Different Stages, Different Constituencies, Different Scores? Estimating Ideology Throughout the Campaign Cycle

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Abstract

Campaign finance based ideological scores are widely used in political science to gain leverage on a number of important substantive questions. In this paper, we investigate the sensitivity of these scores to shifting strategic and competitive contexts associated with the transition from primary election campaigning to general election campaigning. We use campaign finance data made available by Bonica (2024) to create period-specific ideological scores for US House candidates between 2002 and 2018 election cycles. We find that candidates' ideological scores do change from the primary campaign to the general campaign, and that there are some systematic components to this within-candidate temporal variation. Specifically, we find that incumbents' scores are more stable than those of challengers or candidates running in open seat races. Finally, variation in ideological scores from the primary to the general election appears to be a function of the competitive context of the primary election. As the number of competitors in the primary election increases, so does the magnitude of the shift in the winning candidate's score from the primary to the general.

1 Introduction

Candidates rely heavily on campaign donations to finance elections, and scholars increasingly leverage these donations to measure candidate ideology. While the concept of ideology as spatial positioning is well established in studies of legislative behavior and electoral politics (Aldrich 2011; Downs 1957; Poole 2005), translating these positions from donor behavior poses several methodological challenges. Key among these is recognizing that donor decisions are shaped not only by ideological proximity but also by strategic electoral contexts, which change meaningfully over time within an election cycle. Prior work by Bonica (2013, 2014) addresses how the ideological positioning of donors and candidates can be measured through donation behavior. However, a critical question remains understudied: What happens to donor-based ideological scores when electoral contexts surrounding a candidate shift from primary to general elections?

The two-stage nature of American elections provides a unique opportunity to test directly how changes in competitive and strategic contexts affect donor behavior. During general elections partisan distinctions are prevalent, potentially altering donor calculations away from purely ideological considerations toward strategic/partisan support (Carson & Jacobson 2023). Conversely, primary elections feature candidates competing ideologically within their own parties, often highlighting ideological distinctions to attract donors. Furthermore, these strategic dynamics are not uniform across all candidates. Incumbents, benefiting from established visibility, donor networks, and an existing political record, likely experience fewer shifts in ideological positioning compared to challengers or candidates in open-seat races, who must actively differentiate themselves and adapt their ideological messaging to changing electoral contexts.

These differing strategic contexts across election stages and candidate types create challenges when using aggregate campaign finance-based ideological scores. Specifically, ideological measures that combine donation data from primary and general elections may obscure meaningful variation and strategic shifts that are inherently context-dependent. This aggregation complicates comparisons, particularly between successful and unsuccessful primary candidates. Candidates who lose in primary elections do not advance to the general election stage, and thus, their ideological profiles, based solely on primary-stage donations, inherently differ from those who continue competing into the general election, where different strategic considerations shape donor behavior.

In this paper, we use campaign finance data from Bonica (2024) to estimate separate ideological scores for U.S. House candidates during primary and general election phases from 2002 through 2018. This approach allows us to assess directly the degree and sources of within-candidate ideological instability across electoral stages. Our findings indicate significant ideological shifts from primary to general campaigns, with incumbents demonstrating greater stability compared to challengers and open-seat candidates. Further-

more, these shifts systematically increase with the competitiveness of primary elections, suggesting donors' strategic behavior significantly shapes measured ideology.

These results highlight important methodological and substantive implications. Aggregate ideological measures, which blend donations across electoral stages, obscure meaningful strategic shifts, potentially biasing interpretations of candidate ideology. Additionally, comparisons between successful and unsuccessful primary candidates become problematic, as ideological measures for candidates who lose primaries lack general election donation data, data that would likely alter their ideological profiles significantly. We conclude by exploring how changes in campaign finance laws, notably the Citizens United decision, further influence ideological stability across different types of candidates.

The paper proceeds as follows: We first detail the theoretical and strategic distinctions between primary and general electoral contexts. Next, we describe our methodological approach and data. We then present our empirical findings regarding ideological shifts and the factors contributing to ideological stability. Finally, we discuss broader implications for measuring ideology through campaign finance data and propose future avenues for research.

2 Ideological Measurement and the Campaign Cycle

Measuring ideal points is of great interest to a host of questions across disciplines and specialties. As scholars such as Poole & Rosenthal (2011), Clinton *et al.* (2004), and Bonica (2013) suggest, measuring ideology for individuals as atomistic and as part of a broader social institution is fundamental to our ability to understand politics. Thus, to best understand the political world, its actors, and the effects of circumstance we need to properly measure actors' preferences. Nearly all of the political science discipline conceptualizes (if not explicitly models) ideology as a latent variable (Barberá 2015), one that cannot be directly observed but must be inferred through the observation of other variables known to be related to it. The latent variable of candidate ideology is typically conceptualized in the context of a reflective model, with each candidate's ideology assumed to exist as a stable trait.

Given this conceptualization of ideology, the approaches to measuring ideology rely on observable behaviors which locate individuals within a revealed space. Traditionally these have been based on roll call voting estimates, with differences based on approach relative to geometric spacing Poole (2005) or Bayesian simulation Clinton *et al.* (2004). Bonica (2014) offers a new approach with ideal point estimation based on the donations to political campaigns. This approach uses the donations from actors external to political institutions, such as PACs and individuals, to candidates for political office. Just as roll call based ideological measures for legislators assume that voting decisions are a function of the ideological proximity between the

legislator and alternative policy outcomes, campaign finance based ideological measures assume that donation decisions are a function of ideological proximity between a donor and alternative candidates.

Specifically, a donor's decisions about how to allocate a fixed budget of campaign donations across multiple different candidates is conceptualized as a constrained optimization problem in which the donor is trying to maximize some sort of ideological utility by donating to candidates who are close to them in ideological space (Bonica 2013). As Bonica (2014, 369) states, "Formally contributor i considers the set of possible recipients [...] and allocates the vector of contributions y_1 through y_j that maximizes [their] objective function" across candidates 1 through j. Using the donations from a single donor across candidates and a single candidate's election across donors, Bonica (2014) creates CFScores to put political actors on a common scale. In creating these scales, Bonica (2014) provides a set of assumptions, namely that (1) donor preferences are single peaked and roughly normal, (2) proximity drives donor behavior, and (3) donors have the same preferences across levels of government. These assumptions, while completely reasonable, rest upon an additional assumptions that donations are identical across the lifespan of an electoral campaign and candidate types.

The difference between primary and general elections is not new to political observers (Fenno 1977). Among other explorations, Burden (2004) discusses the difficulties in unders tanding candidate ideology across the election cycle, Hill (2015) demonstrates the differences between primary and general electorates, and Hall & Thompson (2018) finds different causes and effects for candidate extremism in primaries. In short, scholars are aware of the differences between the environments, pressures, and effects of primary and general elections. However, what this difference between primary and general elections means for candidate ideology is difficult to capture from existing measures, even when careful about assumptions in the data (Fowler *et al.* 2021; Kujala 2020). When using scores that encompass the campaign or legislative session, it is difficult to capture how primaries differ from general elections. The effect of this difference in campaign environments appears most starkly in the effect of the second assumption in Bonica (2014) when taken across a campaign.

Candidates in primary elections tend to be more ideologically extreme than their general election counterparts, especially given the inter-party polarization and intra-party homogenization of the past forty years (Page & Gilens 2020). This has seen fewer moderate candidates emerge for office, generating a different environment in primary elections (Thomsen 2014, 2017). Taking this into account implies that donors are likely not seeing identical circumstances across cycles within an election (Meisels *et al.* 2024). Additionally, the behavior of donors varies across election types, with incumbents receiving increased donations (Jacobson & Carson 2019) and open seat elections being more open to amateur candidates with early fundraising advantages (Porter & Steelman 2023).

If we assume, as does Bonica (2014), that proximity drives donor behavior then we must understand that each donor observing a candidate is observing a given circumstance. Previous scholarship tells us that this circumstance is flexible not only across elections but also within them. Thus, to properly understand the donor-based perceptions of candidates we need to clarify that donations are given *in a specific context.* Federal election law sees donations in the primary and general election campaigns as separate events, explicitly building into the structure of donations a difference in observed behavior. The amount of competition in a primary will shape how donors see their proximity to a given candidate, as the circumstance for a donor choosing between candidates is more complex than if a candidate runs unopposed. In other words, scores generated from primary election contributions may be different from scores for the same candidate in the general election based on the type of candidate and the circumstances around that candidate in the primary election.[1] If campaign donations can be thought of as "reflections" of candidate and donor ideologies, the relationship between the latent trait (ideology) and its indicators (donations) differ systematically across stages. The competitive electoral context to which both donors and candidates are responding changes from the primary election to the general election in important ways. For example, scholars show that the size of the relevant candidate pool influences the clarity of behavior (Cunow *et al.* 2021), with increased options decreasing accuracy and knowledge. Additionally, the lack of a clear signal in primary elections versus general elections provides different signals to contributors (Mutz 1995). Whereas during a primary election a donor may choose from any of several candidates who share their party label, with a potential incentive to choose candidates who are closer to them in ideological space, the choice set during the general election can be much smaller. This drives donors to contribute among a more defined set of choices, thereby constraining how they can behave.

