac{1}{4} \theta^2
\end{pmatrix}
+ \frac{1}{2} \begin{pmatrix}
b \text{ wins toss} & d \text{ wins toss} \\
-\frac{1}{4} \theta^2 & -\frac{1}{2} (4 \theta^2 + 4 \theta^2)
\end{pmatrix}\right]
\]

\[= -2\theta^2\]

The utility of \( a \) if it breaks away from the coalition to form its own party while keeping everything else constant is

\[
U_a(W, B_d, C_a, D_b) = \frac{1 - \tau}{2} \left[ -\frac{4}{2} \theta^2 \right] + \tau \left[ -\frac{4}{2} \theta^2 - \frac{1}{2} (4 \theta^2 + 4 \theta^2) \right]
\]

\[= -\theta^2 - 2\tau \theta^2\]

Thus, for \( a \) to want to deviate it must be the case that

\[
EU_a(A_a, B_d, C_a, D_b) > U_a(W, B_d, C_a, D_b)
\]

\[-2\theta^2 > -\theta^2 - 2\tau \theta^2
\]

\[\tau > \frac{1}{2}\]

Since the game is symmetric at this point, if this is true for group \( a \) then it is also true for the other groups. If no group wants to unilaterally deviate when \( \tau > \frac{3}{4} \) then all groups staying with their coalitions is a Nash equilibrium. ■

**Proof of Lemma 6.** Without loss of generality, consider groups \( a \) and \( c \) already in a coalition. Now consider group \( b \) joining in a coalition with one of the other groups, which in this case will be \( d \). Suppose that \( d \) is already offering to coalesce with \( b \) by splitting the party platform through a coin toss. Interest group \( b \)'s utility of staying alone is

\[
EU_b(A_a, W, C_a, D_b) = \pi \left[ \frac{1}{2} \left( -\frac{1}{2} 4\theta^2 - \frac{1}{2} 8\theta^2 \right) + \left( 1 - \pi \right) 0 + \left( 1 - \pi \right) \left( -\frac{1}{2} 4\theta^2 \right) \right]
\]

\[= -2\pi \theta^2 - \theta^2\]
If \( b \) and \( d \) form a party, then the utility for \( b \) is

\[
EU_b(A^a, B^d, C^a_d, D^b) = \frac{1}{2} \left[ \frac{1}{2} \right]_{W_{ac} \text{ wins}} - \frac{1}{2} \frac{\theta^2}{2} + \frac{1}{2} \left[ \frac{1}{2} \right]_{W_{bd} \text{ wins}} - \frac{1}{2} \frac{\theta^2}{2} \]

\[(3.14)\]

\[
= -2\theta^2
\]

Then it must be shown that it is rational for \( b \) and \( d \) to not form a party. Group \( b \) will not form a party if

\[
EU_b(A^a, W, C^a_d, D^b) > EU_b(A^a, B^d, C^a_d, D^b)
\]

\[(3.15)\]

\[
-2\pi \theta^2 - \theta^2 > -2\theta^2
\]

\[
\frac{1}{2} > \pi
\]

So \( b \) will want to run on his own if \( \pi > \frac{1}{2} \). This is also true for \( d \) by symmetry and for either \( a \) or \( c \) if groups \( b \) and \( d \) had formed a party.

**Proof of Lemma 7.** Without loss of generality, consider the choice of group \( a \) of running on its own versus joining another party. The expected utility of faction \( a \) of running on its own is

\[
EU_a(W, W, W, W) = \frac{1}{4} \left[ \frac{a \text{ wins}}{0} - \frac{1}{2} \frac{\theta^2}{2} - \frac{1}{2} \frac{\theta^2}{2} - \frac{1}{2} \left( \frac{\theta^2}{2} + \frac{\theta^2}{2} \right) \right]
\]

\[(3.16)\]

\[
= -2\theta^2
\]

If \( a \) is going to join a party it will need to be with either \( b \) or \( c \) since \( d \) is \( a \)'s ideological opposite. If \( a \) will join a party, he will want to flip a coin with his coalition partner since it weakly dominates acquiescing–thus, \( a \) will only choose either \( A^a_k \) or \( A^b_k \). The value for \( a \) of joining a party with \( c \) is

\[
EU_a(A^a, W, C^a_d, W) = \pi \left[ \frac{ac \text{ wins}}{0} - \frac{1}{2} \frac{\theta^2}{2} - \frac{1}{2} \frac{\theta^2}{2} \right]
\]

\[
+ \frac{1 - \pi}{2} \left[ \frac{b \text{ wins}}{1} - \frac{1}{2} \frac{\theta^2}{2} - \frac{1}{2} \frac{\theta^2}{2} \right]
\]

\[(3.17)\]

\[
= 2\theta^2 \pi - 3\theta^2
\]

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Thus, interest group \( a \) will not join a party if
\[
-2\theta^2 > 2\theta^2\pi - 3\theta^2
\]
\[
\frac{1}{2} > \pi
\]
which proves that group \( a \) will only want to choose \( A_a^* \) if \( \pi > \frac{1}{2} \). The same argument applies to all of the other groups as it does to \( a \). Since all of the groups want to do a coin toss, it follows that none of them will be able to choose to take their ideal point (\( a \) will never be able to choose \( A_c^h \)).

### 3.7.2 Proofs for Simple Group Environment 2

**Proof of Lemma 10.** I want to show that if \( \frac{\pi}{3\pi - 1} > \gamma_a \) then \( EU_a (W, W, W, W) < EU_a (A_a^l, W, C_a^h, W) \) since it is obvious that \( c \) will accept the offer from \( a \) to coalesce with it allowing the party to run on its ideal point. The the expected utility for faction \( a \) when running on its own is
\[
EU_a (W, W, W, W) = \frac{1}{4} \left[ \begin{array}{ccc}
\text{a wins} & \text{b wins} & \text{c wins} \\
0 & -4(1 - \gamma_a)\theta^2 & -4(1 - \gamma_a)\theta^2 \\
\text{d wins} & -4\gamma_a\theta^2 & -4\gamma_a\theta^2 + 4(1 - \gamma_a)\theta^2 \\
\end{array} \right] = -2\theta^2.
\]

Faction \( a \)'s utility of this platform is
\[
EU_a (A_a^l, W, C_a^h, W) = \pi \left[ \begin{array}{c}
\text{a wins} \\
-4(1 - \gamma_a)\theta^2 \\
\end{array} \right]
\]
\[
+ \frac{1 - \pi}{2} \left[ \begin{array}{ccc}
\text{b wins} & \text{d wins} \\
-4\gamma_a\theta^2 & -4\gamma_a\theta^2 + 4(1 - \gamma_a)\theta^2 \\
\end{array} \right] = 6\pi\gamma_a\theta^2 - 2\theta^2 - 2\gamma_a\theta^2 - 2\pi\theta^2
\]

Thus
\[
EU_a (A_a^l, W, C_a^h, W) > EU_a (W, W, W, W)
\]
\[
6\pi\gamma_a\theta^2 - 2\theta^2 - 2\gamma_a\theta^2 - 2\pi\theta^2 > -2\theta^2
\]
\[
\frac{\pi}{3\pi - 1} \geq \gamma_a
\]
And naturally interest group \( c \) will always want to accept the offer to join a party with group \( a \) since it gets exactly its ideal point and it only can increase its chances of winning the election.

**Proof of Lemma 11.** The utility for \( b \) to run on its own in this case is

\[
EU_b \left( A^I_c, W, C^h_a, D^s_b \right) = \pi \left[ -\frac{1}{2} \left( 4\theta^2 + 4\theta^2 \right) \right] + \frac{1 - \pi}{2} \left[ -\frac{1}{2} (0) \right] 
\]

\[
= -3\pi\theta^2 - \theta^2
\]

The utility of \( b \) for joining in a coalition with \( d \) where they split the party platform with a coin toss, remembering that parties \( ac \) and \( bd \) both win with probability \( \frac{1}{2} \), is

\[
EU_b \left( A^I_c, B^s_d, C^h_a, D^s_b \right) = \frac{1}{2} \left( -4\theta^2 \right) + \frac{1}{2} \left( -\frac{1}{2} (0) - \frac{1}{2} 4\theta^2 \right) 
\]

\[
= -\frac{5\theta^2}{2}
\]

Thus, \( b \) chooses to join in a coalition with \( d \) splitting the party platform with a coin toss if

\[
EU_b \left( A^I_c, B^s_d, C^h_a, D^s_b \right) > EU_b \left( A^I_c, W, C^h_a, D^s_b \right)
\]

\[
-\frac{5\theta^2}{2} > -3\pi\theta^2 - \theta^2
\]

\[
\pi > \frac{1}{3}
\]

which is always true if \( \lambda > 0 \).

