Why Don't States Switch Sides Anymore? The Rise and Fall of American Electoral Volatility

Dean Lacy & Zachary D. Markovich

Dean Lacy, Department of Government, Dartmouth College, HB 6108, Hanover, NH 03755, Dean.Lacy@Dartmouth.edu, phone: 603-646-9228

Zachary D. Markovich, Research Associate, Harvard Business School, Bloomberg Center, 25 Harvard Way, Boston, MA, 02138, zachmarkovich@gmail.com, phone: 541-292-8023

Abstract

American electoral volatility is in a free fall. Overtime variation in the partisan balance of presidential elections across states has matched an all-time low in American history and is a fraction of its 1970's peak. The current decline in volatility parallels declines during the Gilded Age and Franklin Roosevelt's presidency. Trends in electoral volatility vary regionally, and the South's patterns of electoral volatility are distinctive. This paper develops a theory of electoral volatility at the voter level based on the premise that volatility is due to voter uncertainty. Party polarization makes the parties' positions distinct and reduces volatility. Close elections increase incentives for voters to become informed and for campaigns to inform voters, which reduce voter uncertainty. Increased voter turnout and a larger number of votes cast per state also decrease volatility. The model is empirically validated using both historical aggregate data from 1832 to 2012 and American National Election Studies (ANES) data at the voter level from 1952 to 2012.

Introduction

In Vermont, between 2000 and 2008, the twoparty voteshare won by the Democratic presidential candidate swung by fourteen percentage points, from fifty-five to sixty-nine percent, more than four times the corresponding national swing in the intervening period. Similarly, from 1988 to 1992 the Democratic twoparty voteshare spiked by an equally large twelve percent. This volatility is not new. From 1964 to 1968, Vermont's Democratic twoparty voteshare collapsed by nearly twenty percentage points, from sixty-six percent to just forty-five. In contrast, Minnesota's Democratic twoparty voteshare over the last forty years has been nearly constant, hovering near its mean of fifty-four percent.

American electoral volatility is generally considered low compared to volatility in other countries because recent national results have displayed extreme consistency. For example, one cross-national study determined that the United States has the lowest volatility in legislative elections of any country examined (Mainwaring & Zoco, 2007). Focusing on the national average volatility obscures the fact that there is tremendous variation in the volatility observed among American states. Some states exhibit great stability over a large period of time, while others have seen their results oscillate wildly – a fact exemplified by Vermont and Minnesota. Moreover, most studies of volatility include only recent elections in their analyses, missing the fact that American electoral volatility has plummeted in recent elections to levels not seen since the last three decades of the nineteenth century (Mainwaring & Zoco, 2007)

This paper represents a unique effort to examine American electoral volatility across all of the states and across most of American history. The set of presidential elections analyzed stretches back to 1828, allowing an examination of the effects of events as disparate as the Civil War and the Great Depression on American electoral volatility. The long time period of history also provides context to the current period of low volatility in American politics. Although researchers have noted the recent decline in electoral volatility (Abramowitz, 2012), the fact that this decline parallels similar trends during the Great Depression and Gilded

Age has gone unnoticed.

Aside from being an important characteristic of American political behavior, American electoral volatility also presents an ideal case study for understanding the causes of electoral volatility in general. The fifty states and the District of Columbia present significant cultural and demographic differences. Yet, at the presidential level their electoral processes are very similar. The same candidates campaign in the same states with mostly identical messages, and, with a few historical exceptions, the American states have similar mechanisms for determining the winner. The context of American elections has changed over time. The gradual expansion of the franchise over American history, changes in ballot qualification standards, the direct election of presidential Electors, and new campaign technologies make elections in 2016 different from elections in 1828. However, these changes have been relatively muted compared to the sorts of upheavals common in many countries, and have taken place against the backdrop of a near-constant constitutional order. The random effects statistical model we present controls for these sorts of unobserved confounding variables over time and across states.

This study of electoral volatility also paints a new picture of the geography of American electoral politics. Typically, the American electorate is divided into red and blue America, without paying much regard to other features of voting outcomes (Seabrook, 2009). We use cluster analysis to divide the United States into subregions based on the patterns in electoral volatility. The division between the North and South appears much more significant in volatility than in voteshare alone.

Documenting changes in American electoral volatility over time and across states is interesting and revealing in its own right. However, the more important purpose of this paper is to develop and validate a model to explain electoral volatility. We theorize that electoral volatility is due to voter uncertainty. The model echoes a previous analysis of the volatility in polling during American presidential elections, which suggested that polling is more volatile early in a campaign because voters are less informed about the candidates (Gelman & King,

1993). We find that party polarization, economic inequality, the closeness of the election, and voter turnout affect electoral volatility across time and states. Changes in economic conditions, surprisingly, have no effect on volatility.

Section 2 presents a measure of electoral volatility. Section 3 describes electoral volatility across time and states. Section 4 shows the geography of electoral volatility in ways that reflect but also move beyond the red state — blue state divide. Section 5 develops presents the theory and hypotheses. Section 6 presents the results. Section 7 concludes.

Measuring Volatility

Researchers usually study electoral volatility cross-nationally in order to identify its causes (Roberts & Wibbels, 1999; Budge, 1982). Most of these studies focus on a specific region of the world, while others examine electoral volatility in specific countries (Mair, 2008; Nooruddin & Chhibber, 2008). Scholars of American politics focus less on volatility, or over time variation, and more on shifts, or over time average votes, in the parties' electoral fortunes. Most studies focus on the national level, such as the voluminous literature on realignments, but recent studies state examine state-level trends (Holbrook, 2016). Volatility, per se, is seldom studied in depth. Brown (1991) considers several instances of very high electoral volatility in the United States (specifically, 1928-1936, 1920, and elections with a strong third party candidate). Our approach differs in two ways. First, a measure of electoral volatility is identified and used as the dependent variable. Brown treats volatility implicitly by modeling only the determinants of change in partisan turnout. Second, our analysis places as much emphasis on periods of low electoral volatility as periods of high volatility.[1]

Electoral volatility is best measured using the Pedersen index (Pedersen, 1979). This

[1]Relatedly, some authors include heteroskedastic terms in their elections forecasting models (Boscardin & Gelman, 1996; Gelman, King, & Boscardin, 1998). These models have included effects for only the number of votes cast, without building a broader causal model for explaining electoral volatility. Additionally, these models use multiple other variables to determine the expected voteshare in a state, meaning that they are measuring unpredictability more than volatility.

measure is ubiquitous in the study of electoral volatility and a systematic analysis of measures of electoral volatility concluded that it best satisfied a number of criteria (Taagepera & Grofman, 2003). The Pedersen index sums the absolute differences in parties' voteshares and divides by 2. So, for election t, electoral volatility is defined as,

$$v_t = \frac{\sum_{i=1}^{n} |p_{i,t} - p_{i,t-1}|}{2} \tag{1}$$

where $p_{i,t}$ is the fraction of votes won by party i in election t. The index effectively sums the aggregate vote share that changed between two elections and is normalized by two so that it is bounded above by one (one party went from winning all of the votes to winning none, and vice-versa for the other parties) and below by zero (the parties' vote shares remained constant). Normalization by two is necessary, because changes in voteshare are zero sum. One party's loss is another party's gain. A failure to divide by two would mean that the measure double counted the amount of electoral change. It is worth emphasizing that this measure does not take into account changes in turnout.

Because American politics is so heavily dominated by two parties, this analysis groups all third parties together so that they are treated as a single party in calculating electoral volatility. This is done to simplify the calculations, but it is also empirically justifiable, as there is evidence that third party voters are unified by a dissatisfaction with the choices presented by the two major parties, rather than a coherent set of governing principles (Lacy & Burden, 1999). This is obviously a somewhat tenuous assumption, but the voteshare won by a third party is generally very small.[2]

Back to the Future: Electoral Volatility Over Time

Figure 1 shows a box-and-whisker plot of the electoral volatility of the US states for each presidential election from 1832 to 2012. The line through the plot fits a loess regression of

[2]Prior to the emergence of the Republican party, the two major parties are the Whigs and Democrats. Prior to the emergence of the Whigs, the two majors parties are the Democrats and the anti-Jacksonians.

average volatility on election year. For comparison, Figure 2 shows the proportion of US states that changed their presidential vote from the previous election over the same time period. Both figures show that, regardless of how measured, electoral volatility displays significant historical variation. We focus on the continuous measure of volatility rather then the binary measure of whether a state swithes sides.