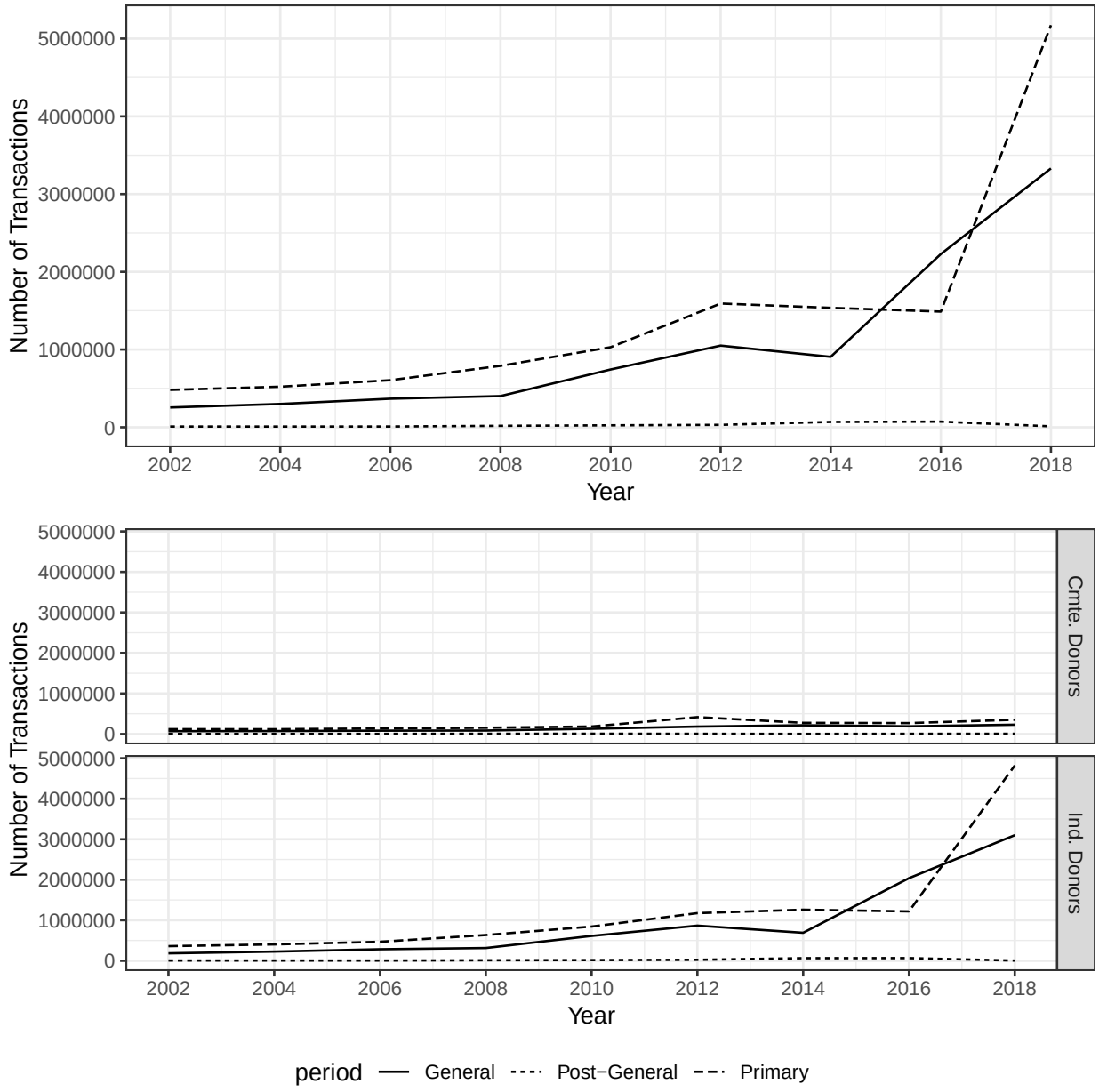
3 Dynamics of Candidates, Donations, and Election Cycles

The structures for campaign finance provide distinct periods. The first, primary elections, run from the declaration of candidacy to the date of the primary (Porter & Steelman 2023). The second, general elections, run from the end of the primary election to the end of the campaign (Hassell 2011). These distinctions are borne out in the Federal Election Commission's limitations on donations per election that view these two events as separate entities. Donations can continue after the date of the general election, but the Federal Election Commission views this as a separate period for donations. Thus, we include these donations in our

[1]Stated differently, Bonica (2014) leads to an expectation that scores from the primary election should be the same as, or very similar to, scores generated from general election contributions, because the reflective assumption is that the donations made in both of these periods are related to candidate ideology in the same way. At least, differences between primary and general scores should be mostly a function of the precision of the estimates – driven by something like more donations in one than the other, rather than by something systematic.

overall exploration of these data while following the FEC in classifying them as a third category —thus not including them in the primary to general election ideal point change analysis below.

Figure 1: Number of Transactions by Period



To understand donations in different periods, we begin with an exploration of these donations across different periods within a campaign. These data span from 2002 to 2018, with each part of the election cycle mentioned above—primary, general and, post-general—presented as a unique period.[2] First, we look at the

[2]For these figures we removed all donations lower than 200 dollars and above 5000 dollars. This is done due to likely moti-

number of campaign donations by period—again distinguishing between donations made before the end of the primary election, from the end of the primary election to the end of the general election, and after the general election—in Figure 1.

We see several interesting features of campaign donations in Figure 1. First, the top pane shows that for most years, the majority of campaign donations to US House candidates are made during the primary election season. For example, the 2010 election has roughly 56% of donations given during the primary election. The only exception to this is the 2016 election, which featured more donations during the general election. Second, we see that the raw number of transactions generally increases over time. Looking at the bottom pane of Figure 1, it is clear that this trend is driven primarily by donations from individual donors.[3] While we do not focus in the analysis on different donation types, we include them here to illustrate the differences by cycle. In nearly all cases, whether we are looking at donations from individuals or from committees (PACs, businesses, etc.), primary donations are more frequent than general election donations, and both are always more frequent than donations given after the end of the general election.

The amount given is also of great interest, and we consider this in Figure 2. The first pane in this figure presents the average donation amount by period. We see that for all elections in our sample, the largest donations are given in the post-election period, while the lowest average donation is largely during the general election.[4] We also see that the average donation size is generally increasing over time, though some years feature stagnation or slight decline in average donation size. This is perhaps not surprising given inflationary tendencies over time affecting the value of a dollar and the relatively fixed size of the FEC's limit.[5]

The bottom pane of Figure 2 breaks down donation amounts by the type of candidate, with challengers in the top third, incumbents in the middle, and open-seat candidates on the bottom third. We see here that there are significant differences in donation amounts for each type of candidate. Taking incumbents, the middle of the bottom pane, it generally appears that there is little difference in average donation size across the different periods. With the exception of 2006 and 2018, the average donation size in each period is nearly identical. This is not the case for challengers at the top of the pane and candidates for open seats at the bottom of the pane. For these candidates, the average donation in the primary and general periods