**Proof of Lemma 12.** The utility of \( d \) of running on its own is

\[
EU_d \left( A^I_c, B^s_d, C^h_a, W \right) = \pi \left[ -\frac{1}{2} \left( 4\theta^2 \right) \right] + \frac{1 - \pi}{2} \left[ -\frac{1}{2} \left( 0 \right) \right] 
\]

\[
= -\pi\theta^2 - \theta^2
\]
The utility of \( d \) joining a coalition with \( b \) and splitting the platform with a coin toss is

\[
EU_d (A_c, B^a, C^h_a, D_b^h) = \frac{1}{2} (-2\theta^2) + \frac{1}{2} \left( -\frac{1}{2} \frac{1}{4} \theta^2 \right)
\]

\[
= -\frac{3\theta^2}{2}
\]

Thus, \( d \) will want to join in a coalition with \( b \) if and only if

\[
EU_d (A_c, B^a, C^h_a, D_b^h) > EU_d (A_c, B^a, C^h_a, W)
\]

\[
-\frac{3\theta^2}{2} > -\pi \theta^2 - \theta^2
\]

\[
\pi > \frac{1}{2}
\]

\[\blacksquare\]

**Proof of Lemma 13.** I will show it by contradiction. Suppose that it is possible for \( b \) to coalesce with \( d \) letting \( d \) have its ideal point as the party platform. Then two things must be true. First, it must be true: \( EU_b (A_c, B^l_d, C^h_a, D_b^h) > EU_b (A_c, W, C^h_a, D_b^h) \) and \( EU_b (A_c, B^l_d, C^h_a, D_b^h) > EU_b (A_c, B^l_d, C^h_a, D_b^h) \). The utility of \( b \) from this offer is

\[
EU_b (A_c, B^l_d, C^h_a, D_b^h) = \frac{1}{2} (-4\theta^2) + \frac{1}{2} \left( -\frac{1}{2} \frac{1}{4} \theta^2 \right)
\]

\[
= -3\theta^2
\]

And Lemma 12 shows that \( EU_d (A_c, B^h_d, C^h_a, W) = -\pi \theta^2 - \theta^2 \). Thus, \( b \) will coalesce with \( d \) and let \( d \) have its ideal point as the party platform if

\[
EU_b (A_c, B^l_d, C^h_a, D_b^h) > EU_b (A_c, W, C^h_a, D_b^h)
\]

\[
-3\theta^2 > -\pi \theta^2 - \theta^2
\]

\[
\pi > \frac{2}{3}
\]

And it must also be the case that \( b \) letting \( d \) have its ideal point as the party platform is greater than coalescing and splitting the platform with a coin toss. This means that is must be the case that

\[
EU_b (A_c, B^l_d, C^h_a, D_b^h) > EU_b (A_c, B^l_d, C^h_a, D_b^h)
\]

\[
-3\theta^2 > -\frac{5\theta^2}{2}
\]

\[
5 > 6
\]

75
which is obviously never true. ■

Proof of Lemma 14. Now if $b$ and $d$ join together in a party, the now probability that $ac$ will win the election is $\frac{1}{2}$ by symmetry of party $ac$ and $bd$. Then

$$U_a (A^l_c, B^l_d, C^h_a, D^h_b) = \frac{1}{2} \left[ -4 (1 - \gamma_a) \theta^2 \right]$$

$$- \frac{1}{2} \left[ \frac{4}{2} \gamma_a \theta^2 + \frac{4}{2} (\gamma_a \theta^2 + (1 - \gamma_a) \theta^2) \right]$$

$$= -3 \theta^2 + \gamma_a \theta^2$$

Then

$$U_a (W, B^l_d, C^h_a, D^h_b) = \frac{1 - \tau}{2} \left[ -4 (1 - \gamma_a) \theta^2 \right]$$

$$- \frac{4}{2} \left[ \gamma_a \theta^2 + (\gamma_a \theta^2 + (1 - \gamma_a) \theta^2) \right]$$

$$= -2 \theta^2 + 2 \gamma_a \theta^2 - 2 \tau \theta^2$$

So that $a$ will want to run on its own iff

$$U_a (W, B^l_d, C^h_a, D^h_b) > U_a (A^l_c, B^l_d, C^h_a, D^h_b)$$

$$-2 \theta^2 + 2 \gamma_a \theta^2 - 2 \tau \theta^2 > -3 \theta^2 + \gamma_a \theta^2$$

$$1 - \tau > \frac{\gamma_a}{2}$$

This implies that $a$ will want to form a party with $c$ if and only if $1 - t \leq \frac{\gamma_a}{2}$. ■

Proof of Lemma 15. If groups $b$ and $d$ are running alone, then

$$EU_a (A^s_c, W, C^s_a, W) = \frac{\pi}{2} \left[ \begin{array}{c} \text{ac wins} \\ \text{b wins} \\ \text{d wins} \end{array} \right]$$

$$-4 (1 - \gamma_a) \theta^2$$

$$-4 \gamma_a \theta^2 - (4 \gamma_a \theta^2 + 4 (1 - \gamma_a) \theta^2)$$

$$= (4 \pi \gamma_a - 2 \gamma_a - 2) \theta^2$$

Then for group $a$ to want to coalesce with group $c$ it must be the case that

$$EU_a (A^s_c, W, C^s_a, W) > EU_a (W, W, W, W)$$

$$4 \pi \gamma_a - 2 \gamma_a - 2 > -2$$

$$\pi > \frac{1}{2}$$

■
3.7.3 Proofs for Simple Group Environment

Proof of Lemma 18. If groups $a$ and $c$ have formed a party, then the utility of $d$ of letting $b$ have its ideal point is

\[
EU_d (A_c, B_d, C_a, D_b) = \frac{1}{2} \left( -4 \gamma_d \theta^2 \right) + \frac{1}{2} \left( -4 (1 - \gamma_d) \theta^2 \right)
\]

(3.36)

\[= -2 \theta^2
\]

And if group $d$ runs on its own

\[
EU_d (A_c, B_d, C_a, W) = \pi \left( -4 \gamma_d \theta^2 \right) + \frac{1 - \pi}{2} \left( -4 (1 - \gamma_d) \theta^2 \right)
\]

(3.37)

\[= (-6 \gamma_d \pi - 2 + 2 \gamma_d + 2 \pi) \theta^2
\]

Thus, it must be the case that

\[
EU_d (A_c, B_d, C_a, D_b) > EU_d (A_c, B_d, C_a, W)
\]

(3.38)

\[-2 \theta^2 > (-6 \gamma_d \pi - 2 + 2 \gamma_d + 2 \pi) \theta^2
\]

\[\pi > \frac{\gamma_d}{(3 \gamma_d - 1)}
\]

Complex Group Environment

Proof of Lemma 20. When all groups are running by themselves, and since all of them have equal resources and are an equal distance to the independent voter, then the probability that each one will win is $\frac{1}{6}$. So the probability that party $a$ wins and receives a utility of 1 and the probability that party $\bar{a}$ wins and $a$ receives a utility of $-1$ is $\frac{1}{6}$. Therefore, the expected utility of group $a$ running alone is $\frac{1}{6} - \frac{1}{6} = 0$. By symmetry this is also the expected utility for all of the groups when all of them are running alone.

Now suppose that groups $a$ and $b$ are considering forming a coalition. The probability that the enemies of groups $a$ and $b$ win is $\frac{1-\pi}{4}$ as the probability that party $ac$ loses is split evenly between the four groups that have not coalesced. The utility for both groups $a$ and $b$ being in
such a coalition is
\[ \pi - \frac{1 - \pi}{4} = \frac{5\pi - 1}{4} \] (3.39)

Thus, it is optimal for group \( a \) coalesce with group \( b \) if
\[ \frac{5\pi - 1}{4} > 0 \] (3.40)
\[ \pi > \frac{1}{5} \]

Thus, groups \( a \) and \( b \) will have an incentive to coalesce if all of the other groups are running
alone. By symmetry of the game, all of the other groups will have an incentive to coalesce with
a non-enemy. ■

Proof of Lemma 21. Let the probability of this new coalition winning be defined as \( \pi' \). Using
a similar logic as that of above, then when \( a, b, \) and \( c \) join in a coalition the expected utility of
\( a \) and \( b \) is
\[ \pi' - \frac{1 - \pi'}{3} = \frac{4\pi' - 1}{3} \] (3.41)
Remember that the probability that party \( ab \) wins is \( \pi = \frac{e^{\sqrt{3}\lambda}}{e^{\sqrt{3}\lambda} + 4e^{\lambda}} \) and the probability that \( abc \)
is \( \pi' = \frac{e^{\sqrt{2}\lambda}}{e^{\sqrt{2}\lambda} + 3e^{\lambda}} \). So for this coalition to be better than the one with only \( a \) and \( b \) in it, it must
be the case that
\[ \frac{4\pi' - 1}{3} \geq \frac{5\pi - 1}{4} \] (3.42)
\[ 16\pi' - 15\pi \geq 1 \]
\[ 16 \frac{e^{\sqrt{3}\lambda}}{e^{\sqrt{3}\lambda + 3e^{\lambda}}} - 15 \frac{e^{\sqrt{2}\lambda}}{e^{\sqrt{2}\lambda + 4e^{\lambda}}} \geq 1 \]
which checking for \( \lambda \geq 0 \) is always true. What this shows is that it is optimal for non-enemies
to coalesce together to the maximum amount when the other groups are running on their own.
■