Electoral volatility has declined significantly in recent years. The United States is currently experiencing an extended period of remarkably low volatility, not only measured by mean volatility but also by the variance in volatility across states. In the 2012 election, the average state experienced a change of only 3.8 percentage points in partisan voteshare, the lowest on record. This protracted period of low volatility is the most similar to that seen during the Gilded Age. Some authors have called the contemporary era a New Gilded Age (L. M. Bartels, 2008). Between 1872 and 1888, the average state experienced a swing in voteshare of 8.7 percentage points. The average for elections held from 1996 on is only slightly less, 8.02 percentage points. Both time periods were characterized by intense partisanship and national elections fought to nail biting finishes. Between 1876 and 1888, no election was decided by a margin of victory greater than 3 percentage points, even narrower than the close elections in recent history, which have featured comparative blowouts, such as Barack Obama's victory by 7 percentage points in 2008. Neither time period bares much resemblance to the double digit popular vote landslides of Ronald Reagan, Franklin Roosevelt, or Andrew Jackson in Figure 1. It is no coincidence that all three of the elections that featured an electoral vote winner who lost the popular vote – 1876, 1888, and 2000 – occurred either during the Gilded Age or recently.

Additional parallels between the present and Gilded Age emerge. Wealth inequality skyrocketed in both periods, and concerns about the influence of money on politics became more salient (Gilens, 2005; Piketty, Goldhammer, & Ganser, 2014). The levels of geographic political polarization were also high in both periods. Between 2008 and 2012, only 3 states changed the party they cast their electors for. Between 1880 and 1884, only two states

changed their electoral votes.

One other period of lower electoral volatility also emerges during the Roosevelt and Truman years. Anchored by the trials of the Great Depression and World War II, the New Deal coalition delivered consistent victories for the Democrats in this period. Although the low points of this trough were quite low — 1944 saw an average change of only 4 percentage points in partisan voteshare from the previous election — it was not as pronounced or durable as the troughs in recent years and during the Gilded Age. The current trough and Gilded Age trough both reached their nadir in a run of three elections that all experienced under ten percentage points of average partisan shift (1880-1888 and 2004-2012). No similar sustained trough is present during the Great Depression and World War II.

During the antebellum period, the nation was pulled in two competing directions. On the one hand, the intense polarization around the issue of slavery prompted tremendous stability in partisan preferences. At the same time, the constant flux of the party system (the Whig Party and rose and collapsed within a span of 20 years), resulted in large amounts of volatility. Consequently, the period experienced large amounts of average volatility, while a few states, particularly in the South, displayed tremendous electoral stability.

Two main periods of high volatility are also observed in Figure 1. During the 1910's and 1920's, the Progressive movement and the rise of the Fourth Party System brought profound change to politics, introducing higher levels of electoral volatility. Women's suffrage introduced a wave of new voters into the electorate, further amplifying volatility. Another high point of electoral volatility occurred during the 1960's and 1970's, when the Civil Rights movement expanded the franchise further, followed by Vietnam and Watergate, which turned many voters away from politics. The Southern realignment also introduced dramatic changes in partisan preferences into this period. Indeed, the decline of electoral volatility in recent elections can be interpreted as the completion of the Southern realignment.

Although electoral volatility has oscillated over the course of American history, the overall trend has been downward. The highest period of electoral volatility occurred in the 1830's

and the lowest is the present. Over time the troughs of electoral volatility have become lower, while the crests have become higher. In particular, the two way contest between the Democrats and Republicans has persisted for well over a century now, allowing partisan identification to form a part of an individual's personal identity, in a way that it could not early in the country's history.

Beyond Red and Blue: The Geography of US Electoral Volatility

Presidential elections are often described as national elections. The Great Depression drove a national tide that elected Roosevelt in 1932. In 2008 the unpopular war in Iraq and collapsing economy buried the McCain candidacy. In many cases these national narratives are misleading. In each case examples remain to prove the adage that "all politics is local." In 1932, Herbert Hoover saw only a very modest reduction in his level of support in a handful of New England states despite the Great Depression. And Republican voteshare actually improved in parts of Appalachia in 2008 relative to 2004, while most of the rest of the country witnessed a decline in Republican voteshare.

These anecdotes suggest that there is an underlying geography to American elections. Although presidential campaigns are national events, each state responds to those events in different ways. This section will use social network analysis to uncover the geography and political regionalism of the United States. The electoral history of the United States allows the states to be partitioned into different clusters based on their similar or different electoral histories. Volatility can be an important tool in analyzing the geography of American elections.

The growing polarization of American elections — just 2 states changed their votes from 2008 to 2012 — has led many observers to identify regional groupings of the country (Abramowitz, 2012). The unique racial divisions and electoral history of the South have caused it to be identified as a distinct political region, while the Northeast and Pacific West are identified as the left leaning "blue wall" that has voted for the Democratic nominee for

six straight elections (B. A. Campbell, 1977; Trende, n.d.). Although qualitative assessments focus on geography in identifying clusters in American elections, quantitative analyses have instead delved deeper and identified clusters based on the demographic characteristics of the states (Seabrook, 2009). For instance, Liberal clusters tend to be centered around diverse, urban areas while conservative clusters are rural and overwhelmingly white. Changes in the level of clustering over time have also attracted attention from political scientists. Polarization in American politics has increased over time, and some studies propose geographic sorting as an explanation for why electoral polarization has increased (Levendusky, 2009; McDonald, 2011).

Electoral Volatility in the States

Electoral volatility varies by geographic region. In Figure 3, the shading of states corresponds to the average electoral volatility of the state. The bottom map shows the average across all elections from 1824 to the present. The top map shows elections from 1980 on. The average level of volatility in the bottom plot from 1824 onward is much greater than the top plot from 1980 onward, though the greater number of elections in the bottom plot should reduce average volatility rather than increase it. The period since 1980 has been characterized by extremely low levels of volatility. Historically, the South has displayed dramatically greater levels of electoral volatility than rest of the country. This may be due to the electoral tumult brought on by the Civil War, Reconstruction, and the Civil Rights movement. Since the 1980's, the South has emerged as one of the nation's most stable electoral regions suggesting that the cause of this increased volatility has been eliminated.

The Great Plains states also demonstrate higher levels of electoral volatility in both plots. Although this makes sense historically, because the early influx of pioneers would have introduced new voters into the electorate and therefore driven electoral volatility higher, it is more difficult to explain today. High volatility historically may also be due to the success of the Populist movement in the Great Plains in the late 1800's, which rapidly shifted the

region from Republican to third party to Democratic, although this also does not explain the distinctiveness since 1980. Swing states seem to display lower volatility than similar, neighboring states. In the post–1980 map, Ohio is less volatile than Indiana, Florida less volatile than Georgia, and New Hampshire less volatile than Vermont.

Networks of States

A social network is defined by an adjacency matrix, which in this case is the correlation matrix of some element of states' voting histories, specifically, volatility and voteshare won by each party. Correlation was used as the measure of similarity of shape because it is resistant to translations and rescalings of the data (unlike say, the covariance or cosine similarity). A k-means partition works by selecting k cluster centers along the dimensions defined by the similarity matrix. In the example of presidential elections, the similarity matrix has 51 dimensions, one for each state, plus Washington, D.C. The centers are chosen through an iterative process that minimizes the squared distance between each point and its nearest cluster center. The points are then partitioned by assigning each to its nearest cluster center.[3] Most of this analysis uses two clusters to simplify the results and to reflect the common division of America into two dimensions of party and ideological competition. NOMINATE scores usually uncover one dominant and one secondary dimension of voting in the US Congress (Poole & Rosenthal, 2001). The dominant dimension is a left-right scale of economic issues, which generally corresponds to the dimension of two-party competition. The second dimension historically represents a divide between slave states and free states and more recently to a division on issues of race. In one of the partitions considered, a two cluster partition results in the generation of a trivial cluster of only one state, so a three cluster partition is used instead.

The volatility partition (bottom left of figure 4) splits the nation neatly into two, with

[3]This method is preferable to other partition methods because it selects the clusters that are most similar to each other as opposed to alternate methods that can end up selecting clusters containing points that are very dissimilar.

the South in one cluster and the rest of the nation in another. The Southern cluster is persistent (although smaller and with New Hampshire added) even in the partition that uses only elections from 1980 on. This suggests that there are patterns in the electoral volatility of these states that separate them from the rest of the country, even though the elections included post-date the bulk of the Southern realignment. The border states of Missouri, Kentucky, Maryland, and Delaware appear in the Southern cluster in the volatility partition using all elections, even though they never seceded, suggesting that the crux of the difference might be slavery and race relations rather than secession. Interestingly, Hawaii also appears with the South in the partition using all elections. However, it is likely that Hawaii didn't fit cleanly with either partition given its comparatively short voting record and placement in its own cluster entirely in the partition only using elections from 1980 on.

The partition generated by using the same method on a matrix of states' historical twoparty Democratic voteshare generates much less consistent results. Although the South emerges as a distinct region when using all elections available, its cluster also includes a large chunk of the Great Plains states. This grouping breaks down entirely after 1980 when the division ceases to correspond to any obvious regional groupings.