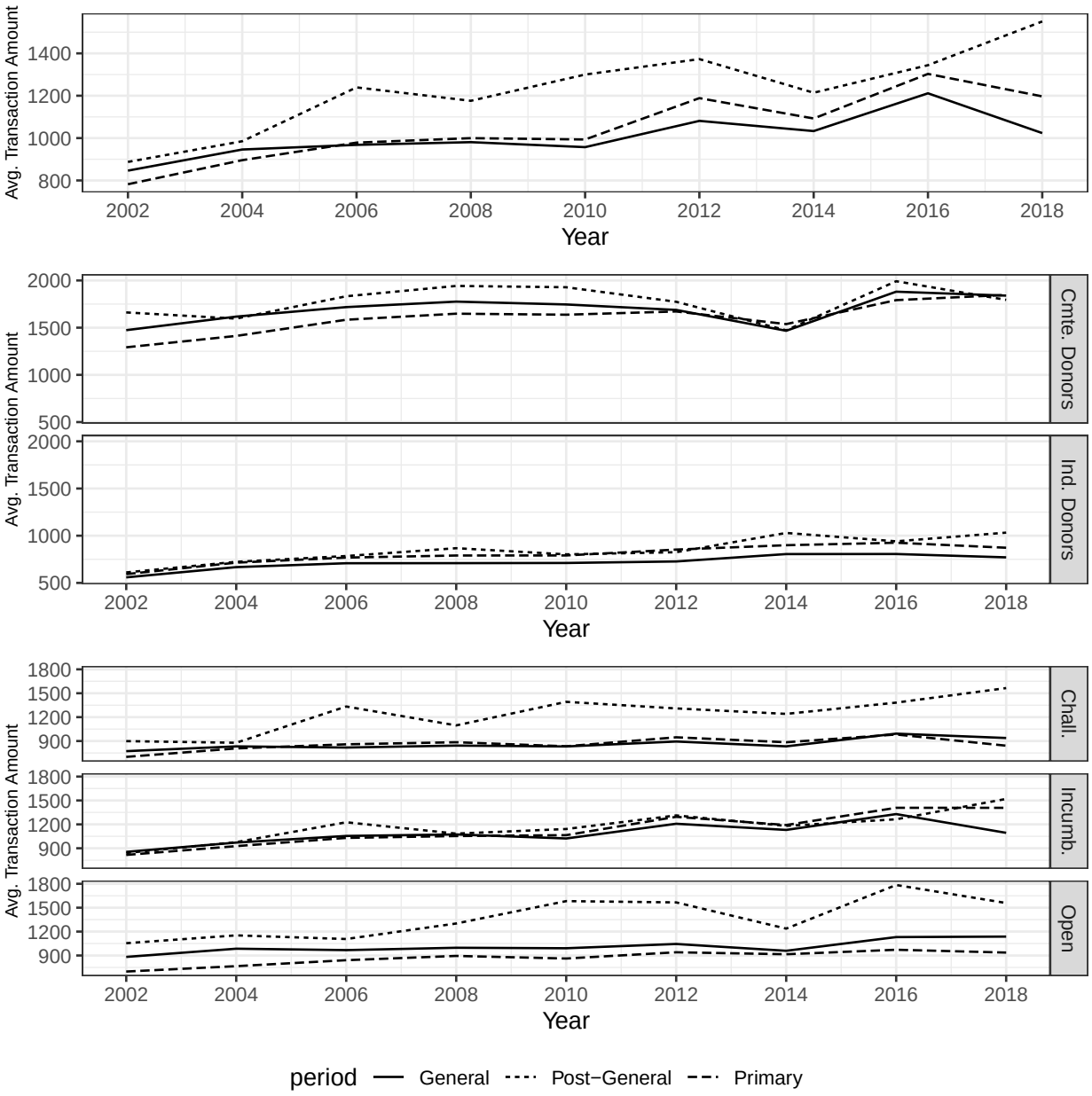
vated (and inconsistent across campaigns) behavior in reporting donations under the Federal Election Commission's minimum reporting threshold of 200 dollars and the violation of legal structures for donations above 5,000 dollars. Winsorising scores above 5,000 dollars produces figures which are much the same, and including the raw amounts produces data in 2012 and 2014 which make little sense given legal limits.

[3]We see the dramatic growth of donations from individuals in 2016 and 2018 in the bottom pane of 1. However, we do not directly address this as it lies outside our purpose in this paper.

[4]Though we do not consider it in the analysis below, the post-election period is of interest in future work. For example, the 2010 election year had a post-general election donation average of $1,295 per contribution. These contributions, made after the general election has been decided, are typically for the purpose of helping to retire a candidate's campaign debt. It is unclear the extent to which we should think of these contributions as being driven by the ideological proximity between donor and recipient.

[5]We also present the information in Figure 2 by donor type, and present this in the Appendix.

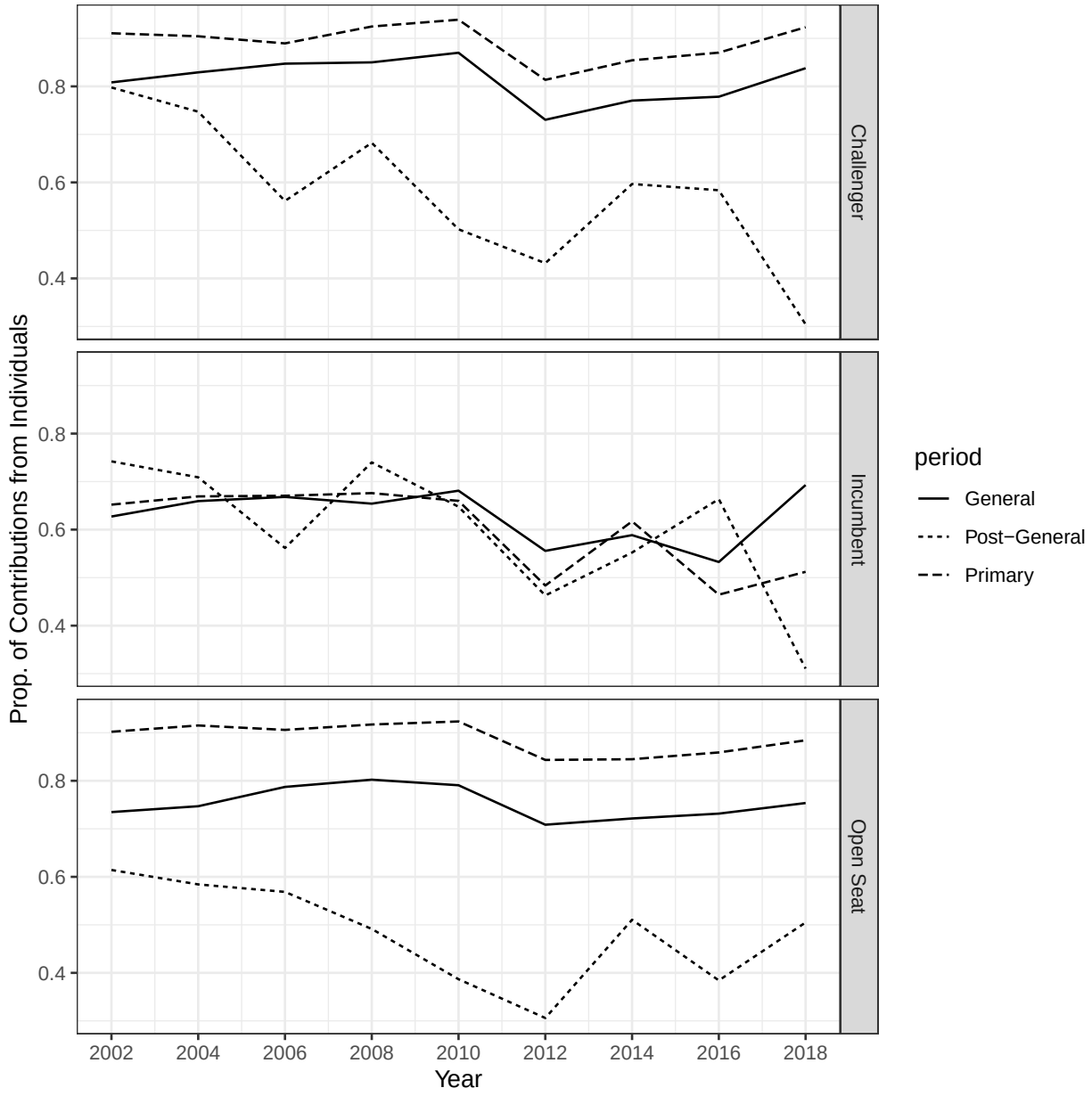
Figure 2: Donation Amounts by Period, Donor, and Candidate Type



are much lower than the post-general election period in almost all years.[6] For challengers to incumbents, their average donation size is nearly identical between the primary and general election periods, with the donation amounts moving together across election years. For open-seat candidates, we see that the general election amount is always greater than the amount for primary elections in our sample. Thus, it appears that types of donors behave differently, and they donate differently depending on the type of candidate to which they give.

[6]We again do not focus on this in the current paper, though note its pattern.