Proof of Lemma 22. To answer this, suppose now that there are three parties, \( \overline{ab}, \overline{bc}, \) and
\( \overline{ac} \). Then all parties have a \( \frac{1}{3} \) chance of winning the election. The expected utility of group \( a \) is
\( \frac{1}{3} - \frac{1}{3} = 0 \). Consider group \( c \) breaking off from party \( \overline{bc} \) and joining party \( ab \). They will only do
this if
\[ \frac{\text{prob } abc \text{ wins}}{e^{\sqrt{3}\lambda} + e^{\sqrt{2}\lambda} + e^{\lambda}} - \frac{\text{prob } \overline{ac} \text{ wins}}{e^{\sqrt{3}\lambda} + e^{\sqrt{2}\lambda} + e^{\lambda}} > 0 \] (3.43)
\[ \sqrt{3} > \sqrt{2} \]
which of course is always true. Thus, it is always optimal for group $c$ to break off from party $\overline{bc}$
to join party $ab$. Then $\overline{b}$ will not stand for this. It will join party $\overline{ac}$ to defend against a major
loss against party $abc$. ■
CHAPTER 4

Who Are the Extremes?

4.1 Introduction

In this paper, I investigate which Americans are relatively moderate versus which are relatively extreme in their political opinions. There is growing evidence that Americans are becoming more politically polarized (Abramowitz and Saunders, 2008; Abramowitz, 2010; McCarty, Poole and Rosenthal, 2006; Voorheis, McCarty and Shor, 2015). But the literature has not yet come to a consensus on what is causing this polarization. There are two theoretical traditions in political science that offer different explanations.

The first is the political economy tradition which views the political world as people fighting over goods. This literature, for example Meltzer and Richard (1981) and Bolton and Roland (1997), states that each citizen should have preferences over taxation according to his cost benefit calculus. If he receives more in government benefits, as is the case with the poor, then he should support higher taxes. If, on the other hand, he receives less in government benefits than he pays in taxes, he should support lower taxes. And this theory is not hard to believe since Corneo and Grüner (2002), McCarty, Poole and Rosenthal (2006), and Voorheis, McCarty and Shor (2015) give empirical evidence that income inequality is a strong cause of political polarization.

The second is the public opinion tradition exemplified by Converse (1964), Zaller (1992), and Lenz (2012). In Zaller’s Receive-Accept-Sample theory, people’s opinions are formed by elites who send cues to well informed citizens. Although his theory does not state explicitly that increases in political knowledge should increase the intensity of support for policies that

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1This viewpoint is not without detractors, for example Fiorina, Abrams and Pope (2011). For a comprehensive discussion on this debate see Fiorina and Abrams (2008).
he identifies with his political party, one can certainly infer this as a natural extension.

But there is a problem with most of the literature which studies how political sophistication influences how extreme a person’s opinions are. Most scholars have not understood the correct way to operationalize political sophistication. I utilize a new measure developed by Freeder, Lenz and Turney (2016) which determines if people truly understand the positions of political parties. Although the question of sophistication causing people to be more extreme has been addressed before (Abramowitz, 2010; Broockman, 2016), it has not been analyze with the new measure of sophistication that I am using or with individual issue areas instead of a general measure of ideology.

Fortunately, the American National Election Survey (ANES) provides three things that I am able to utilize to answer this research question. First, questions on individual policies that allow for a range of responses as opposed to just agree/disagree questions. This will allow me to analyze the extremity of a person’s opinion on a specific issue as opposed to which side they fall on—in a similar way to what Broockman (2016) uses in his data. Second, questions which ask the respondents to place political parties on a ideological spectrum. This will allow me to determine how politically sophisticated each respondent it. Third, the respondents’ bracket of income. This will, of course, allow me to study the effect of income on the extremity of political opinion. Furthermore, the ANES is fairly consistent with these types of questions throughout time. So this will allow me to get a sense of the temporal change of these effects. I study the years 1988, 2004, 2012, and 2016.

I use this data to show that there is evidence to support both the political economy theory and the elite cue theory. However, the political economy hypothesis has a somewhat meager substantive effect an how extreme is person’s opinion on economic issues, especially considering the large excitement the political economy literature gives to it. Moreover, the relatively small effect of income is not robust when controlling for political sophistication. The elite cue hypothesis has very strong evidence. Although the effect is not always as strong in previous years, it has been growing steadily since then to have a very large effect on many issues in 2016. Furthermore, the effect is robust when controlling for the influence of income.
4.2 The Theory

The political economy theory, as stated in Meltzer and Richard (1981), Bolton and Roland (1997), Persson and Tabellini (2000), and specifically McCarty, Poole and Rosenthal (2006), argues that voters have preferences over the tax rate. The main argument of McCarty, Poole and Rosenthal (2006) for why the American population is polarized is based on this political economy model of self-interest which depends on a person’s level of income. To state this formally, I give the simplified model presented in McCarty, Poole and Rosenthal (2006). Consider person $i$’s preferred tax rate, $\tilde{t}_i$, as a function of his income:

$$\tilde{t}_i = 1 - \frac{y_i}{\bar{y}}$$  \hspace{1cm} (4.1)

where $\bar{y}$ is the average income. Since $\bar{y}$ is a constant, an increase in $y_i$ always decreases the preferred tax rate. Thus, according to this formal model and most of the other political economy models like it, as income increases the preferred tax rate decreases. This is because, as a person’s income increases, they rely less on government support and thus have a decreasing marginal return to a higher tax rate. Poor people, on the other hand, receive a lot in government services and do not have to sacrifice much in taxes (since they do not make that much money anyway) compared to how much they receive in government services.

Therefore, if the variable of interest is measuring the extremity to which a person supports or opposes a policy of redistribution of income, the political economy theory predicts a high income person is going to be very extreme in her opposition to redistribution. Moreover, in survey questions which do not directly address redistribution but rather another topic involving a political economy issue, a high income person should be very extreme in her conservative opinion about the issue and a poor person should be very intense in his opposition. These variables include opinions about taxation, spending on social welfare programs, and spending in general. The political economy theory gives the following hypothesis.

**Political Economy Hypothesis** As a person’s income increases, the level of support for conservative political economy issues (lower taxes, less government spending, less government regulation) should also increase.

This theory does not give a prediction about what preferences people will have on other
issues which do not involve economics. The model disregards any aspect of life that does not relate to economics—it does not speak to any aspect of life that does not relate to taxes and spending. Technically it would be a mystery about what a rich people’s opinion on business regulation would be, but since we know empirically that almost all CEOs of large businesses are rich, we might infer that they have conservative positions on these issues as well.

The specific public opinion literature which I have been referring to started with Converse (1964) who studied people’s opinions on specific policy issues. He found that most people do not think about policy issues in a ideological way. He notes that ideology is somewhat hard to grasp for most people, particularly when understanding the relationship between ideology and particular issues. For example, if a person considers himself a conservative, how will he know all of the tenets of conservatism? In Converse’s language, conservatism has certain “constraints” which tell a person how to evaluate and interpret the political world. If one considers himself a conservative, then he should be supportive of lowering taxes as well as be pro-choice according to the tenets of conservatism. But how does a person have a clear understanding which side of an issue to support if he is a conservative?

Zaller (1992) answers this very question by continuing in Converse’s line of thinking, arguing that more informed people will understand the cues from elites if supporting a policy issue is a liberal or conservative stance. The Zaller Receive-Accept-Sample (R-A-S) model states that the higher a person’s political awareness is the more likely he is to take the preferences of the elites that they have on individual issues. But this theory does not state explicitly how extreme a person’s political opinions should be. Although Zaller (1992) does analyze some variables which give a the respondent a range of answers, his main emphasis is not extreme versus moderate opinions.

Before I move forward with a formal statement of my theory, I want to discuss the difference between what I am studying about ideology and what the literature stream of Converse (1964), Zaller (1992), and Lenz (2012) are studying. Their main focus was on the consistency of people’s opinions with elite cues. The receive-accept-sample model only allows for a person to give a liberal versus a conservative answer. My focus is on ideological extremism which is more than a person simply agreeing with a political elite’s opinion. This is why it is important to use measures of public opinion which give people a range of answers from very liberal to very
conservative. It is also why it is important for me to do my analysis using variables which address specific policy issues as opposed to using an overall summary measure of ideology such as the one created by Item Response Theory. Broockman (2016) notes that these types of operationalizations of ideology can put people on the extreme ends of the distribution, and so they would be labeled as extreme in their ideology. But upon closer inspection these extreme people can often just be consistently moderate to one side on all of the items used in the IRT variable. But it is unable to detect when some people have extreme opinions about a certain issue.