Both volatility and voteshare group Virginia with the Northern cluster, suggesting that its more recent trend towards the liberal states has deep roots. Florida also switches clusters in both cases. This might be a reflection of immigration from the Northeast and Cuba drastically changing the culture and political identity of the state. Texas, Oklahoma, Delaware, Maryland, and Missouri also move from the Southern to the Northern clusters when comparing the volatility partitions, suggesting that those states have also undergone a change to their political identities. Vermont and West Virginia are the only two states to move from the North to the South when moving between the two volatility partitions.

A two dimensional projection of the correlations in patterns of volatility between states (Figure 5) further illustrates the partitions.[4] The horizontal axis roughly corresponds to

[4]Projection was done via PCA using R's prcomp function. The projection captures approximately 61 percent of the variance in the correlation matrix. This projection used all elections from 1824 to the present.

a liberal/conservative scale while the vertical axis corresponds to a former free state/slave state axis. Overall, the clusters provide a natural and intuitive division of the country. This visualization highlights the borderline status of Hawaii.

This visualization also indicates that if more clusters were added, a Western cluster would emerge (centered in the bottom left quadrant). This may reflect the distinct history and culture of these states, which generally entered the nation after the end of the Civil War and therefore do not have the battles over slavery reflected in their electoral histories. The difference between these states and the center of the Northern cluster is smaller than that between the most extreme Southern states (South Carolina, Alabama, Mississippi, and Louisiana) from the center of their cluster, so practical significance of this distinction is dubious.

The difference in the patterns of volatility seen in the two clusters is visualized in Figure 6. Slavery was a more critical issue to the South during the beginning of the data set, so its electoral volatility starts higher. As the country recovered and Reconstruction ended, volatility in both the North and South declined dramatically. The early 1900's saw a rebound that was more pronounced in the North than in the South. This was likely caused by the candidacy of Woodrow Wilson in 1912 and 1916. Wilson, a Democrat from New Jersey at the time but raised in Virginia, held onto the South's Democratic vote, while his Progressivism won Northern states in 1912 and 1916. By 1920 the Republicans recaptured the North, Great Plains, and West, and Democrats continued to dominate the South. After the Progressive Era peak, volatility declined until the Civil Rights movement and subsequent Southern realignment introduced substantial volatility into both regions. Notably, the South was more affected by these changes than the North. Since the 1970s, electoral volatility has declined in both regions, and total levels of electoral volatility have converged between the regions. The recent decline in volatility has been steeper in the South, suggesting that the decline may have been accelerated by the completion of the Southern realignment.

Explaining Volatility

To explain electoral volatility, we start at the level of the individual voter. We posit that each voter is characterized by a predisposition to vote for one the competing candidates as well as a random error. The random error in a voter's decision-making is increased by uncertainty about which candidate to select, or whether to vote at all. The policy differences between the candidates and the voters' access to or incentive to acquire information about the candidates reduce uncertainty. When the difference between parties' policy positions is large, voters are better able to distinguish between the two candidates, and their voting behavior becomes more stable. The particular pattern of volatility in the South may result from the parties switching positions on salient regional issues during the 1960s through 1980s (Sniderman & Stiglitz, 2012).

Voter engagement also reduces electoral volatility. When an election is close and voters believe their votes matter, they take greater care with their decision and gather more information about the candidates. The campaigns also put more resources into informing voters in swing states where the election is likely to close.

The unifying factor between these two explanations is voter uncertainty. When voters can easily distinguish the two parties from each other and have an incentive to put the needed effort into doing so, electoral volatility declines.

Previous research supports these causal mechanisms by which growing ideological polarization and heightened voter engagement reduce electoral volatility. First, these two factors strengthen voters' confidence in their ideological preferences, which are more stable over time, and mean that voters are less influenced by things that are unstable between elections and maybe not even clearly under the president's control, such as economic growth and international crises (J. E. Campbell, 1983). Polarization also reduces the number of persuadable "floating" voters, therefore reducing electoral volatility (B. L. Bartels, Box-Steffensmeier, Smidt, & Smith, 2011). Finally, polarization may raise the stakes for partisans by increasing the policy consequences when a competing party is elected(Hetherington, 2001).

A Model of Electoral Volatility

We theorize that electoral volatility is rooted in voter uncertainty. When voters are able to easily distinguish the candidates, electoral volatility declines. We advance this argument by developing a formal model that makes this point. We then test the predictions empirically.

Suppose that voter i chooses between parties A and B. A classic Downsian model tell us that if $E_i(A)$ and $E_i(B)$ denote the voter's expected utility from the election of parties A and B, then the voter will vote for party A if,

$$E_i(A) - E_i(B) > 0 \tag{2}$$

As a simplifying assumption, this model assumes that a voter chooses only between two parties (abstention or third parties are not an option). The results apply intuitively to a model where more choices are available.

One shortcoming of this model is that it assumes that voters have perfect information about the utility they will derive from a candidate's election. In reality though, voters can seldom perfectly estimate these utility functions. Political information is fraught with error and ambiguity. Common sources of political information, such as the news, blogs, friends, and family are frequently tinged by partisan bias, and a voter's exposure to these potentially misleading sources is often haphazard. While in earlier decades most voters received their political information from a homogenous set of neighbors and friends and one local newspaper with a partisan bias, the modern information environment provides multiple, easily-accessible sources of information. Last-minute attack ads and changes in economic conditions or current events also introduce stochastic shocks to voters when the parties have similar positions. Sources of (mis)information and changes in the issue environment are essentially random and can be modelled by adding a stochastic error term, ϵ_i, to the model. So now, voter i will vote for party A if,

$$E_i(A) - E_i(B) + \epsilon_i > 0 \tag{3}$$

So, the probability, p_i, that voter i votes for party A is,

$$p_i = P(E_i(A) - E_i(B) > \epsilon_i) \tag{4}$$

And the variance of voter i's decision will be

$$p_i(1 - p_i) \tag{5}$$

Moreover, voter i can reduce the magnitude of ϵ_i by devoting more effort, k_i to acquiring accurate political information. So,

$$\epsilon_i^2 = f_i(k_i) \tag{6}$$

f_i is a function that determines how much voter i's uncertainty is reduced from investing time into learning about the campaign.

This model can be easily extended to draw conclusions about the causes of volatility in aggregate voteshare. Since the aggregate voteshare is the sum of a series of Bernoulli random variables with differing means, the aggregate voteshare will be Poisson Binomial distributed. Then, if the electorate has n voters, the fraction of the twoparty voteshare won by party A, μ is,

$$\mu = \frac{\sum_{i=1}^{n} p_i}{n} \tag{7}$$

and its variance, σ^2 is,

$$\sigma^2 = \frac{\sum_{i=1}^{n} p_i(1 - p_i)}{n} \tag{8}$$

There are then three ways that electoral volatility can fall. The first is an increase in party polarization:

Increasing the magnitude of the difference in expected utility between the parties, $(E_i(A) - E_i(B))^2$, reduces electoral volatility.

If $E_i(A)$ and $E_i(B)$ are very close, voters are likely to change their votes. A last minute

attack ad or a conversation with a friend could easily sway a voter. The occurrence of these sorts of encounters are nearly random, and, if they have the potential to change a person's vote, they will introduce a significant amount of volatility into the election. In contrast, when the parties are heavily polarized, few voters will be willing to change their votes, and the election results will be preordained months in advance. This finding contradicts the theoretical relationship between electoral volatility and polarization advanced by Roberts and Wibbels, but corroborates their empirical findings. Dalton (2007) agrees with this finding, arguing that as the fraction of weak partisans and late deciders increases, so does electoral volatility. Smidt (2015) shows using panel data in recent US elections that polarization reduces the number of floating voters in the electorate, which should reduce volatility. Also consistent with Smidt (2015), voters do not need to know the parties' positions explicitly since they can take cues from political elites and discussion networks. Voters do not have to be informed in our model. Uninformed voters may have a large stochastic component to their votes compared to informed voters. Regardless of the magnitude of this noise or error in vote choice, polarized parties reduce voter uncertainty, and, therefore, electoral volatility.

Political polarization may be ideological and captured in a spatial model of voting. Polarization may also be economic in origin, a product of a widening income gap and the concentration of wealth. Even if the parties are close together on a catch-all ideological dimension of liberal-conservative, they may be far apart in their representation of economic interests. McCarty, Poole, and Rosenthal (2016) find a reciprocal relationship between party polarization and economic inequality. Economic inequality is another form of polarization when one party represents upper income groups and the other party represents lower income groups. Therefore, a corollary mechanism affecting electoral volatility is:

Increasing economic inequality reduces electoral volatility.

The second mechanism by which electoral volatility will decline is a reduction in voter uncertainty about the candidates' positions.

Reducing ϵ_i by increasing effort put into gathering political information, k_i, reduces electoral volatility.

