Selling Representation: The Effect of Out-of-District Donations on Candidate Positioning

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March 26, 2026

Abstract

The United States House of Representatives is intended to be the locally representative body of federal government. While only district residents are eligible to vote, residents of the entire country can donate to any candidate. This paper explores how much the pursuit of money from ideologically extreme donors explains candidates' deviations from representing their constituents. I estimate a structural model of a candidate's ideology choice in which candidates care about winning, which tends to pull them to the ideological center, and fundraising, which tends to pull them to the ideological extremes. A prohibition on out-of-district giving achieves a third of the reduction in polarization that would arise if candidates' positions maximized win probability alone.

Keywords: polarization, candidate ideology, out-of-district donations, campaign finance, gerrymandering

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1 Introduction

The United States House of Representatives was created to be the locally representative body of federal government. In keeping with the Founding Fathers' intent that the House "have an immediate dependence on and intimate sympathy with the people," its members represent small districts and face reelection every two years.[1] While only district residents are eligible to vote in U.S. House elections, there are no place-based restrictions on donating, and out-of-district giving has been increasing over time. Between 1990 and 2010, only a quarter of individual donations crossed state lines; in 2020, by contrast, half of individual donations did. Voters and donors differ not only in the nature of their allowable participation, but also in their political preferences: Donors are more ideologically extreme (Bafumi and Herron, 2010). As a result, out-of-district giving may present candidates with incentives to adopt more extreme ideological positions than their voters, potentially explaining recent record-high congressional polarization.[2]

Based on roll call voting, there has been no ideological overlap between parties in Congress since 2002, and the ideological gap between parties continues to grow.[3] Scholars and observers worry about the threat of polarization to U.S. democracy.[4] Polarized Congresses are less likely to pass legislation on important issues (Binder, 1999; McCarty, 2007), and polarization undermines popular faith in government. A 2023 Pew survey found Americans are less likely to express positive views about their government than ever before with "divisive" being the most common response to the open-ended question: "What one word or phrase would you use to describe politics in the U.S. these days?".[5] A large literature has explored the causes of political polarization, including primary voters (Hirano et al., 2010; Kujala, 2020; McGhee et al., 2014), gerrymandering (McCarty et al., 2009), social media (Gentzkow and Shapiro, 2011; Guess, 2021), party control (Canen et al., 2020), and campaign finance (Bonica, 2013; Barber, 2016a; Canes-Wrone and Miller, 2022). Despite much research progress, the puzzle of record-high levels of congressional polarization remains.

In this paper, I measure the effect of out-of-district donations on candidate ideological positioning. Before estimating a structural model of candidate positioning, I provide evidence that a candidate's ideology choice affects the votes and donations she receives. Motivated by this evidence, I build an equilibrium model of the supply of and demand for candidate ideology. The model allows

[1] https://www.house.gov/the-house-explained/history-of-the-house

[2] https://www.pewresearch.org/short-reads/2022/03/10/the-polarization-in-todays-congress-has-roots-that-go-back-decades/

[3] Based on author calculations from data described in section 3.

[4] https://www.brookings.edu/articles/reducing-extreme-polarization-is-key-to-stabilizing-democracy/

[5] See: https://www.pewresearch.org/politics/2023/09/19/americans-dismal-views-of-the-nations-politics/

for measurement of the effect of out-of-district giving on candidate positioning. In the model, candidates are responsive to donor preferences because candidates' chosen ideologies maximize a weighted sum of win probability *and* fundraising. The key intuition of the model is that a candidate's choice of ideology trades off direct reductions in vote share against gains in donations.

Implementing this approach requires separate models of voter and donor demand as functions of candidate ideology. I estimate a discrete choice voting model using individual-level survey data of ideology and vote choice from the Cooperative Election Study (CES). Individuals vote to maximize their utility, which depends on their ideology, candidate ideology, candidate spending, and candidate vertical quality. Individuals are more likely to vote for candidates who have ideologies similar to their own and larger campaign funds. The model allows for calculation of the vote share that each candidate stands to gain for a small change in her ideology. The estimates imply that the median candidate could gain 59 votes by becoming 1% more moderate.