I argue that a logical extension of Converse (1964), Zaller (1992), and Lenz (2012) thinking on elite cues is that, the more politically aware a person is, the more he is likely to understand what his ideology means. He, therefore, will be more likely to give an extreme answer to one of these policy specific questions I am using. The argument that politically informed or involved people are more likely to be extreme is not necessarily a new one. It has been at least hinted at and outright argued by some scholars. For example, Fiorina and Levendusky (2006, p. 52) state,

“people who are active in politics know a lot and care a lot about politics and public policy, and their views are organized according to ideological frameworks. In contrast, most ordinary voters have less knowledge about politics, care less about it, and are largely nonideological. Moreover, people who are active in politics tend to have more extreme views than ordinary voters.”

What Fiorina and Levendusky (2006) are arguing is that activists are the ones who are politically extreme and they are the people who influence elected officials—which gives an explanation as to why Congress is so polarized. While this does not exactly lay out the theory of Zaller’s R-A-S model, it hints at it. These involved people which Fiorina and Levendusky (2006) talk about are likely to listen to political elites who identify with their party and agree with their talking points. Thus, if a person is a Democrat, the more sophisticated he is the higher his intensity of support for liberal positions should be.\(^2\) I give a summary statement of this hypothesis as follows.

\(^2\)Zaller (1964) also shows that more politically aware people are more likely to be consistent voters for one party. I see this as another reason to think that politically aware people are often extreme in their political
**Elite Cue Hypothesis** As a person becomes more politically sophisticated, she becomes more conservative on individual issues if she is a Republican and more liberal on individual issues if she is a Democrat.

But how should I define political sophistication? I utilize a new method derived by Freeder, Lenz and Turney (2016). They argue that the public opinion literature has been operationalizing political knowledge incorrectly. The usual way to measure it is through a series of civics textbook knowledge questions: “who is the current Speaker of the House?” or “what is the maximum number of years a president can serve?” Freeder, Lenz and Turney (2016) argue that this is not what Converse (1964) originally theorized when spoke about politically sophisticated people being able to have more stable policy attitudes. He argued that people who know “what goes with what” (people who can bundle the policy positions together in a correct manner in their liberal-conservative places) should be able to have stable policy attitudes because they understand where these policy position stand on the liberal-conservative policy dimension. Freeder, Lenz and Turney (2016) develop a measure of how capable people are at understanding which issue stances are conservative versus which are liberal. They measure how many times a survey respondent correctly places the two major political parties in the right order on the issue dimension of specific policies.

A good social science theory should state when it would be falsified, according to Popperian theory. The political economy hypothesis would be falsified if income is negatively related or completely unrelated to conservative opinions on economic issues. The elite cue theory would be falsified if people’s political awareness was completely unrelated to their ability to answer policy questions which are in line their party ID. For example, a knowledgeable person who is a Democrat not being any more extreme in her political opinions than a unknowledgeable person who is a Democrat. Of course, these two hypotheses are not necessarily mutually exclusive. Thus, I will test both theories as if both could be true concurrently.

Finally, I would like to point out the difference in the empirical analysis between my paper and McCarty, Poole and Rosenthal (2006). Polarization means differences in opinions as opposed to sorting. When analyzing congressional ideology, McCarty, Poole and Rosenthal (2006) use beliefs.
one of the best ways to measure politician ideology: NOMINATE scores. However, when doing
data analysis on the American public, they use proxies for differences in political opinion, such
as the propensity to identify as a Republican. Although these proxies can be very informative,
they are not measuring opinion itself. Furthermore, the proxy variable has the Broockman
(2016) problem of mixing attitudes towards many different policies in one summary measure.
Is a person more likely to identify as a Republican because he is very conservative on economic
issues or because he cares mostly about illegal immigration? A summary measure of ideology
mixes the two. Thus, even they had a more direct measure like NOMINATE for the public they
would still have this problem. My empirical analysis solves both of these problems by using
actual questions on policies so that I am measuring attitudes and not a proxy.

4.3 Operationalizations of the Independent Variables

In this section, I only discuss the constructing of the independent variables. Each of the depen-
dent variables are discussed in the sections in which they are relevant. The data comes from
the American National Election Study. This is the best dataset for the purpose of my study
because it has a list of questions which allow for a range of answers, thus allowing me to mea-
sure extremity of political opinion. Moreover, it asks respondents to rate parties on ideological
continuums for specific issues. This is important for my measure of political sophistication.

There are three different ways I could operationalization political knowledge. The first is
the traditional way, as exemplified by Zaller (1992), which is the amount of civics textbook
knowledge a person holds. And the ANES does have data that allows me to operationalize this
type of political awareness: a list of questions regarding basic to complex political facts. These
include such questions as “how many terms can a president serve?” or “which is the least that
our federal government spends money on: Social Security, national defense, Medicare, or foreign
aid?” If the respondent answered correctly, she received a 1 and if she answered incorrectly she
received a 0. I then sum up all of the numbers for that particular person, a maximum score
would be 12. I then normalize the variable to be in between 0 and 1. This variable is called
knowledge.

The second way I could operationalize political awareness is the level of knowledge of political
positions of the two major political parties that a person holds. Freeder, Lenz and Turney (2016) argue, very convincingly, that this is a better way to operationalize political sophistication in the American public. They do this by measuring how well survey respondents are able to order the positions of the two major political parties on specific issues on the left-right continuum. For this, I follow closely what they do in their analysis, although I do not do it for a panel dataset. The ANES regularly asks respondents about policy issues like “should the federal government guarantee a job?”, “should health insurance be public or private?,” “should the government increase or decrease services?”, and “should the government help blacks financially?” It also asks respondents about defense spending and about left-right ideology generally. Each of these questions is on a 7-point scale. The respondents are asked to place themselves, the presidential candidates, and the Democrat and Republican parties on this scale. To measure a respondent’s knowledge, if she places the Democratic Party to the left of the Republican Party, then she receives a 1. Otherwise she receives a 0. Then all of her points from each of the four scores are added up for a total of 6 possible points. Thus, the range of the pre-normalized sophistication variable goes from 0 (she placed none of the party positions in the right order) to 6 (she placed all of the party positions in the right order). I use all 6 of the items listed above for all the the years studied with the exception of 2004 which does not have the question on insurance. I will call this variable political sophistication, in line with Luskin (1990). The distributions for all of the years studied are shown in Figure 4.1. One can clearly see that political sophistication has been increasing over time, from the distribution being evenly distributed (although somewhat skewed towards the left) in 1988 and the distribution being very skewed toward the right in 2012 and 2016.

The third way to operationalize political awareness is to combine both the first and second ways of operationalization. This could allow for the best of both worlds. However, there is reason to doubt that the first way of measuring political awareness brings much value to the type of analysis that I am doing. The second operationalization is the best way to measure what I lay out in the theory of how people should know what-goes-with-what. Although the first measure is effective at predicting people’s opinion in recent times, it does not for 1988.

---

If the question did not ask about the position of the political parties, then the position of the presidential candidates was used instead as a best alternative.
And combining them may allow the first measure to drown out the effect of the second for these earlier times. I give a more detailed explanation of this in the appendix. Thus, I will utilize the second operationalization of political awareness in the main body of my paper.

One of the main independent variables of interest, due to the political economy hypothesis, is income. The ANES does not report exact income numbers, but rather allows respondents to report their income bracket. To make this a real number, I just take the upper bound between the intervals. Since the income variable is skewed to the right, as it normally is for income, I take the natural log to make it normally distributed. I then normalize the variable to be in between 0 and 1; I call this variable lincome.

I create a variable for a respondent’s party identification. The ANES asks respondents to place themselves on a 7-point scale of party identification from strong Democrat to strong Republican. I create a party ID variable, which runs on a continuum between strong Democrat and strong Republican. I then normalize this variable to be in between 0 and 1. So 0 means a strong Democrat, 0.5 means an independent, and 1 means a strong Republican.

Lastly, some of the regressions require that I control for a person’s race and how religious they are. To control for race, I have dummy variables white for whether or not the respondent is white or not and black for whether or not the respondent is black. If a respondent does not fall into either one of these races then she would fall in the “other” category. For the religious variable, I measure how much a respondent attends church. This is a five step variable which ranges from 1 (every week) to 0 (never).

Most of the variables described here are all measured in the same way throughout all of the years—the only difference would be slight variations in how the questions were asked of the respondents. This gives some ability to compare across years the same measures.