Figure 3: Donation Proportions by Period and Candidate Type



Finally, we also look at who gives to different types of candidates in Figure 3. This figure considers the proportion of donations received by campaigns from individual donors, with higher values on the y-axis meaning a greater proportion of donations in a period received from individuals. The different types of candidates are in each pane, with challengers in the top third, incumbents in the middle, and open seat candidates on the bottom third. We again separate each period as well. Beginning with incumbents, the middle pane, first, it generally appears that there is little difference in the mix of donor types by period in

most years. While some years, such as 2012 and 2018, have general elections with the highest proportion of donations from individuals, 2008 and 2016 have post-general as the highest proportion from individuals and 2014 has primaries as the highest proportion from individuals. We also see that the proportion from individuals moves across election years, with some higher and some lower, but all generally near 60 percent from individuals with limited exception.

This is not the case for challengers and open-seat candidates in Figure 3. For both of these candidate types, the highest proportion of donations from individuals is always in the primary election, with candidates of both types receiving nearly 90% of their donations in primary elections from individuals. General elections have slightly more donations from committees, with between 72 and 86% of donations from individuals for challengers and 70 to 80% of donations from individuals for open seat candidates in this cycle. We observe a stark drop-off in donations from individuals in the post-general period, which only three election years having above 60% of donations from individuals in the post-election period for challengers. This is even more stark for candidates in open-seat races, with only 2002 above 60% from individuals and only three election years above 50%.

Thus, while the majority of all campaign contributions come from individual donors rather than PACs, corporations, or interest groups, these figures demonstrate significant variation in the size and breakdown of these donations. While much giving may indeed be sincere, we observe significant differences across parts of elections and types of candidates (Barber *et al.* 2017). Thus, it appears that donations are inconsistent across stages of an election, and likely different across different types of candidates. In what follows, we consider for whom these variations are likely to occur and under what circumstances these changes occur.

4 Which Candidates Move Across Election Cycles?

We expect there to be shifts in measured ideological scores from primary to general elections for nearly all candidates. This expectation stems first from the nature of the choice set that donors see. The nature of multiple election cycles changes not only the candidates available to donors, but also the existence and definition of different heuristics across campaigns (Johnson 2010). Donation decisions in a primary election, in which candidates' partisanship is identical, may be particularly sensitive to slight differences in ideological proximity between the donor and the recipient. In the general election, on the other hand, the salience of ideology to the donation decision *independent of partisanship* diminishes substantially. In the context of the general election, the donation decision becomes not so much an ideological decision as a partisan decision.

The relationship between ideology and campaign donations, then, is partially dependent on the choices available to a donor. Donors in primary elections may be motivated to donate to candidates with similar

issue profiles, ideological preferences, or some other desirable non-party heuristic cue. In the general election, the similarity cue has been substantially muted, as a partisan cue exists that was not present in the primary election. As Porter & Steelman (2023) demonstrate, the timing of donations shape candidate success in primary elections in a fashion which is substantively different than general elections. Thus, we think that the salience of ideological and non-ideological factors with respect to campaign donation decisions changes meaningfully throughout the stages of a campaign cycle. That is, what changes is not the candidates themselves but the choices of candidates available to donors at each stage—and ideological scores based on campaign finance data likely reflect these changing choice sets.

While some giving may be ideological, political giving is not *exclusively* ideological. Some donations, particularly those coming from interest groups or PACs, may be targeted for the purpose of ensuring access after the election (Denzau & Munger 1986; Snyder Jr 1992; Crosson *et al.* 2020). In this case, the most important factor in the donation decision is presumably some perception about the likelihood of electoral victory, rather than anything having to do with ideological proximity between donor and candidate.

This is likely to disproportionately affect incumbents over and above any other type of candidate, as these candidates differ from all others in important respects for potential donors. First, incumbents structure the position they hold to maximize the advantages given to them (Fiorina 1989). This provides them with advantages stemming from increased government-provided resources such as staff and ease of travel (Cox & Katz 1996). This allows incumbents to pursue increased donations and meetings with interest groups, furthering their connection with potential donors. Second, incumbents have a record against which they can be perceived by donors. Canes-Wrone & Shotts (2007) demonstrate that elections can, and indeed often do, induce ideological rigidity in candidates even when voters would prefer changes due to new information. We expect that interest groups understand this ideological rigidity, whether natural or induced, and thus support incumbents due to this fore-knowledge of preferences in the next legislative session. This is despite research by Canes-Wrone *et al.* (2002) and Carson *et al.* (2010) showing that incumbents are judged against their relative partisanship by voters, and thus that members who behave in a manner inconsistent with their expected results are punished by voters.

This difference for incumbents also stems from the desire for potential donors to gain advantages in the legislative process. A long line of research, starting with Hall & Wayman (1990), suggests that donors use their expressed behavior for donations to gain access and influence to legislators. Carson & Jacobson (2023) and others expand on this to show the disproportionate effects of incumbency on fundraising totals, with Fouirnaies & Hall (2014) showing that incumbents raise more money than similarly situated challengers. This desire for access pushes donors to prefer incumbents at all steps of the process—for reasons that may not be closely tied to ideology.

This also comes from the broader environment in which donors give. Cross-party donors are, as Brunell (2005) suggests, interested in least effects. That is, these PACs are interested in gaining access but are trying to do so in the least impactful ways to the ultimate election outcomes. Given the disproportionate success in elections for incumbents even accounting for other features of elections (Fowler 2016), this means that PACs should favor incumbents at all stages. In short, the rigidity of incumbents in ideological behavior, the preference for access in the halls of government, and the desire for cross-party donations to have the least impact push PAC donors to give to incumbents in both primary and general elections. This reduces the variation exhibited across cycles, making incumbent scores less variable. Following this logic, our first hypothesis states:

H1: The ideological scores of incumbents will be more stable from the primary election to the general election, compared to the ideological scores of challengers and candidates in open seat races.

The magnitude of the within-candidate shift in ideological score should also be a function of the characteristics of the primary contest. Incumbents have the capacity to "scare off" candidates, a phenomena not new to Congressional elections (Carson *et al.* 2007; Treul *et al.* 2022). This implies that candidates who are competing in low-competition primaries, and especially those running unopposed, should should exhibit little variation from the primary to the general period in their ideological score. In donors' minds, the candidate is the inevitable nominee of the party, and therefore the competitive context of the race is stable throughout. The candidate is always seen in contrast to the other party's eventual nominee, rather than first being evaluated against a group of copartisans and then being put forth as the party's standard bearer.

On the other hand, a candidate running in a crowded primary field will need to differentiate herself in some way, and that may require appealing to a relatively niche group of supporters. Hall & Snyder (2015) demonstrate that candidates in more crowded primaries have less concentrated fundraising patterns. Additionally, while Brady *et al.* (2007) show that candidates resolve pressures in primary elections by positioning themselves closer to the primary electorate, Burden (2004) shows that candidates in those same stiff primaries become further from the district's median voter. Thus, the competitive context of a primary election dictates how candidates can present themselves – and therefore how donors are likely to perceive a given candidate.

Candidates in crowded primaries emerge from one competitive context with its own set of strategic incentives and are placed in another, very different competitive context. Donation decisions in the second election are likely driven primarily by partisanship rather than subtle differences in ideological proximity,

causing donors to perceive a candidate from a crowded primary differently in a way that is not the case for a candidate running relatively unopposed. Thus, our third hypothesis states:

H2: The magnitude of the within-candidate shift in ideological score from the primary to the general will be increasing in the number of candidates running in the primary of that candidate's party.

The relationship between candidate types and electoral dynamics is shaped in part by the current campaign finance regime—the rules that determine who can give money, how, and when. Should those rules change, different patterns could emerge. The discussion that follows assumes the legal framework in place in 2025, still anchored by *Citizens United* (2010). Under earlier regimes, the same relationships might have been weaker or altogether different. Crucially, even the Bonica scores we rely on—constructed from donation patterns—are sensitive to these legal constraints. Any use of such scores must therefore recognize that the data-generating process itself depends on campaign-finance law, which can shift for reasons that are anything but exogenous. Indeed, the entire enterprise of inferring ideology from contributions rests on these rules; if the legal regime were to be drastically altered, the "price signals" embedded in donations could change dramatically, much as shifts in market regulation reshape supply-and-demand relationships. The consistency of the measure rests on the idea that changes to the legal regime minimally disrupt the data-generating process, something we cannot know without empirically testing it.

Before testing our hypotheses, we describe our data and our methodology for generating period-specific CFscores for the primary and general election periods. Then, after providing a descriptive analysis of the scores we generate, we move on to hypothesis testing.