When voter engagement is high, voters will devote more time to analyzing and understanding the election. As they do so, their beliefs will become more certain and their openness to persuasion will decline. States in which the cost of acquiring information is low or the populations are well informed or interested in politics will display lower levels of electoral volatility than than states with high information costs or disinterested citizens.

The third mechanism for the decline in electoral volatility is purely mathematical and results from larger numbers of voters, which, in the aggregate, decreases the magnitude of average errors in voting.

Increasing the size of the electorate, n, reduces electoral volatility

This is a key tenet of the Central Limit Theorem: the greater the number of observations of a random variable, the lower the variance around mean. Each voter in our model can be thought of as a realization of a random variable. Although there are a large number of voters in every election, so that the incremental reduction in volatility from the addition of a single voter is quite low, the range of votes cast across states is large enough that the number of vote cast can be a significant factor in explaining electoral volatility. For example, in Nevada in 1900 only 10,196 votes were cast, while in California in 2008 13,561,900 were cast.

The model controls for economic conditions, which exert a strong influence on aggregate election outcomes (Kramer, 1983, e.g.). The model includes the percent change in per capita gross domestic product in each election year. A declining economy typically reduces the incumbent party's vote share. An improving economy may have an asymmetric effect of either increasing the incumbent party's vote share, which would also imply an increase in volatility, or of maintaining the incumbent party's vote without necessarily increasing volatility. The model includes the change in per capita GDP in the year before the election

as well as the absolute value of the change in per capita GDP, both of which should be negatively related to volatility.

Testing the Model After 1952

Since 1952, the American National Election Studies (ANES) has included a question asking voters whether they care who wins the presidential election. This question effectively measures voters' ability to distinguish their utility derived from the two candidates. Voters who answer that they "do not care" who wins the election are indicating that they are uncertain about which candidate best maximizes their utility function (E_i in the previous model). Presumably, the answer to this question could be changed by increasing the ideological gap between the two candidates, $(E_i(A) - E_i(B))^2$, or the amount of political information the voter consumed (k_i), and so measures the joint effect of both factors. The effect of these two variables on aggregate electoral volatility can then be tested by comparing national electoral volatility with the fraction of people in the ANES who answered that they cared who won the presidential election, where each election year is an observation (N=15).

A multiple regression model indicates that each percentage point increase in the percent of respondents who indicated that they care who wins the election decreases the expected electoral volatility by 0.26 percentage points (s.e.=0.11). The percentage of total votes awarded to a third party candidate is also included as a control in this model. Credible third party candidates introduce substantial volatility into the model by expanding the number of choices that voters have. Consequently, electoral volatility will be much higher than otherwise expected in these elections. The regression explains 61% of the variance in electoral volatility. The number of votes cast is not included in this model because there are so many votes cast nationally in each election after 1952 that the impact of an increase in the number of voters on expected volatility is small.

Figure 7 visualizes this relationship. The figure matches the expected relationship. The low levels of electoral volatility seen in recent elections are associated with high fractions of

voters indicating that they care about who wins the election. The 1964 and 1992 elections emerge as obvious outliers to this downward trend due to the successful third party candidacies of George Wallace and Ross Perot. Interestingly, 1980 did not feature a high degree of electoral volatility in spite of the reversal of a Democrat's victory from the previous election and the third party candidacy of John Anderson.

Testing the Model Before 1952

First, the squared difference between party means in the house DW-Nominate scores are used to measure the utility gap between the two candidates (Poole & Rosenthal, 2000; Carroll et al., 2008).[5] This is obviously an imperfect proxy since the ideology of House members will not perfectly correspond to the ideology of the candidates nominated, and the aggregated ideological difference between the two parties may not capture the true difference in voter utility because voters might weight certain issues more heavily than aggregation. Nevertheless, in aggregate, *polarization* is a useful proxy for the difference in voters' expected utilities between the two parties. Party polarization should be associated with a larger gap in voters' expected utilities, and polarization positively correlates with the percentage of voters who say that they care about the outcome of the election for elections since 1952 in which both variables are available ($r = .88$).

Economic inequality is available from 1916 onward, after the creation of the federal income tax provided a source of data on income. Economic inequality is measured as the percentage of total income held by the top one tenth of one percent of households (Piketty et al., 2014). This varies nationally across years but does not vary by state. Economic inequality is a measure of national interests rather than local interests represented by the parties.

Two variables measure the effect of voter information. First, voter information will increase with the *closeness* of an election for two reasons. First, voter enthusiasm is likely to be higher in close elections, and voters are more likely to seek out information about the

[5] Only the first dimension is used.

candidates. Second, campaigns will target states that are more competitive, providing voters with additional sources of information about the candidates. Closeness is operationalized as the negative square root of the distance from fifty–fifty two party voteshare in each state in each year. A square root transformation is used to capture diminishing returns from closeness. The increase in voter engagement gained by moving from 50% to 55% Democratic twoparty voteshare is likely much greater than that gained by moving from 75% to 80%.

Additionally, the effort that voters put into acquiring new information should rise with *turnout*. Turnout as measured as the number of ballots cast divided by the population of the state according to the census. Turnout is an indirect measure of voter enthusiasm, which is in turn a measure of the effort that a voter puts into learning about the candidates. The same forces that motivate voters to turnout should also motivate them to follow the campaigns more closely and to devote more time to learning about the candidates. Turnout is defined as the number of votes divided by the total population of the state.

Finally, the total *number of votes cast* in a state in an election corresponds to n in the model. Whereas the number of votes cast was dropped from the aggregate, post-1952 model, we include it here since there is significant variation in the number of votes cast across states and also across years.

The relationship between electoral volatility and the previous variables can be tested using cross sectional time series data where every observation corresponds to a unique state and election. A panel model with state and year random effects is then used to asses the relationship between the variables. [6] A model that includes only the elections from 1960 on is included to help asses how the effect of these variables on electoral volatility has changed over time. The model is also estimate on elections from 1916 onward due to the availability of a measure of economic inequality.

The results appear in Table 2 and are presented graphically in Figure 8. The dots in Figure 8 show the expected effect on volatility of a one standard deviation increase in each

[6] We do not measure polarization of state congressional delegations since this is a study of presidential elections, where the candidates are the same across states in each election.

independent variable. The horizontal lines are 95% confidence intervals. Focusing first on the results of all elections from 1832 onward, we find that all of the variables have effects in the expected direction, but only the closeness of the election is statistically significant as a predictor of volatility since it is the only variable with a confidence interval that does not cross the vertical zero line. The effect of closeness is also significant across all time periods. Easing the threshold for statistical significance to an 80% confidence interval, polarization and number of votes cast also explain volatility. Turnout does not. The failure of the number of votes cast to emerge as a statistically significant variable at the 95% threshold may emerge from the correlation of errors among voters. If this were the case, electoral volatility would not decline as consistently with the number of votes cast.

The results for elections from 1916 onward again show that all effects are in the expected direction. All variables but number of votes cast are also statistically significant with a 95% confidence interval, and number of votes cast is significant with an 80% confidence interval. Polarization, turnout, and closeness all have substantively significant effects on volatility. A one standard deviation increase in polarization, a difference of about .25 points on the DW-Nominate scale, drops volatility by two points. Economic inequality is also a significant predictor of volatility.

The results are strengthened for polarization, closeness, and turnout when examining elections since 1960. The results for polarization and closeness confirm the theory that volatility is due to voters' uncertainty. One explanation for the stronger results from 1960 onward is that the efficiency of effort invested into gathering political information has become greater over time. It has become dramatically easier to transmit political information and for voters to discern differences between the parties. The rise of railroads and later jet travel made it progressively easier for the candidates and campaign staff to travel to meet voters. The invention of radio, television, and the Internet reduced the cost of information about politics and made it easier for voters to become informed about the candidates and the issues. Notably, both ease and travel and efficiency of communication took large steps

forward during the 1960 election, the first to feature prominent television coverage of the campaigns, the first televised debates, and jet travel by both candidates.

Changes in per capita GDP generally have no effect on volatility. The absolute value of GDP change has no effect on volatility in any time frame. The raw percent change in GDP has a negative effect from 1916 onward but not from 1960 onward. Greater GDP growth reduces electoral volatility while declines in GDP growth increase volatility.

In general, the results confirm that factors affecting voters' expected utilities of voting for each candidate also affect volatility. Closer elections, higher turnout, and parties with distinct positions all reduce electoral volatility. The size of electorates and their turnout rates are generally increasing over time, therefore we should continue to expect downward pressure on electoral volatility. Party polarization and inequality may vary over time. Polarization and inequality will increase volatility as the parties adopt less distinguishable positions and as economic inequality declines. Volatility will decrease when, as in the current era, the parties have distinct positions and economic inequality is high. Close elections also reduce volatility. Taken together, we expect that only significant shocks to the political or economic system will likely spur increased volatility and more states switching sides in elections.