4.4 Economic Issues

To test both the political economy hypothesis and the elite cue hypothesis for economic issues, I construct a dependent variable which summarizes a respondent’s attitude toward economic policies on a liberal-conservative continuum. I use three policy items in the ANES: “should the government guarantee a job/income?,” “should health insurance be public or private?,”
and “should the government increase or decrease government services?” Each of these questions runs on a five point scale from a very conservative answer to a very liberal one. I score a very liberal answer a 1 and a very conservative answer a 5. I then add all three of the variables together to make one large summary measure of how liberal or conservative each respondent is, which I then normalize to make the variable in between 0 and 1. The use of multiple items reduces the amount of measurement error in a variable which measures a person’s opinion—see Ansolabehere, Rodden and Snyder (2008).

The political economy hypothesis states that, as a person’s income increases, her level of economic conservatism should also increase. Since this hypothesis does not predict that party ID has any influence over a person’s economic opinions, I only investigate the bivariate relationship between income and economic conservatism. I attempt to make all of the regressions as simple as possible in line with Achen (2006). This relationship for each year studied is shown in Figure 4.2 (I only show the graphical relationship). The plot shows that there is modest support for the hypothesis. For example, in the year 1988, the coefficient of income is 0.108. The income variable has a range from 0 to 1. That means that if a person making around $3,000 a year increased her income to making $130,000 a year she would increase her economic conservatism by 0.108 or by about 10% of the economic variable. Since the standard deviation of the economic variable is 0.18, this change of the economic variable by changing from the entire range of the income variable is less than one standard deviation.

I now test both the political economy and the elite cue hypothesis simultaneously. To do this, I will control for a person’s party ID, level of sophistication, and the interaction between the two; the results can be seen in Table 4.1. Using this method, income is not strongly positively related to economic conservatism. Although the coefficients are all statistically significant, only for the year 2012 does the coefficient have any real substantive significance—and even that year it is not highly strong. For example, in the year 1988 the coefficient for income is 0.08. This means that a person whose income changes from $3,000 a year to $130,000 only changes in the economic variable by 0.08. This is less than one percent of the variable range. The coefficients for income for 2004 and 2012 essentially the same as in 1988.

The elite cue hypothesis states that the more politically sophisticated a person is, the more likely she is to be economically conservative if she is a Republican and the more likely she is
Table 4.1: The dependent variable is economic conservatism.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.480***</td>
<td>0.492***</td>
<td>0.477***</td>
<td>0.517***</td>
</tr>
<tr>
<td></td>
<td>(0.015)</td>
<td>(0.024)</td>
<td>(0.013)</td>
<td>(0.017)</td>
</tr>
<tr>
<td>lincome</td>
<td>0.083***</td>
<td>0.082***</td>
<td>0.136***</td>
<td>0.089**</td>
</tr>
<tr>
<td></td>
<td>(0.017)</td>
<td>(0.020)</td>
<td>(0.011)</td>
<td>(0.015)</td>
</tr>
<tr>
<td>sophistication</td>
<td>−0.103***</td>
<td>−0.131***</td>
<td>−0.245***</td>
<td>−0.304***</td>
</tr>
<tr>
<td></td>
<td>(0.027)</td>
<td>(0.035)</td>
<td>(0.016)</td>
<td>(0.021)</td>
</tr>
<tr>
<td>pid</td>
<td>0.007</td>
<td>−0.111**</td>
<td>−0.171***</td>
<td>−0.295***</td>
</tr>
<tr>
<td></td>
<td>(0.025)</td>
<td>(0.042)</td>
<td>(0.023)</td>
<td>(0.032)</td>
</tr>
<tr>
<td>sophistication:pid</td>
<td>0.193***</td>
<td>0.344***</td>
<td>0.704***</td>
<td>0.857***</td>
</tr>
<tr>
<td></td>
<td>(0.046)</td>
<td>(0.062)</td>
<td>(0.027)</td>
<td>(0.037)</td>
</tr>
<tr>
<td>R²</td>
<td>0.069</td>
<td>0.099</td>
<td>0.439</td>
<td>0.427</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.067</td>
<td>0.096</td>
<td>0.438</td>
<td>0.426</td>
</tr>
<tr>
<td>Num. obs.</td>
<td>1611</td>
<td>1005</td>
<td>5107</td>
<td>3185</td>
</tr>
<tr>
<td>RMSE</td>
<td>0.176</td>
<td>0.166</td>
<td>0.184</td>
<td>0.195</td>
</tr>
</tbody>
</table>

***p < 0.001, **p < 0.01, *p < 0.05

to be economically liberal if she is a Democrat. The data analysis supports this hypothesis. Remember that I am using a new measure of sophistication developed by Freeder, Lenz and Turney (2016) as opposed to the traditional civics textbook knowledge measure as used by previous studies such as, for example, Zaller (1992). Table 4.1 shows that there is a strong interactive relationship between party ID, sophistication, and how economically conservative a person is throughout all of the years in my data analysis. All of the coefficients for the interaction between sophistication and party ID are statistically significant. Moreover, even though the R-squares for 1988 and 2004 are not very high at all, the ones for 2012 and 2016 are both over 0.42. This is unusually high for a regression involving public opinions. However, the party ID coefficient is negative for all of the years except 1988. This is counterintuitive since it means that the more a person identifies as a Republican the less likely she is to be economically conservative. Since it is important for the reader to have a good grasp of the mechanics of this
Table 4.2: The regressions without the interaction. The dependent variable is econ.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.437***</td>
<td>0.398***</td>
<td>0.233***</td>
<td>0.234***</td>
</tr>
<tr>
<td></td>
<td>(0.011)</td>
<td>(0.017)</td>
<td>(0.009)</td>
<td>(0.013)</td>
</tr>
<tr>
<td>lincome</td>
<td>0.086***</td>
<td>0.082***</td>
<td>0.124***</td>
<td>0.072***</td>
</tr>
<tr>
<td></td>
<td>(0.017)</td>
<td>(0.020)</td>
<td>(0.012)</td>
<td>(0.016)</td>
</tr>
<tr>
<td>sophistication</td>
<td>−0.013</td>
<td>0.027</td>
<td>0.082***</td>
<td>0.071***</td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.020)</td>
<td>(0.010)</td>
<td>(0.014)</td>
</tr>
<tr>
<td>pid</td>
<td>0.099***</td>
<td>0.103***</td>
<td>0.385***</td>
<td>0.393***</td>
</tr>
<tr>
<td></td>
<td>(0.013)</td>
<td>(0.016)</td>
<td>(0.008)</td>
<td>(0.010)</td>
</tr>
<tr>
<td>R²</td>
<td>0.059</td>
<td>0.072</td>
<td>0.366</td>
<td>0.333</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.058</td>
<td>0.069</td>
<td>0.366</td>
<td>0.332</td>
</tr>
<tr>
<td>Num. obs.</td>
<td>1611</td>
<td>1005</td>
<td>5107</td>
<td>3185</td>
</tr>
<tr>
<td>RMSE</td>
<td>0.177</td>
<td>0.169</td>
<td>0.195</td>
<td>0.210</td>
</tr>
</tbody>
</table>

***p < 0.001, **p < 0.01, *p < 0.05

regression analysis, I will spend some time doing in-depth analysis of this strange result.

I choose somewhat arbitrarily the year 2012 to focus my analysis. Table 4.2 shows that the regression with only the party ID variable and not the interaction term results in a party ID coefficient which is positive and substantively significant. Thus, it is not party ID per se which has a negative relationship with economic conservatism. So why does this coefficient become negative when the interaction is present in the regression? The answer lies in the theory of the elite cue hypothesis itself. If unsophisticated people are not able to tell if Republicans are more conservative than Democrats, they are unlikely to understand what their own position on economic issues should be based on their partisan identity. Thus, it is quite possible for unsophisticated Democrats to actually be more conservative (in the sense that they have any ideology at all) than unsophisticated Republicans. Figure 4.3 actually shows that this is true.

For specifically this picture, I will define unsophisticated people as those receiving a score of 0 (placing none of the parties in the correct order) on the sophistication variable and sophisticated people as those receiving a 1 (placing the parties in the correct order on every questions).
Here I subset the data into four groups: unsophisticated Democrats, sophisticated Democrats, unsophisticated Republicans, and sophisticated Republicans. One can see that unsophisticated Democrats are somewhat normally distributed across the econ spectrum. Unsophisticated Republicans are not quite normally distributed, but they are still spread throughout the spectrum of the economic variable. On the other hand, sophisticated Democrats are clustered on the left and sophisticated Republicans are clustered around the right. Thus, unsophisticated partisans are confused about what they should believe whereas sophisticated partisans understand where their party stands and usually follow in its platform to the extreme extent on economic issues.

To further exemplify this, I will break up the data by party ID and run a regression for each set of party identifiers (which includes people who state that they lean either Republican or Democrat). The results can be seen in Table 4.3. I show the plot for the regression between strong Democrats and strong Republicans from Table 4.1 alongside the plot for the regression lines for Democrats and the lines for Republicans in the split data shown in Table 4.3. One can clearly see that the results are very similar. This leads me to conclude that the regression results found in Table 4.1 are correct. I interpret this result to mean that party ID itself does not separate people on economic issues very well. Rather, it is the interaction between party ID and sophistication. When one controls for this interaction, as I have done in Table 4.1, the effect of party ID essentially goes away.