5 Data

We start with datasets of contribution records for each election between 2002 and 2018, accessed through the DIME website (Bonica 2024). We subset each of those datasets to look only at federal House races. To supplement this data with more information about recipients of campaign contributions, we downloaded recipient data from the same website linked above. In this dataset the unit of analysis is a candidate/recipient in an election cycle. We subset this data to look only at federal House races in each election cycle from 2002 to 2018.

For each election year, we merge the contributions data with the recipient data using the shared recipient ID field (bonica.rid) and keeping all observations in our version of the contributions data. We also merged in data on the primary election dates for each state in each election year so that we could code a variable

that would identify each contribution as pre-primary, general election, or post-general election.[7] Finally, we subset this data to only include statutory candidates who actually competed in a primary election, and we drop donations to candidates for territorial delegate or resident commissioner positions.

6 Methods

For each election from 2002 to 2018, we assigned candidates an ID based on the period (primary, general, and post-general) in which they were receiving donations. We then collapsed the data to the candidate-period-donor level, summing donation amounts at that level. For example, if donor A gave candidate B three separate $100 donations leading up to the primary election, that would constitute one observation in our collapsed data in which donor A gave candidate B $300 in the primary period. If the same donor A were to make two separate $100 donations to the same candidate B between the primary and the general election, that would constitute another separate observation in our collapsed data in which donor A gave candidate B $200 in the general period.

Having collapsed the data in this way, we created subsets requiring each candidate in each period to have received contributions from a minimum of five donors, each of which also had to have made contributions to at least five candidates. This process yields a two-way frequency table for each election with donors as the rows and candidates as the columns, with each cell containing information on the amount of donations from a specific donor to a specific candidate in a specific period.[8] In order to run correspondence analysis on each of these frequency tables, they were converted into matrices of χ^2 distances, upon which the singular value decomposition (SVD) was performed (Greenacre 2017).[9] In accordance with traditional ideological measures, we set the poles so that negative scores were more liberal and positive scores were more conservative.

One drawback of our approach is that it does not allow us to account for the candidate-level structure of the data in generating scores, as there is nothing explicitly linking candidate A in the primary election with candidate A in the general election (since general candidate A and primary candidate A are technically treated as different candidates in our method). However, our use of a common set of donors within election year serves as a bridge for candidates across periods (primary, general, and post-general), which allows us to

[7] In coding the variable that sorted contributions into periods, we realized that, despite subsetting by election year, there were contributions with dates that did not make sense. For example, in the 2010 election data, 45 contributions had the year 0000, one contribution had the year 1900, 130 contributions had the year 2004, 868 had the year 2020, etc. We decided to keep all contributions that were made in the year prior to the election, the year of the election, and the year after the election, and drop the others. Again using 2010 as an example, we dropped 2,790 observations, taking our dataset from 1,802,966 observations to 1,800,176 contributions.

[8] The raw dollar amounts were transformed into bins, as described in the codebook made available with the DIME database (Bonica 2024). Contributions between $1 and $100 are coded as 1, contributions between $101 and $200 are coded as 2, and so on. Any contribution of $5,000 or more is capped at 50.

[9] While the correspondence analysis for each election also generated ideological scores for donors, our concern in this paper is with the scores generated for the candidates.

make within-candidate comparisons from one period to the next. Once we have created scores for all election years, we z-score normalize these scores within election year.

Ultimately, this process allows us to generate ideological scores for 4,634 unique candidates in elections from 2002 to 2018.[10] Because a candidate shows up as a separate observation for each period during which they receive sufficient donations within an election, there are actually 18,118 candidate-period-year ideological scores generated. The wide version of this dataset, in which a candidate-year pairing constitutes an observation and period-specific scores are included as columns, has 8,689 observations. Of these observations, 5,717 candidate-year observations have both a primary election score and general election score, allowing us to create a variable measuring the within-candidate score change from the primary to the general.[11]

Data on primary election scores, general election scores, Bonica's CFscores, and other candidate, district, and race-level information were merged into one dataset. The important variables for hypothesis testing in the next section are:

- Ideological scores for each candidate (including primary election scores, general election scores, Bonica (2024) CFscores, and DW-NOMINATE, where applicable)
- The within-candidate difference in ideological z-scores from the primary election to the general election, measured as an absolute value.
- A coding of candidate type, provided in Bonica (2024), that identifies candidates as either incumbents, challengers, or candidates in open seat races
- The number of candidates that competed in each primary competition.[12]
- The total amount of unique contributors and the total receipts (both logged) by a given campaign in the primary. These are variables that could confound the relationship between incumbency and the within candidate score differences
- A series of district-level variables that could address other heterogeneities in campaign behavior, including percent Black, unemployment, percent college-educated, median income, and population density.

[10] Not every candidate has a score for all three periods within each election—scores are only generated when sufficient data exist.

[11] To the extent that the number of observations in the models presented below are lower than 5,717, the excluded observations are dropped due to missingness in the independent variables.

[12] This variable was coded by collapsing the DIME dataset for US House candidates on a district-party variable, and summing the observations that went into each group. So, for example, if there were five candidates in the Republican primary in Florida's 24th district, the variable for that district-party pair would take on a value of five. This variable was then merged into the main dataset we use for our analyses using a shared district-party field. Then, for each of the five Republican candidates from FL-24 in our data, this variable took on a value of five.

7 Results

Figure 4 shows candidates positioned by their general election scores (called General CFscores) on the y-axis, and their primary election scores (called Primary CFscores) on the x-axis. Candidates have been color-coded based on party. While the scores are clearly correlated with one another, dispersion does exist—particularly moving towards the ideological extreme of either party. This provides suggestive evidence that within-candidate scores will fluctuate across election periods.

Figure 4: Comparing Primary and General CFScores

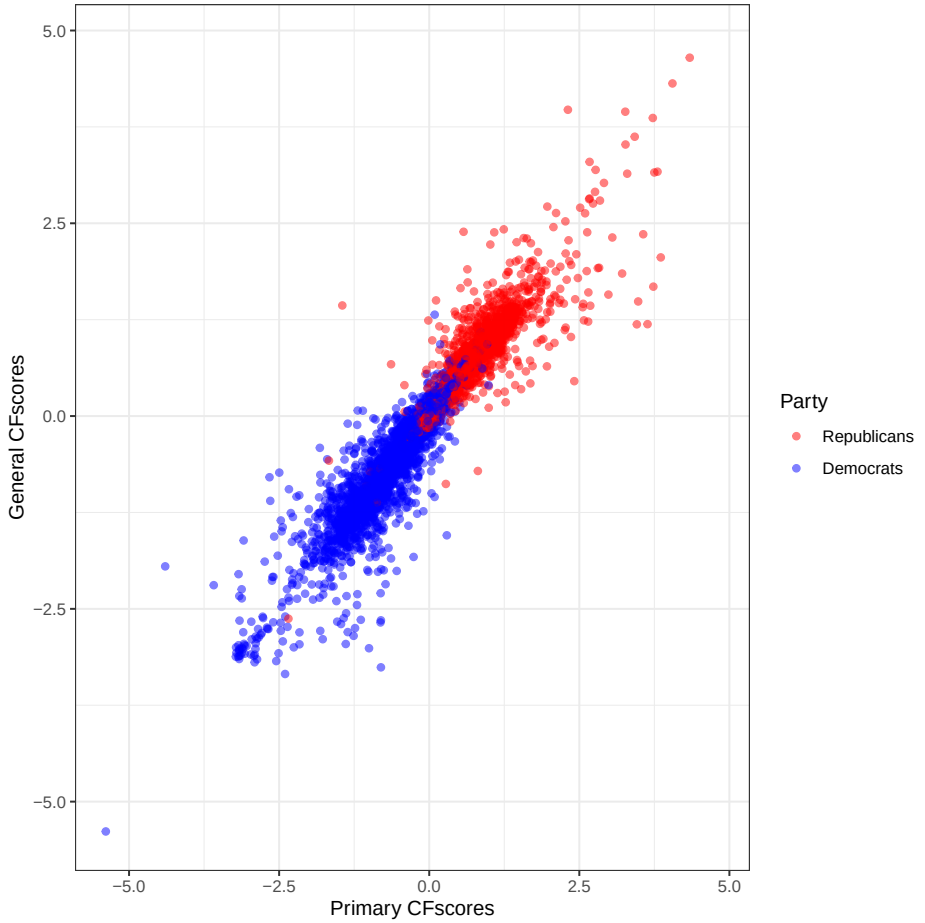


Figure 5 shows the correlation between both of the scores we have generated (on the x-axis), and Bonica's CFscores (on the y-axis).[13] Rather than being color-coded by party in this plot, candidates are color-coded based on the campaign cycle from which their score is constructed—teal for primary election scores and orange for general election scores. To aid visualization, both the Primary CFscores and the General CFscores are Winsorized based on the observed minimum and maximum values of Bonica's CFscores. The lines are based on separate linear regressions of Bonica's CFscores on each of the period-specific CFscores.