I model individual donation choice with a discrete choice approach using donation data from the Federal Election Commission. Unlike voters, donors can choose among candidates in 435 districts. Donors give to the candidate that maximizes their utility, which depends on their ideology, candidate ideology, whether the candidate is local, how competitive the candidate's election is, and candidate vertical quality. Donors — who tend to be extreme — prefer ideologically- and geographically-proximate candidates and those who stand for election in competitive districts. The model predicts how much money each candidate stands to gain for a small change in her ideology. The estimates imply that the median candidate would gain $1,000 for becoming 1% more extreme.

I close the model with the candidate's (supply-side) general election ideology choice. In each district's general election, the Democrat and Republican candidates simultaneously choose ideologies to maximize a weighted sum of win probability, fundraising, and hewing to their ideological ideal points, the ideology they would choose absent concerns about general election winning or fundraising. The Nash Equilibrium to this game is represented by a vector of candidate first order conditions that relate observed ideologies to three demand-side derivatives with respect to ideology: the win probability gain (loss), the direct fundraising gain (loss), and the indirect effect of fundraising on win probability. I estimate the weights candidates place on fundraising and on staying close to their preferred ideologies relative to win probability maximization — i.e. the weights that best rationalize the observed equilibrium. I estimate that candidates value winning, informed by the correlation between win probability gains from moderating and the tendency to have a moderate position. Candidates also value fundraising: those with the most money to gain by being extreme

have the most extreme positions.

The model allows for exploration of counterfactuals to quantify the extent to which out-of-district giving affects candidate positioning. First, I consider how candidates' ideology choices would change if out-of-district donating were prohibited. Disconnected from ideologically-extreme, non-voting constituencies, candidates choose more moderate positions, on average. Candidates choose positions closer to their district's median voters, and the ideological distance between the median Democrat and Republican in the 2018 Congress decreases by 2%.

A prohibition on out-of-district giving, however, has unsavory consequences for political participation: Ninety percent of Americans live in lopsided congressional districts and prohibiting out-of-district giving silences an important form of their political participation. In a second counterfactual, I explore what would happen to candidate positions if districts were drawn to reflect state-wide preferences approximating districts drawn without gerrymandering. On the voter side, this makes districts more competitive, giving candidates more reason to moderate to win their general election. The paper considers a second channel too, that operates through the donor side. As donors live in more competitive districts, they endogenously reduce their out-of-district giving in favor of within-district giving. Districts drawn to reflect statewide preferences reduce the ideological distance between the median candidates of each party by 2.8%. The novel channel this paper highlights is that the endogenous reduction in out-of-district giving alone leads to a polarization reduction of 1.25%, around half of the depolarizing effect of an all-out ban on out-of-district gifts.

The paper proceeds as follows. Section 2 provides institutional background and reviews related literature. In Section 3, I introduce the data sources and present some data patterns. I present evidence that candidates face a trade-off between appealing to voters and donors in Section 4. The model is in Section 5, and the estimation is in Section 6. Counterfactuals are in Section 7. I conclude in Section 8.

2 Background and Literature

2.1 Locally-Representative House of Representatives

The 435 members of the House of Representatives represent small districts of roughly equal population (around 760,000) and stand for reelection every two years. The Founding Fathers intended for the House to be the most locally representative body of federal government. The House was

meant to have "an immediate dependence on, and intimate sympathy with, the people."[6] Districts were designed to be independent political communities, each voting for representatives that reflected local preferences. As a result, House members would be attuned to their local constituents rather than national issues.[7] When the Founding Fathers were writing in 1787, "information traveled no farther than the horses and boats that carried it," and, as a consequence, "political loyalties would wane over great distances" (Hopkins, 2018).

2.2 National Donor Pool in the United States

While only a district's residents are eligible to vote for candidates in that district's election, there are no geographic restrictions on giving by U.S. citizens. Individual donors represent an important source of candidate funds: Approximately 60% of candidate fundraising comes from individual donors who can donate up to $\$3,300$ to a candidate per election.[8]

There is some policy discussion surrounding whether only a jurisdiction's eligible voters should be allowed to contribute money. Former Supreme Court Justice John Paul Stevens recommended six changes to the Constitution, among them a prohibition on out-of-district giving (Stevens, 2014).[9] Some policies reflect this negative view about cross-district giving. Federal campaign finance law recognizes the potentially corrupting influence of individuals who lack voting rights in the jurisdiction. In United States federal elections, foreign nationals are prohibited from contributing to candidates in U.S. federal elections.[10] While there is no federal prohibition on out-of-district giving, some states (Oregon, Alaska, and Hawaii) have, or have proposed, laws limiting out-of-state or out-of-district giving to state legislators (Fontana, 2016). Finally, New York City has a matching program for donations to candidates that originate from constituents.[11]

[6] Madison, James, Federalist No. 52: "The House of Representatives."