Conclusion

Electoral volatility arises from three general factors: volatility in the factors that determine electoral outcomes, volatility induced by institutional factors, and volatility that is an inherent part of voter behavior. The first two sources of volatility have been studied extensively in cross-national contexts that provide variation on electoral institutions. This paper takes a different approach by identifying volatility as a behavioral question and leveraging the variation in US states over time to examine it. Building off a model of voter choice with a stochastic error term in voter decisions, we identify four behavioral factors that determine electoral volatility. We then verify the model using empirical data on American elections from 1832 to 2012.

The United States is a useful case study for determining the causes of electoral volatility for two reasons. First, The US's exceptionally stable twoparty system means that electoral volatility is easily calculated and directly comparable over an incredibly large period of time. Second, the US states create a natural experiment for comparing behavioral sources of volatility because both the institutions, electoral systems, and presidential candidates that determine each party's electoral success are constant between the states.

Electoral volatility is fundamentally a product of voter uncertainty. When voters are confident in the difference between the two candidates, their decision is clear. In contrast, if substantial voter uncertainty prevails, chance plays more of a role in voting and voters can have their votes unsettled by last minute campaigning and short-term changes in economic conditions or current events. Moreover, the candidates ideologies are frequently stable between elections, suggesting that well informed voters will change their partisan choices infrequently. This hypothesis is assessed using ANES data as well as several other variables that are expected to correlate with voter uncertainty.

In the process of assessing this hypothesis, we find that American electoral volatility is on a dramatic, decades long decline. Electoral volatility is at its lowest historical level and is now under a fifth of its peak value. This decline represents a significant and relatively invisible trend in American electoral politics. Potential causes for this decline include increasing polarization, increasing voter enthusiasm, improved access to political information, and increasing income inequality. The previous nadir of electoral volatility occurred during the Gilded Age, a time period that was also characterized by intense partisan polarization, record income inequality, and close, hard fought elections.

Electoral volatility also identifies an increasing regionalization in American politics. In particular, the division between the North and South, which has been such a prominent feature of American elections for so long, is more robust when measured using volatility rather than raw voteshare. This surprising result shows that while electoral volatility is partly a national phenomenon, it is also a state-level phenomenon affected by differing political

histories and cultures across states.

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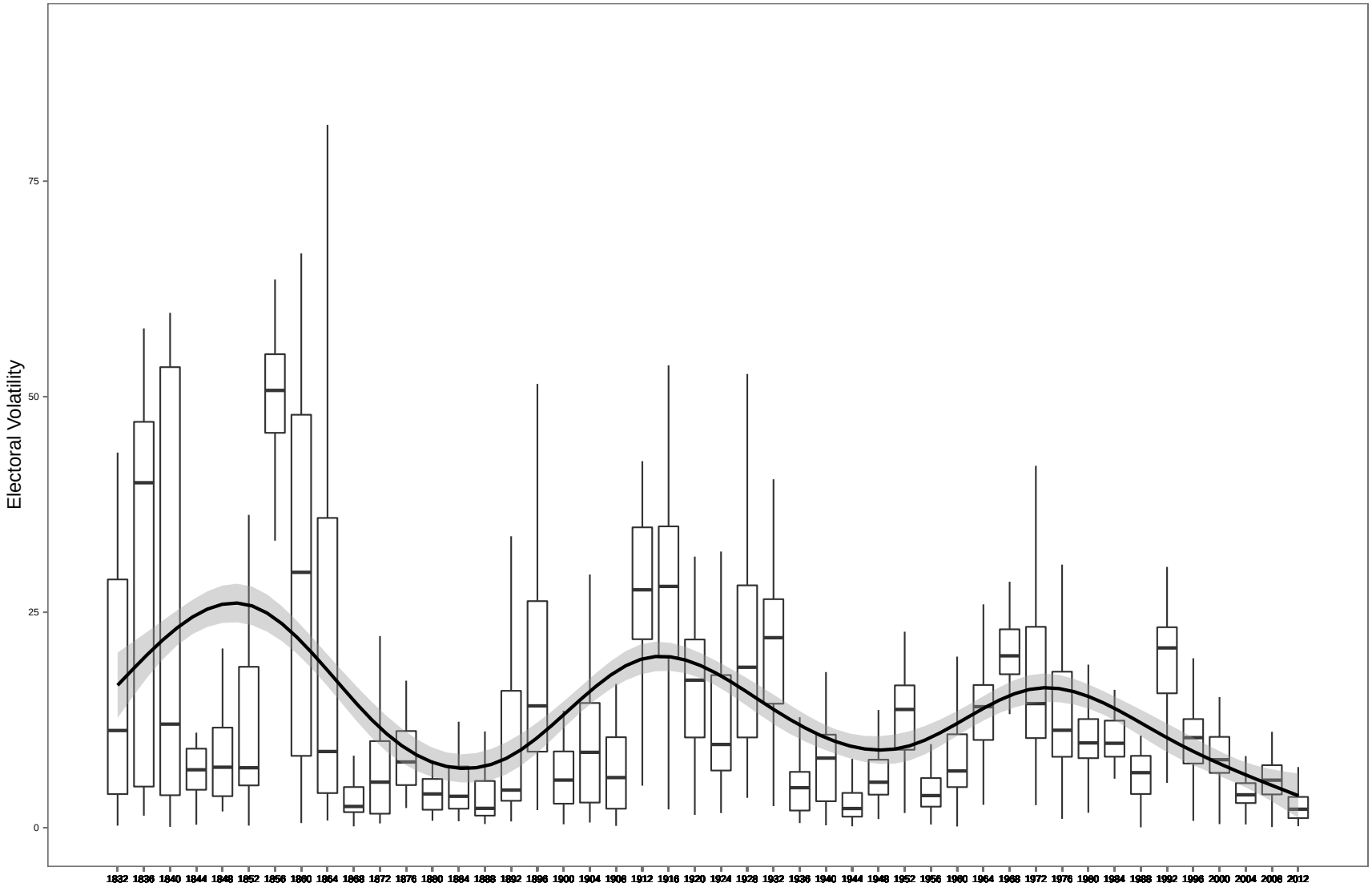

Figure 1: State Electoral Volatility in US Presidential Elections,1832-2012

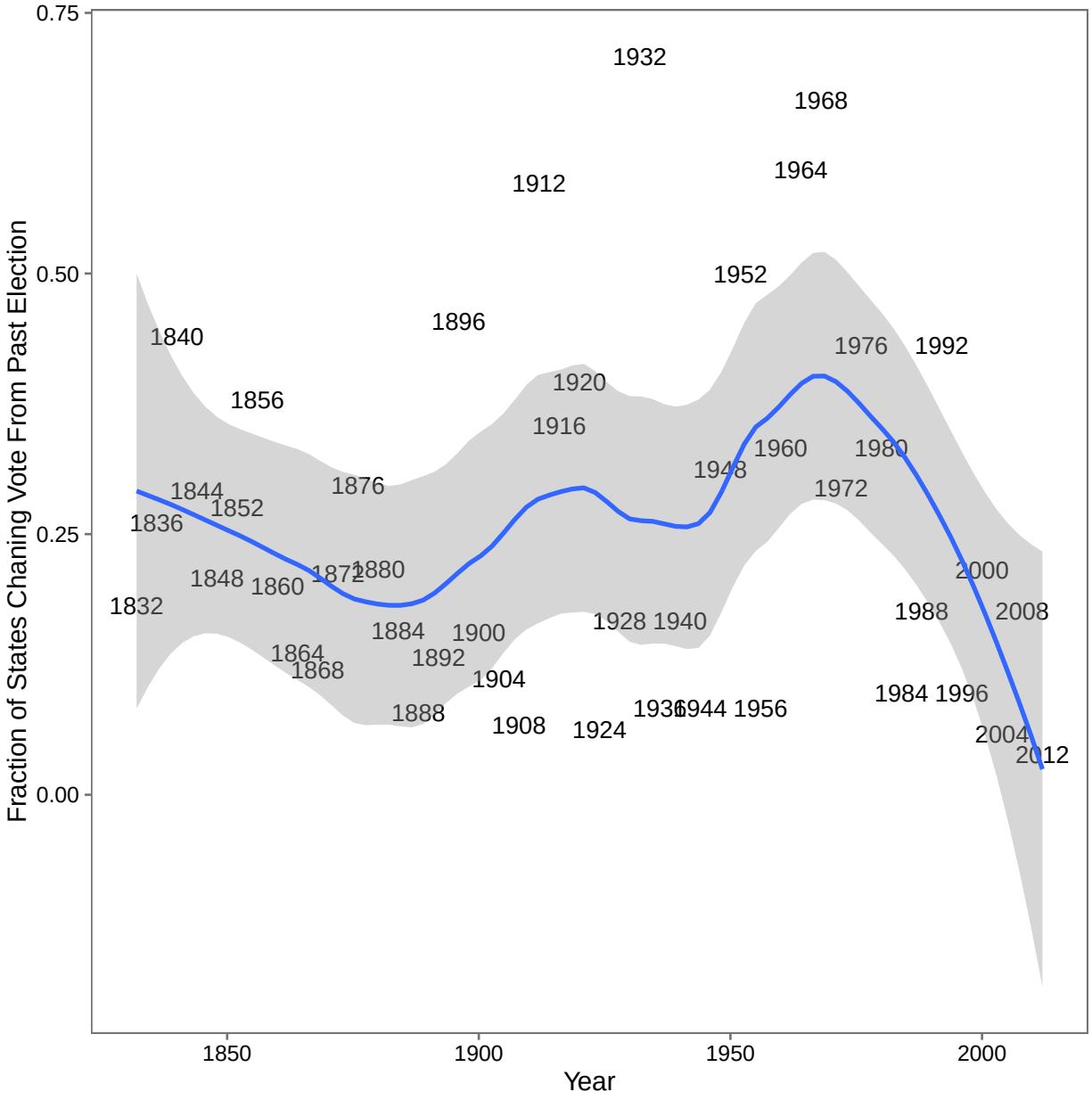

Figure 2: Proportion of US States That Changed Presidential Vote from Previous Election, 1832-2012