[13]This plot uses Bonica's dynamic scores, estimated separately for each election year.

Figure 5: Comparing our Period-Specific CF Scores with scores from Bonica (2014)

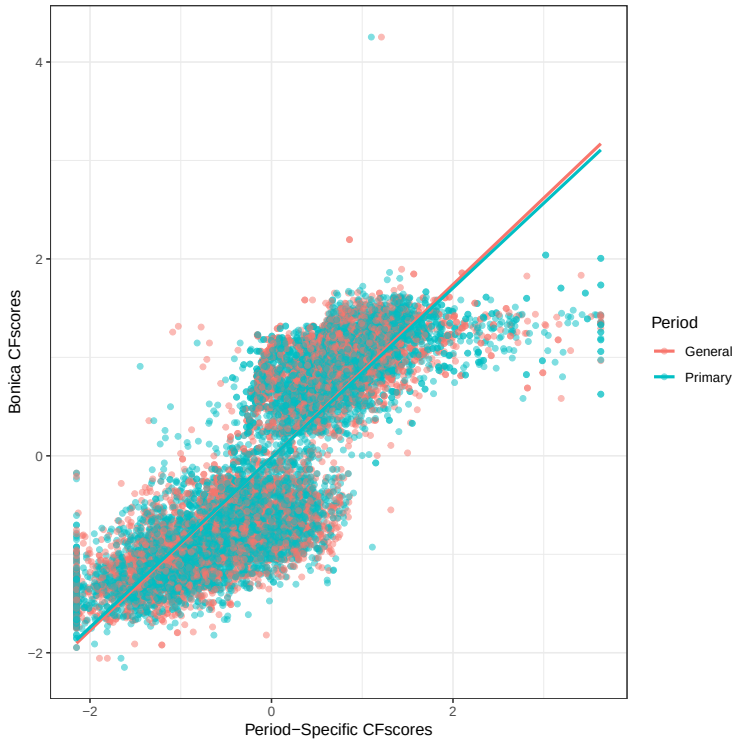


Figure 6 shows the same Winsorized period-specific CFscores on the x-axis, plotted against DW-NOMINATE on the y-axis. While both the period-specific CFScores we generate are positively correlated with DW-NOMINATE, it is clear from the scatterplot that this correlation is driven mostly by interparty differences in candidate ideological scores. Within-party, the period-specific CFScores scores do not appear to be particularly highly correlated with DW-NOMINATE. This fits with recent findings by Barber (2022)—and we replicate the figure from his paper using our primary and general election CFScores.

Figure 7 shows correlations between DW-NOMINATE and our period-specific CFScores—for all House members (black lines in the plot), and then broken out by party (red for House Republicans, blue for House Democrats). The general patterns are similar to those in Barber's paper—looking at all members together, CFScores appear highly positively correlated with DW-NOMINATE scores throughout the time period we study. However, the positive correlations are weaker when we examine partisan subsets, and for nearly half of our timespan, CFScores of Democratic House members are actually negatively correlated with their DW-NOMINATE scores (2006, 2008, 2012, 2014, and 2018 when considering primary CFScores, and the same years plus 2016 when considering general CFScores). Also echoing Barber's findings, correlations between CFScores and DW-NOMINATE scores for House Democrats are generally declining over time, whereas, with the exception of some noise, correlations for House Republicans are staying relatively stable.

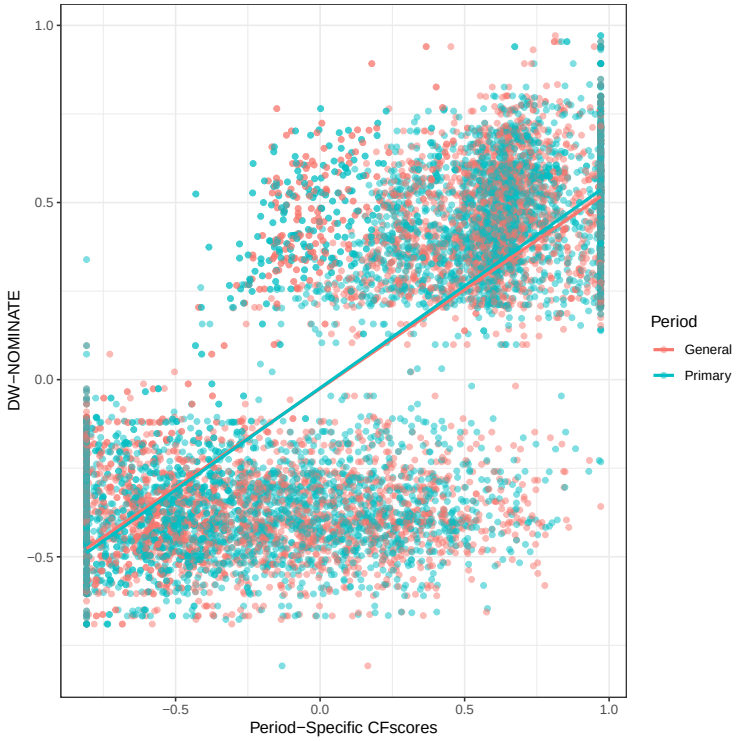
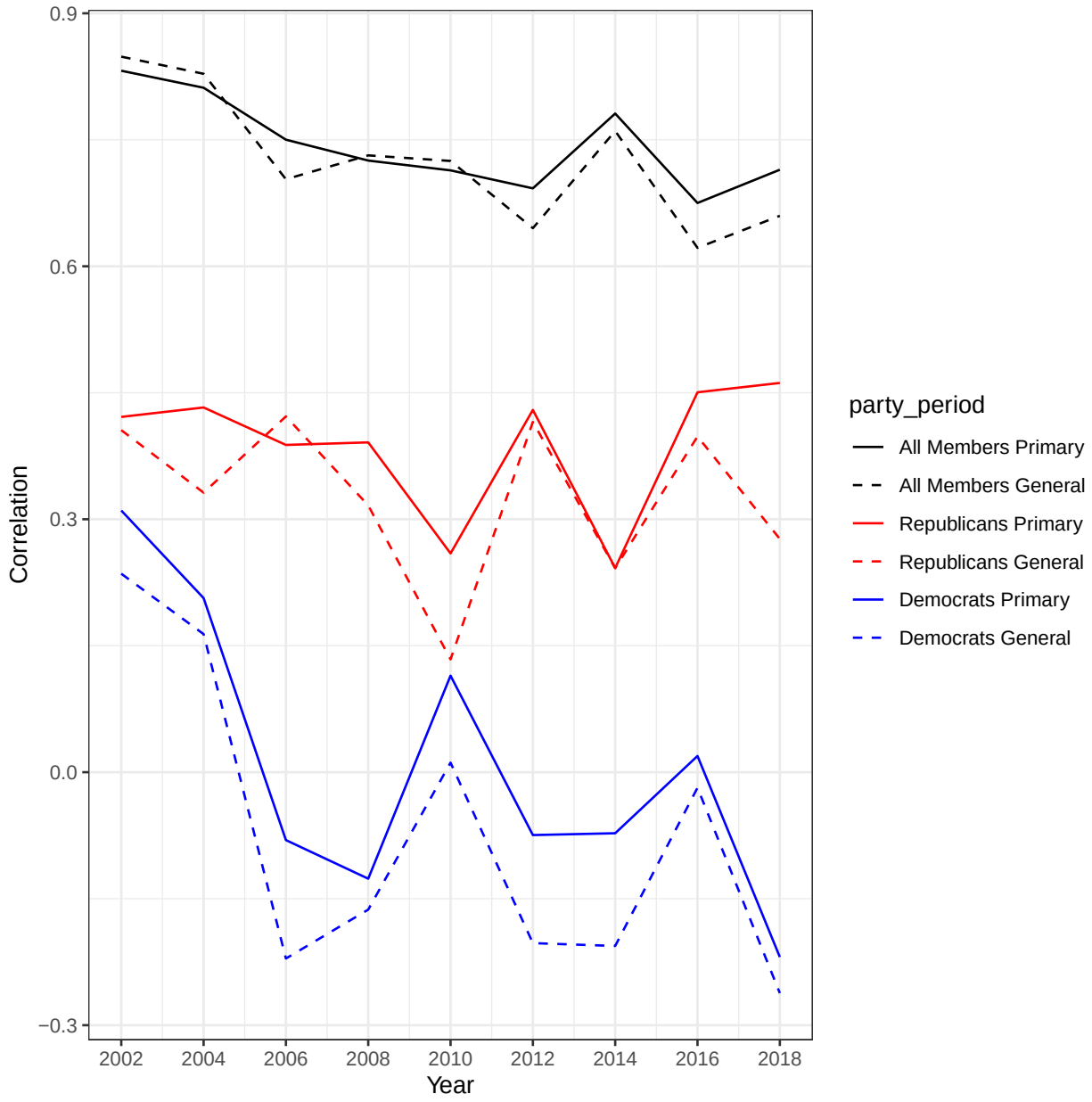


Figure 6: Period-Specific Scores vs. DW-NOMINATE

Interestingly, CFScores from primary election donations typically have stronger positive correlations with DW-NOMINATE than do CFScores from general election donations.