[7] Madison, James, Federalist No. 10: "The Same Subject Continued: The Union as a Safeguard Against Domestic Faction and Insurrection."

[8] The contribution limits are indexed to inflation and change most years. See: https://www.fec.gov/help-candidates-and-committees/candidate-taking-receipts/archived-contribution-limits/

[9] "I shall explain why it is unwise to allow persons who are not qualified to vote-whether they be corporations or nonresident individuals-to have a potentially greater power to affect the outcome of elections than eligible voters have (Stevens, 2014)."

[10] "[T]he United States has a compelling interest... in limiting the participation of foreign citizens in activities of American democratic self-government, and in thereby preventing foreign influence over the U.S. political process." See: https://www.fec.gov/legal-resources/court-cases/bluman-v-fec/

[11] See https://pcfb.ny.gov/program-overview

2.3 Literature

This paper extends the literature on the determinants of candidate ideology and polarization by estimating a structural model of the market for candidate ideology and out-of-district donors.

Many papers explore the determinants of candidate ideology by estimating the implicit weight that candidates place on various constituencies.[12] Of particular relevance to the current study are the papers that estimate the weights candidates place on ideologically-extreme donors (Barber, 2016b; Canes-Wrone and Miller, 2022; Waldfogel, 2024).[13] Using state-level policy variation in individual contribution limits, Barber (2016a) finds that higher individual contribution limits lead to more polarized state legislatures. Canes-Wrone and Miller (2022) show that federal House candidates are more likely to vote with national donor preferences when redistricted to electorally safer, or less competitive, districts. Waldfogel (2024) shows that candidates recognize and respond to the tension presented by their electorate and donorate having different preferences. Candidates portray themselves as more moderate in their voter-targeted ads relative to donor-targeted ads. These papers establish evidence that individual donors polarize candidates. Relative to these papers, this paper's structural model allows for quantification of the effect of out-of-district donors on polarization.[14]

This paper adds to the literature on political donor behavior by estimating a structural model of donor choice that harnesses within-candidate identification.[15] Much of the existing literature on the link between candidate ideology and fundraising shows that ideologically extreme candidates receive more donations from individuals (Ensley, 2009; Bouton et al., 2021). Relative to existing approaches, the empirical approach in this paper allows for identification of the effect of a candidate's *ideology* on her fundraising — separate from her other characteristics. This paper's use of within-candidate identification to estimate donor aversion to ideological distance is similar to the approach in (Barber et al., 2017). Relative to existing papers, this paper estimates a structural model of donor choice, which allows for counterfactual policy experiments. The donor choice model casts candidates as differentiated in horizontal ideology space and vertical quality space, making it similar to the model

[12] Examples of relevant constituencies are voters (Jones and Walsh, 2018; Bafumi and Herron, 2010; Mian et al., 2010; Balles et al., 2018), primary constituents (Kujala, 2020), donors (Canes-Wrone and Miller, 2022; Barber, 2016b; Waldfogel, 2024), interest groups (Grossman, 1994) or a candidate's own privately-held ideology (Levitt, 1996; Washington, 2008).

[13] A large literature in political science and economics explores a variety of causes of political polarization, including primary voters (Hirano et al., 2010; Kujala, 2020; McGhee et al., 2014), gerrymandering (McCarty et al., 2009), media (Snyder Jr and Strömberg, 2010), social media (Gentzkow and Shapiro, 2011; Guess, 2021), PACs (Bonica, 2013), etc.

[14] The model is similar to approaches in Iaryczower et al. (2022) and Cox (2022).

[15] A vast literature studies donor characteristics and behavior (Grenzke, 1988; Francia et al., 2003; Gimpel et al., 2008; Barber et al., 2017; Bouton et al., 2021).

of voter choice in Iaryczower et al. (2022).[16]

The model treats ideological positioning as a form of spatial differentiation, analogous to firms' product location choices in industrial organization models. This paper's model builds on the literature on oligopoly markets with spatial differentiation. In the empirical literature, the estimation approach builds on insights from Fan (2013) by exploiting the fact that candidate locations are continuous (see also Goettler and Shachar (2001) in the context of TV programming and Seim (2006) and Mazzeo (2002) in the context of discrete games with product differentiation). The key difference is that the payoff of candidates is generated by the interaction of two markets: voter and donor. The literature on competition in two-sided markets has for the most part focused on pricing strategies (Rysman, 2004), and a contribution of this paper is to consider non-price strategies in two-sided markets.