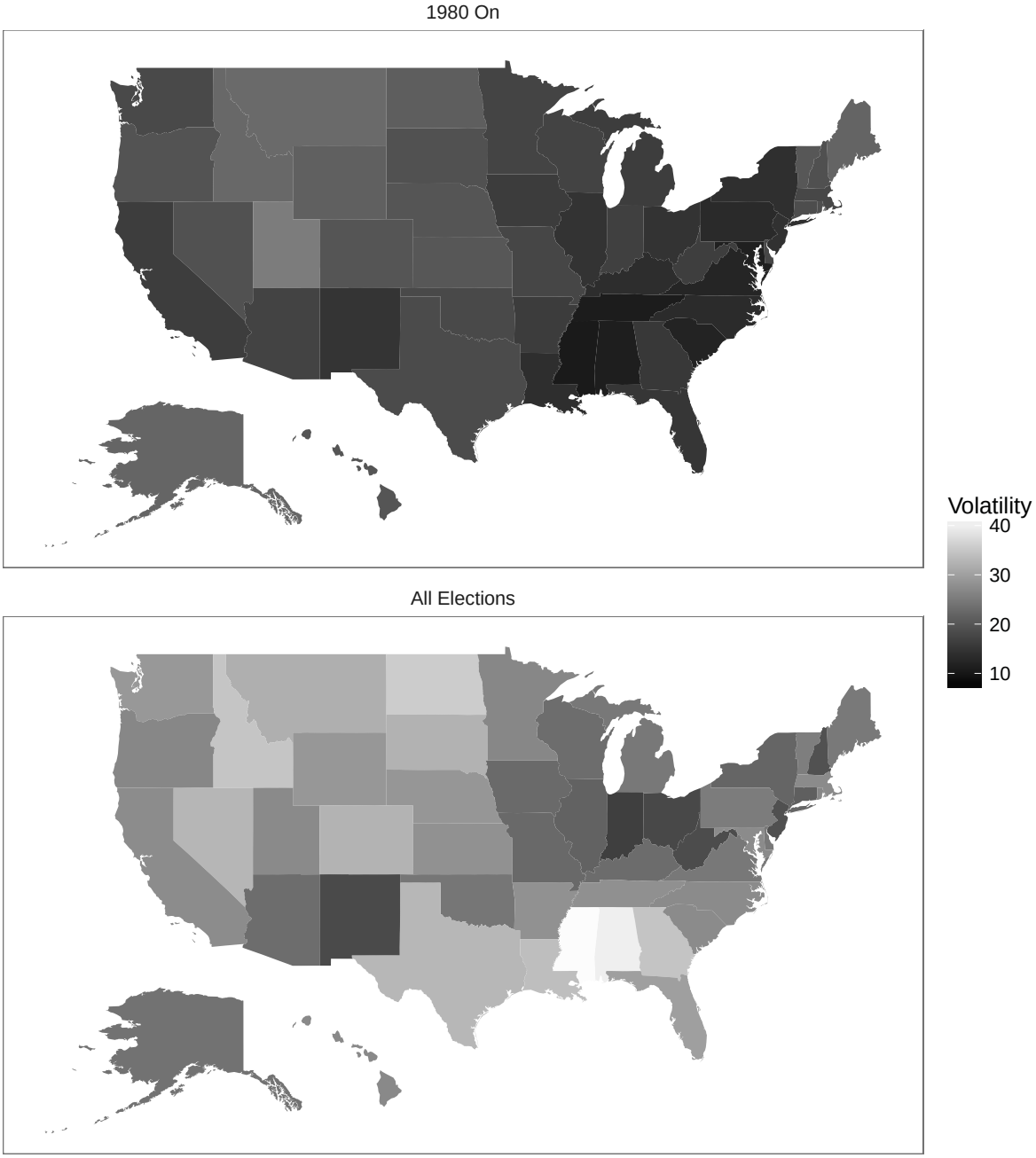

Figure 3: Average Electoral Volatility

Figure 4: Partitions

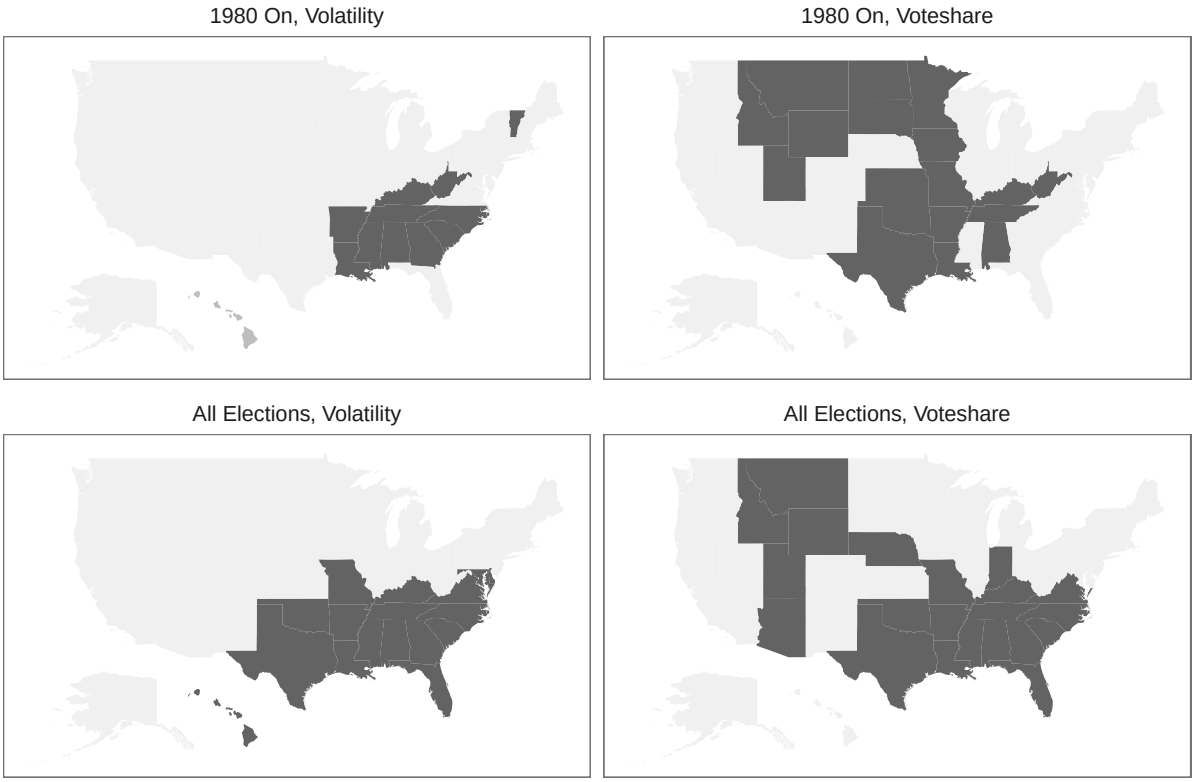

Figure 5: Two Dimensional Projection of Clustering in Volatility