Figure 7: Replication of Barber (2022) with Primary and General Scores



Having explored fluctuations in period-specific CFScores, we now move onto regression modeling for an examination of systematic factors that may help explain within-candidate variation. Again, the fact that candidates' ideological scores shift from the primary election to the general election is not inherently concerning from a measurement standpoint. However, if those shifts are systematically related to candidate and election characteristics, that should raise concerns about the advisability of measures that treat candidate

ideology as a stable latent trait by combining donations across primary and general elections.

Table 1, below, displays the results of three OLS regression models meant to explain variation in the shifts in ideological scores from the primary to the general election as a function of candidate and primary election characteristics. The dependent variable in all three models is the absolute value of the difference between a candidate's Primary CFscore z-score and their General CFscore z-score. The unit of analysis is a candidate-year pairing. Because we have panel data, we set up our models in a two-way fixed effects framework, with fixed effects for both candidate and election year. We hypothesize that incumbency status should induce stability in ideological scores from the primary to the general election—but we want to isolate the effect of incumbency itself, rather than picking up on other differences between the group of candidates who happen to be incumbents and those who are not. Our model structure allows us to hold the candidate constant and estimate the effect of a candidate *becoming* an incumbent on the stability of their ideological scores.

Table 1: Effect of Incumbency on Primary to General Shift in Scores

	Dependent variable:		
	|Primary - General Score|		
	(1)	(2)	(3)
Incumbent	−0.156***	−0.095***	−0.096***
	(0.014)	(0.016)	(0.016)
Num. Candidates in Primary		0.024***	0.025***
		(0.004)	(0.004)
Num. Unique Primary Donors (Logged)		0.045**	0.043**
		(0.016)	(0.016)
Total Primary Receipts (Logged)		−0.037*	−0.035*
		(0.017)	(0.017)
Num.Obs.	5717	5709	5677
R2 Adj.	0.447	0.466	0.455
R2 Within Adj.	0.060	0.094	0.094
Std.Errors	by: bonica.rid	by: bonica.rid	by: bonica.rid
FE: bonica.rid	X	X	X
FE: cycle	X	X	X
District Covariates			X

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

All three models are linear regression models with fixed effects for candidate and cycle. We cluster standard errors on at the candidate level. Our dependent variable is the absolute value of the difference between scores estimated on donations made during the primary and scores estimated on donations made during the general election. District covariates include: percent Black, unemployment, percent college-educated, median income, Democratic presidential vote, and population density

The only covariate included in the first model is an indicator variable for candidate incumbency status (1 if the candidate is an incumbent, 0 if not). The second model includes covariates that are specific to the

primary election context—the number of candidates competing in each primary,[14] the (logged) number of unique donors who gave to each candidate during the primary, and the (logged) number of total campaign receipts for each candidate in the primary. We condition on these last two variables (logged number of primary donors and receipts) as they could confound the relationship between incumbency and the precision of the ideology scores estimated in each period. The third model includes these covariates and a number of district-specific socioeconomic and demographic covariates: percent Black, unemployment, percent college-educated, median income, Democratic presidential vote, and population density.

All models provide strong support for Hypothesis 1, as the negative and statistically significant coefficients on the Incumbent variable demonstrate that the ideological scores of incumbents move less than those of non-incumbents. Depending on the model specification, the effect of incumbency is roughly 40-65% of a standard deviation in the dependent variable. The second and third models provide support for Hypothesis 2—for each additional candidate running in a primary election, a given candidate's ideological score is predicted to change by roughly 10% of a standard deviation from the primary election to the general election.

Table 2 compares results for our full dataset with results from models fit on partisan subsets of the data. The stabilizing effect of incumbency on candidate ideological scores is stronger for Republican candidates than it is for Democratic candidates, but the effect of primary competition on ideological score changes is roughly the same across parties. Hypotheses 1 and 2 appear to hold for both Republican and Democratic candidates, although with interesting variation in the magnitude of the incumbency effect.

[14] While this is technically a district-party-level variable, it is effectively a candidate-level variable, as it almost always applies only to the winner of the primary election in each district-party pairing.

Table 2: Effect of Incumbency on Primary to General Shift in Scores by Party

	Dependent variable:		
	|Primary - General Score|		
	All Candidates	Democrats	Republicans
Incumbent	−0.096***	−0.056**	−0.101***
	(0.016)	(0.022)	(0.022)
Num. Candidates in Primary	0.025***	0.024***	0.025***
	(0.004)	(0.006)	(0.005)
Num. Unique Primary Donors (Logged)	0.043**	0.019	0.079*
	(0.016)	(0.017)	(0.035)
Total Primary Receipts (Logged)	−0.035*	−0.005	−0.063*
	(0.017)	(0.024)	(0.029)
Num.Obs.	5677	3030	2647
R2 Adj.	0.455	0.411	0.527
R2 Within Adj.	0.094	0.037	0.149
Std.Errors	by: bonica.rid	by: bonica.rid	by: bonica.rid
FE: bonica.rid	X	X	X
FE: cycle	X	X	X
District Covariates	X	X	X

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

All three models are linear regression models with fixed effects for candidate and cycle. We cluster standard errors on at the candidate level. Our dependent variable is the absolute value of the difference between scores estimated on donations made during the primary and scores estimated on donations made during the general election. District covariates include: percent Black, unemployment, percent college-educated, median income, Democratic presidential vote, and population density.

Table 3 replicates Table 2 but with a factor delineating open-seat and challengers as distinct levels (and now making incumbent the reference group). The modeling strategy is otherwise identical. Interestingly, while the results for Democratic candidates in Table 2 indicate that incumbents' scores change less from the primary to the general than do non-incumbents', the results in the middle column of Table 3 suggest that the incumbency effect may have been a product of lumping challengers together with candidates in open seat races. In the full dataset and the Republican dataset—columns 1 and 3 respectively—the ideological scores of both challengers and candidates in open seat races move more than incumbents' scores by roughly the same magnitude.

Table 3: Effect of Candidate Type on Primary to General Shift in Scores

	Dependent variable:		
	|Primary - General Score|		
	All Candidates	Democrats	Republicans
Challenger (Ref: Incumbent)	0.097***	0.043	0.105***
	(0.027)	(0.045)	(0.028)
Open Seat (Ref: Incumbent)	0.095***	0.074	0.095**
	(0.026)	(0.049)	(0.029)
Num. Candidates in Primary	0.025***	0.023***	0.025***
	(0.004)	(0.005)	(0.005)
Num. Unique Primary Donors (Logged)	0.043**	0.019	0.079*
	(0.016)	(0.017)	(0.034)
Total Primary Receipts (Logged)	−0.035*	−0.007	−0.062*
	(0.017)	(0.023)	(0.029)
Num.Obs.	5677	3030	2647
R2 Adj.	0.455	0.411	0.526
R2 Within Adj.	0.094	0.037	0.149
Std.Errors	by: bonica.rid	by: bonica.rid	by: bonica.rid
FE: bonica.rid	X	X	X
FE: cycle	X	X	X
District Covariates	X	X	X

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

All three models are linear regression models with fixed effects for candidate and cycle. We cluster standard errors on at the candidate level. Our dependent variable is the absolute value of the difference between scores estimated on donations made during the primary and scores estimated on donations made during the general election. District covariates include: percent Black, unemployment, percent college-educated, median income, Democratic presidential vote, and population density.