I will analyze the results for the split data shown in Table 4.3 in detail to get a sense of the substantive effect of political sophistication. I also plot the regression lines of this table for the effect of sophistication in Figure 4.5. For the year 1988, the coefficient for sophistication for either Democrats or Republicans is not very high: -0.08 and 0.07 respectively. This means that, in the year 1988, if a person goes from being very unsophisticated (sophistication equal to 0) to very sophisticated (sophistication equal to 1) her economic conservatism only decreases by about 0.08 if she is a Democrat and increases about 0.7 if she is a Republican. For the year 2004, the slope for Democrats remains essentially the same, but the coefficient for Republicans increases to 0.17. The marginal effect is much larger for Democrats in the year 2004, in which the slope for sophistication is -0.165. The marginal effect for Republicans has greatly increased by this time to 0.37. This trend continues through 2016, in which the coefficient for Democrats is -0.22 and the coefficient for Republicans is 0.434. Consider the fact that in 2016 the standard deviation
<table>
<thead>
<tr>
<th>Year</th>
<th>Dem 1988</th>
<th>ANES 2004</th>
<th>ANES 2016</th>
</tr>
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<tr>
<td></td>
<td>Intercept</td>
<td>Dem</td>
<td>Rep</td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.017)</td>
<td>(0.027)</td>
</tr>
<tr>
<td></td>
<td>0.473***</td>
<td>0.502***</td>
<td>0.508***</td>
</tr>
<tr>
<td></td>
<td>0.270***</td>
<td>0.016</td>
<td>0.104***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.016)</td>
<td>(0.022)</td>
</tr>
<tr>
<td></td>
<td>income</td>
<td>0.111***</td>
<td>0.046</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.028)</td>
<td>(0.025)</td>
</tr>
<tr>
<td></td>
<td>sophistication</td>
<td>0.113**</td>
<td>0.073**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.024)</td>
<td>(0.025)</td>
</tr>
<tr>
<td></td>
<td>0.082***</td>
<td>0.081</td>
<td>0.280</td>
</tr>
<tr>
<td></td>
<td>0.073**</td>
<td>0.081</td>
<td>0.280</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.034)</td>
<td>(0.034)</td>
</tr>
<tr>
<td></td>
<td>R²</td>
<td>0.033</td>
<td>0.033</td>
</tr>
<tr>
<td></td>
<td>Adj. R²</td>
<td>0.034</td>
<td>0.034</td>
</tr>
<tr>
<td></td>
<td>Num. obs.</td>
<td>767</td>
<td>692</td>
</tr>
<tr>
<td></td>
<td>RMSE</td>
<td>0.182</td>
<td>0.170</td>
</tr>
</tbody>
</table>

Table 4.3: The dependent variable is economic conservatism.
Table 4.4: The dependent variable is opposition to redistribution.

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.457***</td>
<td>0.393***</td>
</tr>
<tr>
<td></td>
<td>(0.011)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>lincome</td>
<td>0.260***</td>
<td>0.125***</td>
</tr>
<tr>
<td></td>
<td>(0.019)</td>
<td>(0.017)</td>
</tr>
<tr>
<td>pid</td>
<td>−0.064</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.034)</td>
<td></td>
</tr>
<tr>
<td>sophistication</td>
<td>−0.040</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.023)</td>
<td></td>
</tr>
<tr>
<td>pid:sophistication</td>
<td>0.551***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.041)</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.038</td>
<td>0.265</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.038</td>
<td>0.264</td>
</tr>
<tr>
<td>Num. obs.</td>
<td>4981</td>
<td>4971</td>
</tr>
<tr>
<td>RMSE</td>
<td>0.321</td>
<td>0.281</td>
</tr>
</tbody>
</table>

***p < 0.001, **p < 0.01, *p < 0.05

of the economic conservatism variable is 0.257. Thus, a one unit change in the sophistication variable causes a change in the economic conservatism variable by over one standard deviation of its distribution. This is definitely substantively significant, and much more so than it was in 1988. So, over time, the effect of political sophistication has been increasing greatly for identifiers of both parties.

One of the most salient issues in recent times has been the topic of economic inequality in America. Respondents were asked to rate on a scale how much they agree with the statement that the government should decrease income inequality on a scale from 1 (strongly favor) to 5 (strongly oppose). I normalize this variable to be in between 0 and 1 like all of the others. This is the most direct test of the political economy hypothesis because the question specifically asks respondents their opinion about income redistribution. The results of the regression of income and knowledge are presented in Table 4.4, which shows in Model 1 that income is
positively related to opposition to redistribution. Furthermore, it is statistically and substantively significant. This results gives support for the political economy hypothesis. Although the effect diminishes when I add sophistication, party ID, and the interaction between them, it is still statistically and substantively significant. A person whose income changes from $3,000 a year to $130,000 will increase her opposition to redistribution by 0.125. Political sophistication has a positive and statistically and substantively significant effect for Republicans. A one unit change in sophistication will increase a person’s opposition to redistribution by 0.511. However, surprisingly, sophistication has a very small effect for Democrats. A one unit increase in sophistication decreases a person’s opposition to redistribution by only 0.04. So it is actually Republicans who are very responsive to elite cues when it comes to redistribution.

Taking all of the evidence together, there is some evidence that income has an effect on a person’s attitude towards economic issues. Although this effect decreases significantly in the economic variable when I control for the interaction between sophistication and party ID, the effect is still statistically and substantively significant when I analyze the specific issue of redistribution. Political sophistication, on the other hand, nearly always has a very large effect. Although the substantive effect was not very large in 1988, it has steadily grown since then to be very large in the year 2016.

4.5 Race and Immigration Issues

Since racial issues towards African-Americans are an important aspect of American politics, I construct a racial resentment variable using a similar methodology that I used to construct the economic variable. I follow closely the advice of Carmines, Sniderman and Easter (2011) about what type of items to use in its construction. They analyze the different types of items which are often used to analyze racial resentment. They argue that one should use variables which actually measure racial resentment rather than attitudes towards racial policies. The racial resentment variable takes as input for items: “blacks should work their way up without any special favors,” “generations of slavery and discrimination have created conditions that make it difficult for blacks to work their way out of the lower class,” “over the past few years, blacks have gotten less than they deserve,” and “it’s really a matter of some people not trying hard
Table 4.5: The dependent variable is racial resentment.

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.610***</td>
<td>0.664***</td>
<td>0.725***</td>
<td>0.654***</td>
</tr>
<tr>
<td></td>
<td>(0.028)</td>
<td>(0.030)</td>
<td>(0.013)</td>
<td>(0.020)</td>
</tr>
<tr>
<td>sophistication</td>
<td>−0.213***</td>
<td>−0.255***</td>
<td>−0.213***</td>
<td>−0.364***</td>
</tr>
<tr>
<td></td>
<td>(0.028)</td>
<td>(0.041)</td>
<td>(0.015)</td>
<td>(0.023)</td>
</tr>
<tr>
<td>pid</td>
<td>−0.009</td>
<td>−0.022</td>
<td>−0.052*</td>
<td>−0.032</td>
</tr>
<tr>
<td></td>
<td>(0.026)</td>
<td>(0.048)</td>
<td>(0.023)</td>
<td>(0.034)</td>
</tr>
<tr>
<td>white</td>
<td>0.095***</td>
<td>0.049*</td>
<td>0.013</td>
<td>0.018</td>
</tr>
<tr>
<td></td>
<td>(0.026)</td>
<td>(0.020)</td>
<td>(0.007)</td>
<td>(0.013)</td>
</tr>
<tr>
<td>black</td>
<td>−0.095***</td>
<td>−0.122***</td>
<td>−0.155***</td>
<td>−0.135***</td>
</tr>
<tr>
<td></td>
<td>(0.029)</td>
<td>(0.024)</td>
<td>(0.010)</td>
<td>(0.016)</td>
</tr>
<tr>
<td>sophistication:pid</td>
<td>0.217***</td>
<td>0.346***</td>
<td>0.352***</td>
<td>0.498***</td>
</tr>
<tr>
<td></td>
<td>(0.049)</td>
<td>(0.072)</td>
<td>(0.028)</td>
<td>(0.041)</td>
</tr>
</tbody>
</table>

R²            | 0.150         | 0.226         | 0.234         | 0.307         |
Adj. R²       | 0.147         | 0.222         | 0.234         | 0.306         |
Num. obs.     | 1739          | 1050          | 5483          | 3624          |
RMSE          | 0.199         | 0.202         | 0.201         | 0.235         |

***p < 0.001, **p < 0.01, *p < 0.05

enough; if blacks would only try harder they could be just as well off as whites.” All of these variables are on a five point scale ranging from agree strongly to disagree strongly. For each of these variables, I give the most liberal position a 1 and the most conservative a 5. I then normalize the variable so that it lies in between 0 and 1.