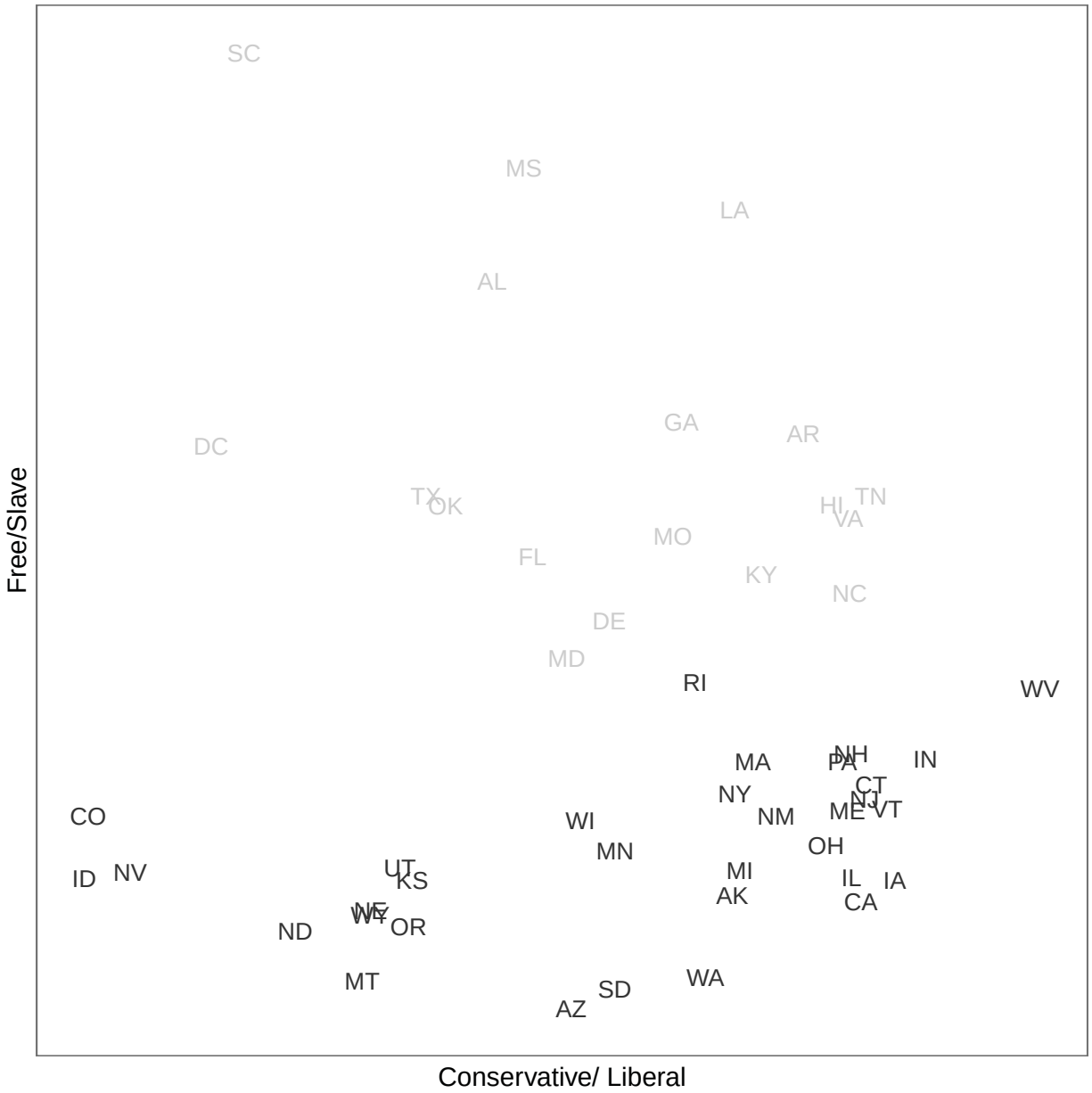

Figure 6: Cluster Volatility Levels Over Time

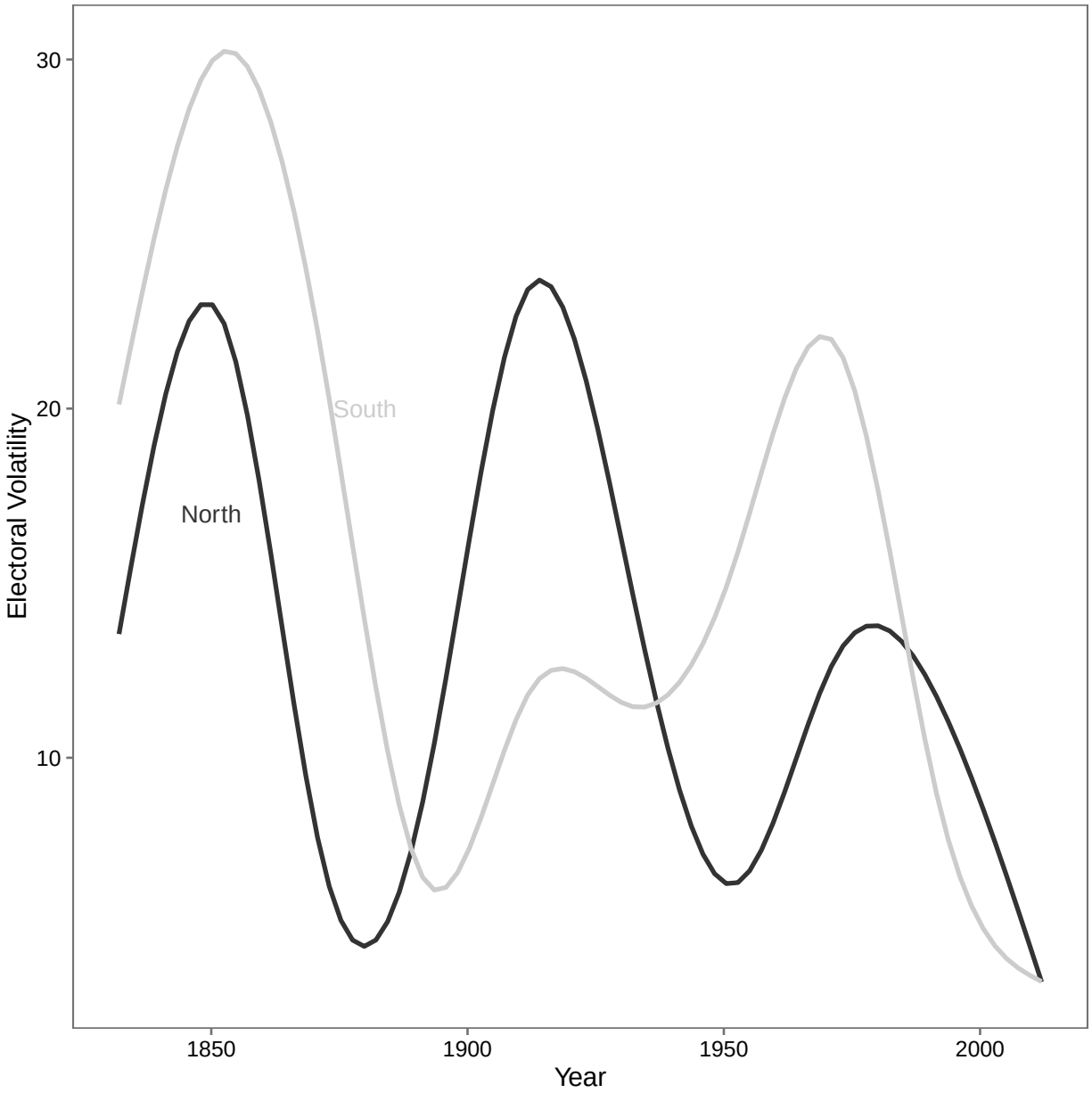

Figure 7: Electoral Volatility versus Percent Indicating That They Care About Outcome of Election