7.1 Citizens United

Finally, because the time period we study includes a Supreme Court decision with important impacts on the regulation of campaign finance—*Citizens United v. Federal Election Commission*—we have included a preliminary set of analyses probing the effects of that decision on donation-based measurements of candidate ideology. The first of these analyses are included in Table 4. This table includes two regressions—one fit on the data from the pre-Citizens United years (2002-2008), and one fit on the data from the post-Citizens United years (2010-2018). These analyses show that the incumbency effects found in the previous section are largely driven by the election years after the Citizens United decision. Additionally, the size of the primary election candidate pool exerts a larger effect on ideological scores changes in the pre-Citizens United period.

Table 4: Effect of Candidate Type on Primary to General Shift – Before and After Citizens United

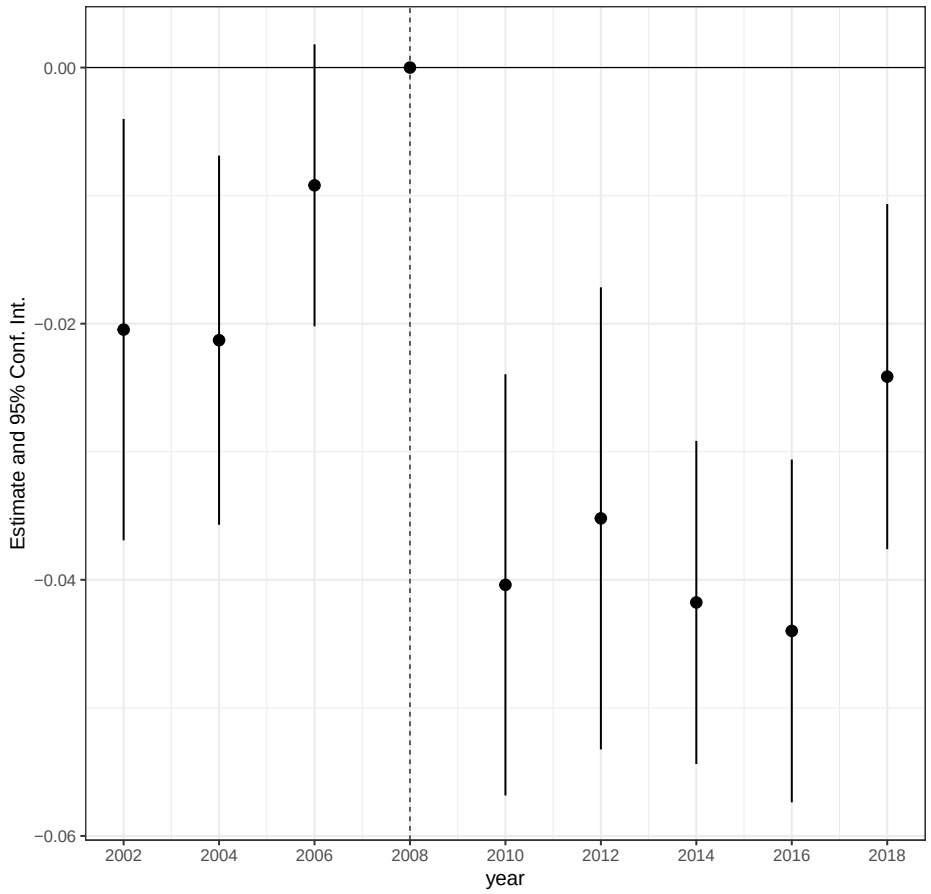
	Dependent variable:	
	|Primary - General Score|	
	Pre-Citizens United	Post-Citizens United
Incumbent	−0.040+	−0.078***
	(0.024)	(0.020)
Num. Candidates in Primary	0.031***	0.010*
	(0.005)	(0.004)
Num. Unique Primary Donors (Logged)	0.045+	0.001
	(0.023)	(0.020)
Total Primary Receipts (Logged)	−0.052*	−0.004
	(0.021)	(0.022)
Num.Obs.	2913	2764
R2 Adj.	0.532	0.615
R2 Within Adj.	0.065	0.048
Std.Errors	by: bonica.rid	by: bonica.rid
FE: bonica.rid	X	X
FE: cycle	X	X
District Covariates	X	X

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Both models are linear regression models with fixed effects for candidate and cycle. We cluster standard errors on at the candidate level. Our dependent variable is the absolute value of the difference between scores estimated on donations made during the primary and scores estimated on donations made during the general election. District covariates include: percent Black, unemployment, percent college-educated, median income, Democratic presidential vote, and population density.

The finding that incumbent candidates' ideological scores are more stable across electoral contexts compared to non-incumbent candidates constitutes an important takeaway from this work. However, the models presented in Table 4 provide suggestive evidence that this finding is driven by the latter years of our data—after an important legal change in how campaign contributions are regulated. Figure 8 delves more deeply into that possibility. This event study plot shows how the effect of incumbency on primary-to-general ideological score changes varies by year—compared to a baseline of 2008, the last election prior to the Citizens United decision. This plot reaffirms the results presented in Table 4. The magnitude of the incumbency effect is considerably larger—and always statistically significant—in the post-Citizens United elections. A major contention of this paper is that scholars should take the data-generating process for campaign donations into account when constructing donation-based ideological scores. While most of the analyses in this paper focus on the differences in data-generating processes from the primary election to the general election, it is also important to consider how these processes may change from one election year to the next, or from one legal regime (pre-Citizens United) to another (post-Citizens United). The analyses presented in this subsection are preliminary, but they will be further fleshed out in future iterations of this paper.

Figure 8: Event Study Plot on Incumbency Over Time



Note: Y-axis shows the coefficient and 95% CI on the interaction between incumbency and election cycle, with 2008 being the reference point (because Citizens United v FEC occurred at the very start of 2010). Covariates are the same as they were for regressions from Table 4.

8 Conclusion

In this paper, we have provided a critical analysis of campaign finance based ideological measures. While our analyses are ongoing, we uncover a number of systematic trends in the dynamics of CFscores throughout the campaign cycle. First, there is considerable within-candidate variation in scores from the primary to the general election. While we still need to see if these differences are robust to a number of different bridging techniques, we expect that they will be given the significant overlap between candidates and donors in each stage.

While considerable cross-period variation exists, it is promising from a measurement standpoint that at

least some component of that variation seems to be systematically related to observable features of candidates and election contexts. Based on the systematic nature of these differences, it may be possible to develop methods intended to correct for bias found in existing scores. Moving forward, we need to further explore the partisan dynamics evident in stability and change in measured ideology throughout the campaign cycle. There is no theoretical reason—at least in the theoretical framework we have laid out—to expect these trends to be partisan in nature. Further work can be done on both the theoretical and empirical side to help explain the differences we observe here.

Further analysis could also focus on *directional* changes in ideological scores from the primary election to the general election, rather than absolute differences. However, we are agnostic about the application of the approach we have laid out here to questions about the moderation hypothesis or other questions about campaign strategy and rhetoric. Before seeking to answer these kinds of questions based on period-specific fluctuations in candidate ideology scores, scholars should first establish whether they conceptualize ideology through a reflective or a formative theory of measurement. Are candidates actually changing their ideology as they move from the primary to the general election, as might be suggested by a formative measurement model? Or is candidate ideology remaining constant while changes in the salience of ideological proximity as a consideration in the donation decision distort the connection between ideology and political giving? Establishing firm and explicit theoretical positions on these questions can help guide empirical work moving forward, and can helpfully contextualize the use of campaign finance based ideological scores to address a number of substantive questions in political science.

In addition to providing a basis for the potential construction of "corrected" scores in the future, or articulating a justification for the use of "period-specific" scores, our work in this paper can also provide guidance to other scholars in thinking about appropriate uses for Bonica's CFscores. One of the major value-added components of Bonica's scores is that they place campaign donors as well as successful and unsuccessful candidates at the local, state, and federal level on a common ideological scale. However, our analyses here, which demonstrate that campaign finance based ideological scores are sensitive to the specific time period in which they are measured, raise potential issues with making comparisons between winning and losing candidates.

If time matters in the measurement of ideology, researchers need to grapple with the implications of the fact that not all candidates get the same amount of time to campaign. Should we think of the ideological score of a candidate who lost in the primary as directly comparable to the score of a candidate who went on to win the general election? If we know that scores fluctuate throughout the campaign cycle, it's not clear that we can. However, given the greater temporal stability of campaign finance based ideological scores for incumbents, the use of Bonica's scores as alternatives to NOMINATE measures in studies of Congress

constitute less problematic applications. As with the use of any measure, researchers need to think carefully about the conceptual and theoretical fit between their research question and the ideological measures they use.

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