The elite cue hypothesis states that, as political sophistication increases, a respondent’s racial resentment should also increase if the respondent is a Republican but should also decrease if she is a Democrat. The results of the regressions are shown in Tables 4.5. All of the interaction coefficients are statistically significant for all of the years of my data analysis. As with Table 4.1, the party ID variable is negative for most of the years. So I will split up the data as I did when analyzing the economic variable. The results are shown in Table 4.6 and the graphs for the effect
Table 4.6: The dependent variable is racial resentment.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dem</td>
<td>Rep</td>
<td>Dem</td>
<td>Rep</td>
<td>Dem</td>
<td>Rep</td>
</tr>
<tr>
<td>(Intercept)</td>
<td>0.603***</td>
<td>0.656***</td>
<td>0.652***</td>
<td>0.688***</td>
<td>0.677***</td>
<td>0.600***</td>
</tr>
<tr>
<td></td>
<td>(0.034)</td>
<td>(0.051)</td>
<td>(0.034)</td>
<td>(0.033)</td>
<td>(0.022)</td>
<td>(0.026)</td>
</tr>
<tr>
<td>sophistication</td>
<td>−0.182***</td>
<td>−0.014</td>
<td>−0.221***</td>
<td>0.018</td>
<td>−0.316***</td>
<td>0.072***</td>
</tr>
<tr>
<td></td>
<td>(0.026)</td>
<td>(0.025)</td>
<td>(0.036)</td>
<td>(0.033)</td>
<td>(0.022)</td>
<td>(0.022)</td>
</tr>
<tr>
<td>white</td>
<td>0.101**</td>
<td>0.034</td>
<td>0.073*</td>
<td>0.025</td>
<td>−0.016</td>
<td>0.048*</td>
</tr>
<tr>
<td></td>
<td>(0.034)</td>
<td>(0.052)</td>
<td>(0.030)</td>
<td>(0.028)</td>
<td>(0.018)</td>
<td>(0.022)</td>
</tr>
<tr>
<td>black</td>
<td>−0.100**</td>
<td>−0.086</td>
<td>−0.107**</td>
<td>−0.154**</td>
<td>−0.146***</td>
<td>−0.195***</td>
</tr>
<tr>
<td></td>
<td>(0.036)</td>
<td>(0.064)</td>
<td>(0.033)</td>
<td>(0.056)</td>
<td>(0.020)</td>
<td>(0.037)</td>
</tr>
<tr>
<td>R²</td>
<td>0.166</td>
<td>0.013</td>
<td>0.168</td>
<td>0.032</td>
<td>0.140</td>
<td>0.046</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.163</td>
<td>0.009</td>
<td>0.163</td>
<td>0.025</td>
<td>0.139</td>
<td>0.045</td>
</tr>
<tr>
<td>Num. obs.</td>
<td>833</td>
<td>728</td>
<td>507</td>
<td>443</td>
<td>1673</td>
<td>1480</td>
</tr>
<tr>
<td>RMSE</td>
<td>0.213</td>
<td>0.183</td>
<td>0.221</td>
<td>0.175</td>
<td>0.251</td>
<td>0.207</td>
</tr>
</tbody>
</table>

***p < 0.001, **p < 0.01, *p < 0.05
of sophistication on racial resentment are plotted in Figure 4.6. The effect of sophistication on racial resentment was not very substantive for Republicans in 1988. A one unit change in the sophistication variable decreases the racial resentment variable by only 0.007. Although this relationship goes in the opposite direction that the elite cue hypothesis predicts, the effect is negligible and statistically insignificant. However, for Democrats, political sophistication has a very large effect in 1988. A one unit change in the sophistication variable decreases the racial resentment variable by 0.185 or by 18.5% of the range of racial resentment. Given that the standard deviation of racial resentment is 0.216, this is a relatively large change. The large effect for Democrats continues throughout the years of my data analysis. Political sophistication also begins to have an increasingly significant effect on racial resentment for Republicans as the years progress. But Figure 4.6 shows that the Republican regression line remains much less steep than the Democrat one. So in general, sophistication has had an increased influence over time, but much more with Democrats than with Republicans. This means that Democrats are much more likely to follow the cue of their partisan elites on racial issues towards blacks whereas Republicans are consistently more conservative regardless of their level of sophistication.

Although immigration does not address race directly (people from all races immigrate to America), it has a very strong undertone of attitudes towards Hispanics and sometimes towards muslims. I construct a variable similar to the racial resentment one, only instead of addressing racial attitudes towards blacks it addresses attitudes towards immigration. These items include three ANES items related to immigration. The first asks respondents what the U.S. government’s policy toward immigration should be. The answers range on a 4-point scale from, “make all immigrants felons and send them back to their home country” to “allow immigrants to remain and eventually quality for U.S. citizenship without penalty.” The second item asks, “what should immigration levels be?” and the answers on a 5-point scale range from “increased a lot” to “decreased a lot.” The third item asks, “how likely will immigration take away jobs?” where the answers range on a 4-point scale from “extremely likely” to “not likely at all.” To construct the immigration variable, I add these three item scores together to create a summary measure of attitudes towards immigration. I then normalize the variable between 0 and 1.

The results for the immigrant variable for the year 2016 are shown in Table 4.7 and in Figure 4.7. I go straight to breaking up the data by party ID. Both of these show that political
sophistication has no effect on how Republicans think about immigration, much in the same way as it did with racial resentment in 1988. Republicans are just consistently more conservative on immigration than Democrats regardless of their level of sophistication. Democrats have a much stronger relationship. A one unit change in the sophistication variable decreases a Democrat’s level of conservatism on immigration by 0.225 or my about 23% of the immigration variable. This is actually one standard deviation of the immigration variable, so it is very substantial. Political sophistication has much less of an effect on the attitudes of Republicans on immigration than it does with the other variables but the effect for Democrats remains very strong.

Taking all of the evidence together, it seems that political sophistication can in same cases have both a statistically and substantively significant effect on a person’s attitudes race. This effect is dependent on both party ID and the year of the ANES survey. Sophistication did not have any real effect for Republicans in 1988 on their feelings towards African-Americans, but it has a rather strong effect in 2016. Sophistication, surprisingly does not have a strong effect on people’s feeling toward immigration in the year 2016, which is very surprising given that it was

Table 4.7: Regression results for immigration for the year 2016.

<table>
<thead>
<tr>
<th></th>
<th>Democrats</th>
<th>Republicans</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.529***</td>
<td>0.536***</td>
</tr>
<tr>
<td></td>
<td>(0.018)</td>
<td>(0.026)</td>
</tr>
<tr>
<td>sophistication</td>
<td>-0.225***</td>
<td>-0.013</td>
</tr>
<tr>
<td></td>
<td>(0.018)</td>
<td>(0.021)</td>
</tr>
<tr>
<td>white</td>
<td>0.055***</td>
<td>0.106***</td>
</tr>
<tr>
<td></td>
<td>(0.015)</td>
<td>(0.023)</td>
</tr>
<tr>
<td>black</td>
<td>0.081***</td>
<td>-0.029</td>
</tr>
<tr>
<td></td>
<td>(0.017)</td>
<td>(0.037)</td>
</tr>
<tr>
<td>R²</td>
<td>0.099</td>
<td>0.021</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.097</td>
<td>0.019</td>
</tr>
<tr>
<td>Num. obs.</td>
<td>1638</td>
<td>1471</td>
</tr>
<tr>
<td>RMSE</td>
<td>0.203</td>
<td>0.203</td>
</tr>
</tbody>
</table>

***p < 0.001, **p < 0.01, *p < 0.05
### Table 4.8: The dependent variable is support for abortion.

<table>
<thead>
<tr>
<th></th>
<th>Democrats</th>
<th>Republicans</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>0.597***</td>
<td>0.513***</td>
</tr>
<tr>
<td></td>
<td>(0.017)</td>
<td>(0.027)</td>
</tr>
<tr>
<td>sophistication</td>
<td>−0.380***</td>
<td>−0.055</td>
</tr>
<tr>
<td></td>
<td>(0.022)</td>
<td>(0.032)</td>
</tr>
<tr>
<td>relig.churchoft</td>
<td>0.140***</td>
<td>0.252***</td>
</tr>
<tr>
<td></td>
<td>(0.013)</td>
<td>(0.015)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.139</td>
<td>0.130</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.138</td>
<td>0.129</td>
</tr>
<tr>
<td>Num. obs.</td>
<td>2845</td>
<td>1846</td>
</tr>
<tr>
<td>RMSE</td>
<td>0.317</td>
<td>0.396</td>
</tr>
</tbody>
</table>

$***p < 0.001$, $**p < 0.01$, $*p < 0.05$

Another salient issue in American politics address what the religious right would call morality. In this section, I test the elite cue theory for abortion. Unfortunately the ANES does not have a good measure that will allow me to measure opinion about abortion throughout time as I did with the economic and racial resentment variable. In the year 2012, however, the ANES has a variable which allows for a broad range of answers. The questions asks if respondents favor a great deal making abortion legal for nonfatal health risk of the mother (a 1 on this scale) or oppose this a great deal (a 9 on this scale). Thus, the pre-normalized variable runs from 1 to 9, but I normalize it to be in between 0 and 1. I control for how often the respondent attends church.