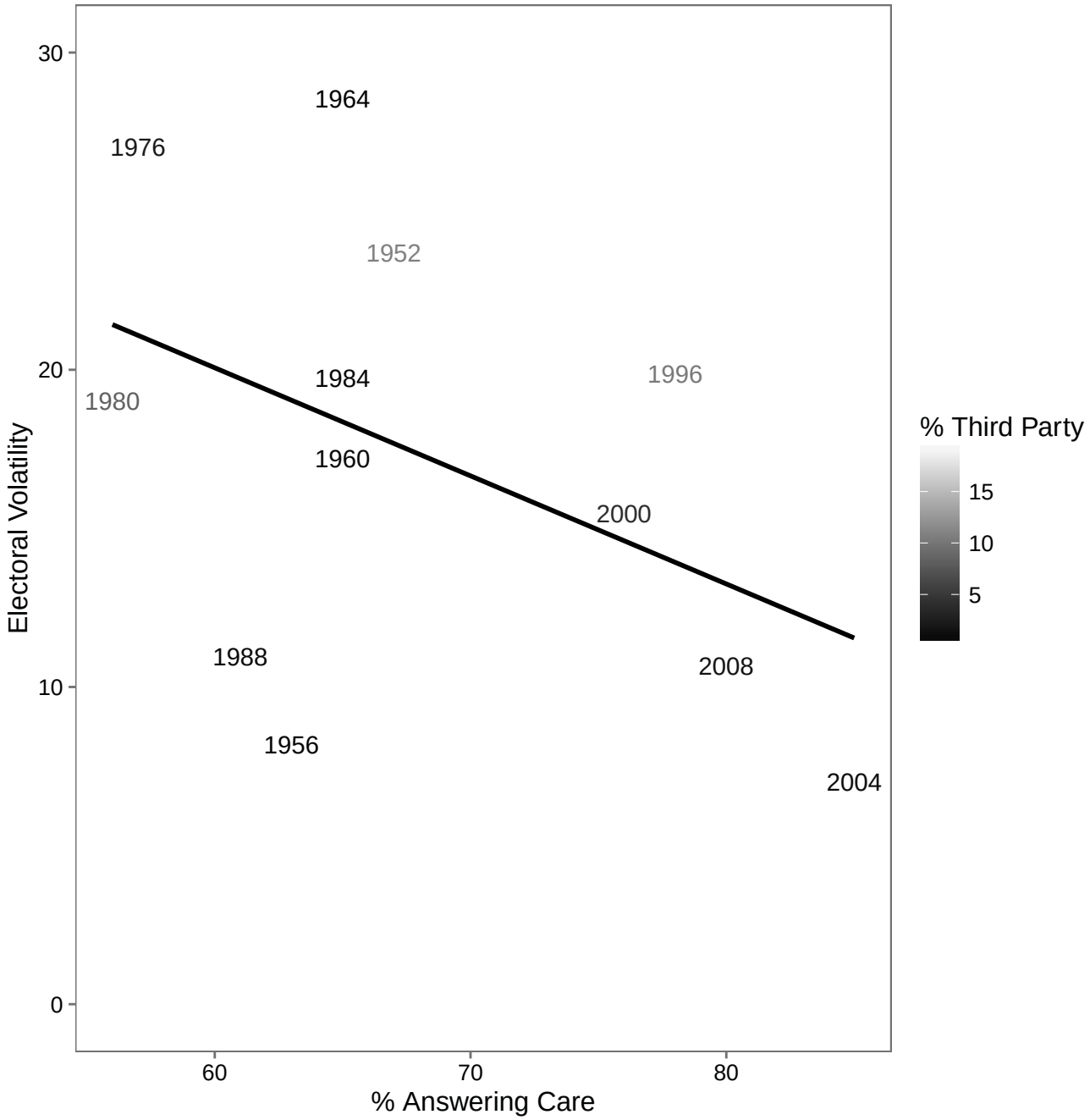

Figure 8: Determinants of Electoral Volatility, Random Effects Model, Controlling for Income Inequality

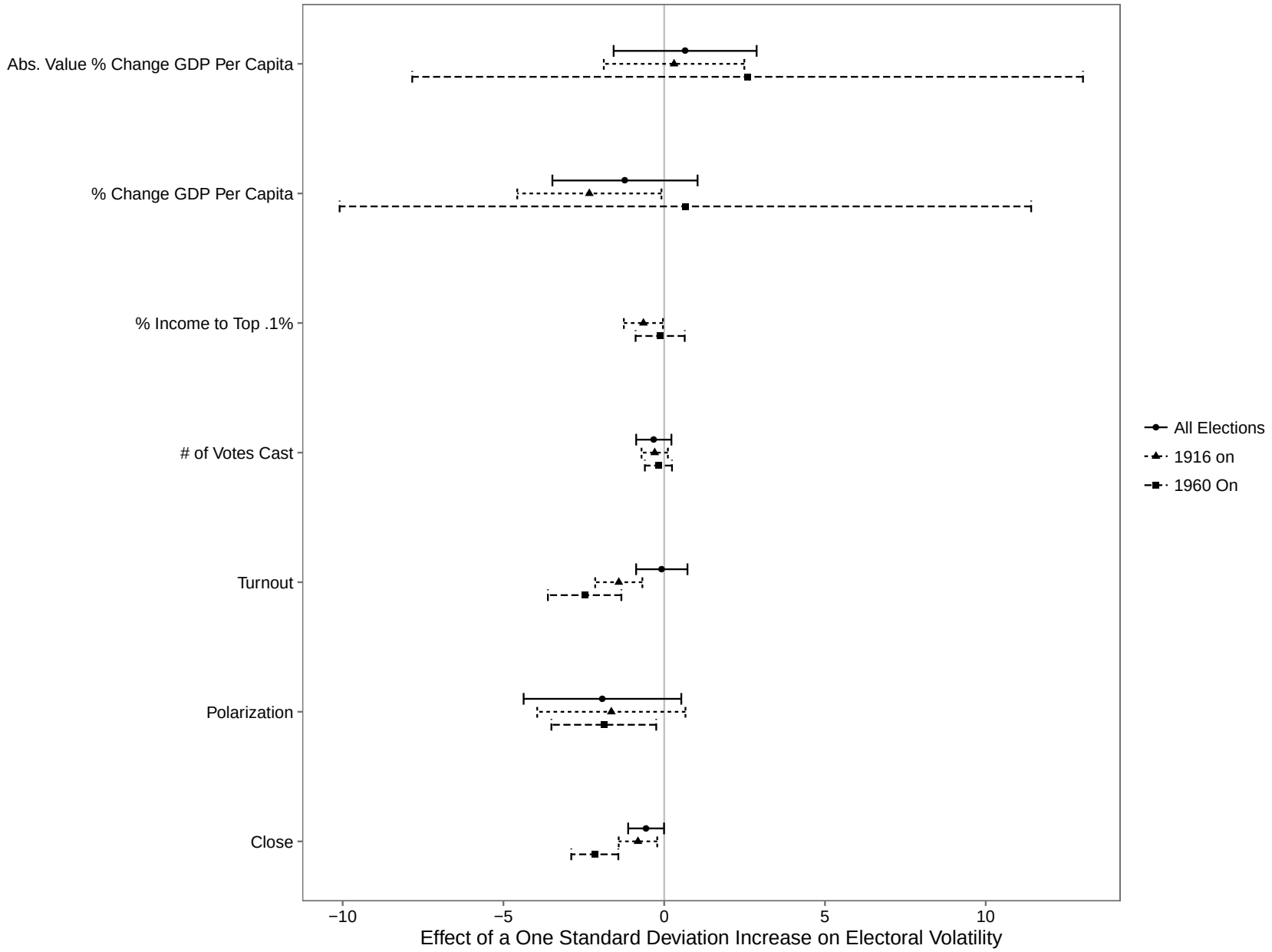

Table 1: Explaining National Electoral Volatility, 1952-2012

	Dependent variable
	Volatility in Presidential Popular Vote
% of Voters Who Say They Care About the Outcome	-0.259^{**}
	(0.108)
% Votes for Third Party Candidates	0.664^{***}
	(0.174)
Intercept	24.060^{***}
	(7.422)
Observations	15
R^2	0.609
Adjusted R^2	0.544
Residual Std. Error	3.772 (df = 12)
F Statistic	9.363^{***} (df = 2; 12)
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 2: Explaining State Electoral Volatility, Random Effects Model Results

	Dependent variable:				
	Electoral Volatility				
	All Elections	1916 on	1916 on	1960 on	1960 on
	(1)	(2)	(3)	(4)	(5)
Close	−0.361**	0.028	−0.524***	−1.095***	−1.387***
	(0.183)	(0.190)	(0.197)	(0.226)	(0.240)
Polarization	−7.622	−7.028	−6.528	−12.084***	−7.455**
	(4.966)	(4.348)	(4.669)	(2.648)	(3.302)
Turnout	−0.005	−0.070***	−0.096***	−0.095**	−0.168***
	(0.028)	(0.026)	(0.025)	(0.037)	(0.040)
Votes (Ten Thousands)	−2.121	−2.862**	−1.938	−0.331	−1.175
	(1.834)	(1.393)	(1.372)	(1.560)	(1.410)
Frac Income .1%			−0.211**		−0.041
			(0.101)		(0.127)
% Third Party	0.593***	0.743***	0.723***	0.599***	0.576***
	(0.028)	(0.033)	(0.032)	(0.042)	(0.043)
% Change GDP Per Capita	−0.255		−0.488**		0.138
	(0.241)		(0.240)		(1.149)
Abs. Val. % Change GDP Per Capita	0.195		0.092		0.776
	(0.339)		(0.333)		(1.591)
Constant	12.684***	14.941***	15.542***	15.417***	13.699***
	(3.137)	(2.709)	(3.138)	(2.556)	(3.571)
Observations	1,873	1,216	1,127	689	648
Log Likelihood	−6,905.055	−4,176.573	−3,819.894	−2,212.048	−2,078.189
Akaike Inf. Crit.	13,832.110	8,371.146	7,663.787	4,442.097	4,180.379
Bayesian Inf. Crit.	13,893.000	8,417.076	7,724.115	4,482.914	4,234.065

Note: *p<0.1; **p<0.05; ***p<0.01