I break up the data into Democrat and Republican party identifiers as I did before. The results are shown in Table 4.8. There is a statistically insignificant and very small effect for Republican party identifiers. If the coefficient is correct—and there is a large standard error—
then a one unit increase in the sophistication variable decreases a Republican’s opposition for abortion by 0.05. Democrats, on the other hand, have a very large effect. A one unit increase in the sophistication variable decreases a Democrats opposition to abortion by 0.38. Since the standard deviation of the abortion variable is 0.385, this change is essentially one standard deviation of this variable.

In summary, political sophistication has very little effect on the opinion of Republicans on abortion. They are simply consistently conservative on abortion with a lot of influence from their religiosity. But sophistication it has a very large effect on Democrats.

4.7 Discussion

The motivation of this paper is to study the theories that claim to explain the cause of political polarization in America. Taking this back to the political economy literature and especially to McCarty, Poole and Rosenthal (2006) and Voorheis, McCarty and Shor (2015) who find empirical evidence for the political economy hypothesis, I would agree with them that income inequality is a driving force in political polarization. However, it cannot explain the vast amount of polarization that they analyze. Income may not have the great effect on political preferences which the political economy literature gives it.

There is very strong evidence that people are taking cues from elites to become more extreme in their opinions. Although political sophistication does not always effect the level of extremity of opinion for Republican party identifiers, it always made Democrat party identifiers more extreme in their opinions. I found this to be true for economic and racial issues throughout time. I also found it to be true for immigration and abortion issues in more recent times. This is not what Broockman (2016, p. 202) discovered when he found a nonexistent (or even negative) relationship between political knowledge and ideological extremism on individual policy issues, but he uses a more extensive measure of extreme opinions. On the other hand, it reinforces the Abramowitz (2010a) notion that more engaged people are more politically extreme—although I am measuring political engagement in a much different way in which he does.

One thing is a clear conclusion from this research. The new way of measuring political sophistication, developed Freeder, Lenz and Turney (2016) and based on what Converse (1964)
actually meant when he defined the concept, is definitely an important breakthrough finding. I find that it is a crucial way of understanding how extreme people’s opinions are. There are other competing measures. But, as I show in the appendix, this was the best choice among the alternatives. And it will very likely be an important variable for future public opinion research.

In doing further research on the polarization of the American public, when deciding whether to focus on income or on political sophistication as a cause of polarization, I would recommend focusing on political sophistication. This does not necessarily invalidate the totality of what McCarty, Poole and Rosenthal (2006) study, since their book is mostly empirical in nature. I simply do not address their data analysis, which, as far as I can tell, still holds true. But I would say it brings serious doubt to the theory that income has a very strong relationship with extreme political beliefs. The relationship is not very strong, and economic opinions are only a part of what makes people conservative or liberal.

4.8 Conclusion

The research question of this paper is who is relatively moderate versus who is relatively extreme in their political views. I have brought together two different literatures which give different theoretical explanations (and which do not usually interact with one another): the political economy school of thought and the public opinion school of thought. The political economy tradition hypothesizes that people base their attitudes on economic policies according to their level of income. The public opinion tradition hypothesizes that people, depending on how politically sophisticated they are, base their opinions on elites of their political affiliation sending them cues about how to think about particular policy issues.

I have found evidence of both theories. However, the political economy hypothesis has a very weak effect on how extreme a person’s opinions are on economic issues. In contrast, using a new measure of political sophistication recently developed in the literature, I find that this new measure has a strong relationship on how extreme a person’s attitudes are. This relationship is robust throughout time, although it seems to be getting stronger in recent years. It is also has a strong effect for many different areas (economics, racial issues, immigration, and abortion). But sometimes the effect is not as strong for Republicans as it is for Democrats.
I conclude that both income and elite cues have some effect of how extreme Americans are in the political opinions. This research can be a stepping stone for others to think about more elaborate methods to tease out what causes people to be politically extreme. This would call into question the extent to which the literature, particularly McCarty, Poole and Rosenthal (2006), emphasize the role that inequality plays in political polarization. Indeed, perhaps inequality does play a major role, but it is just not through majority politics in which we observe the US Congress become to polarized. Special interests of the rich may be key, especially when recent research has suggested this is the case (Gilens, 2012; Gilens and Page, 2014).

4.9 Appendix

4.9.1 The Progress of Political Sophistication Over Time

Because political sophistication differs drastically from the 1980s until recent times, it will be helpful to analyze in great detail the particular items in the sophistication measure to understand what is causing the progression. The percentage of false and correct answers for each item given in the sophistication variable is show in Table 4.9. One can clearly see that Americans have become more sophisticated in terms of correctly ordering the ideology of both of the parties on each of the items in the measure. Why might this be?

It might be that the two political parties are becoming more recognizably distinct in their political positions. This could be due the political polarization of the two parties and their respective politicians. So a person who has the same level of cognition in the year 1988 as he does in 2016 is able to better recognize which sides the parties take on most of the policy items in the variable. If this is the case, then the political scientist who devised the famous Responsible Theory of Party Government would be very proud at this moment in time.

Or it could be that the public is becoming much more politically sophisticated. So, even if the parties did not diverge ideologically, more people are still able to tell which side of the issue the parties take on these policies.

It probably is a combination of both. My paper does not address this issue directly. The important thing to see if that the distribution is moving from being heavily lower tailed to being heavily upper tailed.
Table 4.9: The percent of correct answers for the knowledge items.

<table>
<thead>
<tr>
<th>year</th>
<th>jobs</th>
<th>health</th>
<th>services</th>
<th>aid blacks</th>
<th>defense</th>
<th>ideology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>44.22</td>
<td>42.50</td>
<td>12.65</td>
<td>21.03</td>
<td>55.29</td>
<td>52.16</td>
</tr>
<tr>
<td>2004</td>
<td>63.28</td>
<td>15.68</td>
<td>57.10</td>
<td>68.81</td>
<td>69.22</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>73.06</td>
<td>75.70</td>
<td>77.16</td>
<td>72.32</td>
<td>60.53</td>
<td>73.81</td>
</tr>
<tr>
<td>2016</td>
<td>74.27</td>
<td>74.35</td>
<td>75.20</td>
<td>76.98</td>
<td>67.47</td>
<td>77.28</td>
</tr>
</tbody>
</table>

4.9.2 Which Information Measure to Use?

There are two main competing alternatives to use for the political sophistication variable in the data analysis: the civics textbook knowledge variable and the what-goes-with-what variable that Freeder, Lenz and Turney (2016) develop. And there is a third choice which is to combine the two into one big measure of political information.

One way to select one is to observe the predictive power of each variable. Figure 4.8 for the year 2016 shows that both civics textbook knowledge and party position information have an effect on the extremity of a person’s economic conservatism. However, Figure 4.9 shows that for the year 1988 that civics textbook information does not have any predictive power for how economically conservative a person is. Party position information, on the other hand, does have an effect. Thus, it might make sense to combine both the civics textbook information and the party position information measures into one big measure for political sophistication. In fact, Figure 4.8 shows that this combination actually does have much predictive power in the year 2016. But if I combine both of these for the year 1988, Figure 4.9 shows that this measure will drown out the effect of party position information for this year. This drowning out would make it seem like the party position information does not have any effect when in fact it does.
Figure 4.1: The distribution of the sophistication variable throughout the years.
Figure 4.2: The bivariate regressions for the economic variable.

ANES 1988

slope = 0.1077

ANES 2004

slope = 0.0867

ANES 2012

slope = 0.2156

ANES 2016

slope = 0.1631
Figure 4.3: The different economic attitudes between unsophisticated people and sophisticated people.
Figure 4.4: The different regression lines between the whole and the split data.

2012 Whole Data

- Strong Republicans
- Strong Democrats

2012 Split Data

- Republicans
- Democrats
Figure 4.5: Regression for the economic variable for years 1988, 2004, 2012, and 2016.
Figure 4.6: Regression for the racial resentment variable for years 1988, 2004, 2012, and 2016.
Figure 4.7: Regression for the racial immigration variable for the year 2016.
Figure 4.8: The difference between the alternative measures of political information for 2016.
Figure 4.9: The difference between the alternative measures of political information for 1988.

Civics Information

Party Position Information

Civics + Position Information

Total political knowledge (12 items)
Bibliography