3 Data and Data Patterns

3.1 Data

This paper estimates three models, each requiring distinct information. First, estimating a model of voter choice requires information on voters' ideologies and vote choices, as well as candidate options. Second, estimating a model of donor choice requires information on donors (their ideologies and locations) and donation choices. Third, estimating a model of candidate position requires a data set of candidate characteristics matched with model outputs of win probability and fundraising incentives. To this end, I construct three data sets (voter, donor, and candidate) from three underlying sources: the Cooperative Election Study survey (CES), the Federal Election Commission (FEC), and Bonica's DIME data, which I describe next.

3.1.1 Individuals: Cooperative Election Study Survey

From the Cooperative Election Study (CES), I observe the ideological distribution and political behavior of individuals at the congressional district level from 2010 to 2020. The CES is a nationally representative annual survey of around 60,000 United States residents that asks about political behavior, political attitudes, and demographics. I observe individual ideology, vote choice, and donating behavior as well as individual perceptions of candidates' ideologies. I also observe whether

[16]Earlier work that estimated discrete choice models of vote choice focused on the effect of advertising on vote shares (Rekkas, 2007; Gordon and Hartmann, 2013).

an individual gave to any in-state or out-of-state House candidate.

As a measure of individual ideology, I use the self-reported measure from the CES. Self-reported ideology is measured on a seven-point scale where one is "Very liberal" and seven is "Very conservative." A value of four represents a "Middle of the road" ideology. Average self-reported ideologies aggregated to the district level are highly correlated with the district's Republican presidential vote share (shown in the top panel of Figure 2), suggesting that self-reported ideology captures decision-relevant individual characteristics.

To study individual vote choice, I use a combination individuals' self-reported vote choices and validated vote records for House elections in the survey.[17] If a person reports voting for the Republican (Democrat) House candidate *and* has a validated record of voting in the general election, I consider her choice the Republican (Democrat) candidate. If an individual has no validated record of voting in the general or she reports abstaining from voting, I consider her choice to have been the outside option of not voting.

Survey vote shares imply higher turn out rates than reality. In estimating the voting model, I match the model predicted vote shares to *actual* aggregate candidate vote shares (collected from MIT Election Lab) rather than the candidate vote shares implied by the survey data.

3.1.2 Donations: Federal Election Commission

From the Federal Election Commission (FEC), I observe all reported (above $200) individual donations to federal candidates between 1990 and 2020. An observation in the data is an individual's donation, her residence, amount donated, date of donation, and candidate recipient. In addition to individual donations, I observe the total amount each candidate raises from all sources: individuals (separately by itemized and unitemized), party committees, PACs, other candidates, and independent expenditures spent by PACs and SuperPACS on behalf of candidates.[18]

3.1.3 Candidates: Ideology

I observe a one-dimensional measure of House candidate ideology using Bonica's cfscores (Bonica, 2014), which is commonly-used in political science and political economy.[19] The ideology measure

[17] In all surveys between 2010 and 2020, I observe individuals' self-reported vote choice. For surveys in 2010, 2014, 2016, and 2018, I observe validated vote records.

[18] Itemized individual donations are the aggregate sum of all individual donations above $200, while unitemized individual donations are the aggregate sum of all individual donations below $200. I also observe the amount spent via independent expenditures on each candidate's behalf.

[19] See, for example, Fowler et al. (2023); Autor et al. (2020).

is based on a spatial model of ideological donors and exists for all candidates who run for office. Roll call scores, by contrast, only exist for candidates who are elected to the House. The correlation between cfscores and roll call scores, which are based on a spatial model of voting in Congress, is shown in the bottom panel of Figure 2. A candidate's roll call score is calculated based on how she votes on bills in the House of Representatives.[20]

I construct an additional measure of House candidate ideology using survey respondent perceptions from the Cooperative Election Study, which I use in several robustness checks (Ramey, 2016). CES survey respondents rate their district's House candidates on the same seven-point ideological scale as described in Section 3.1.1. I calculate a candidate's ideology by taking the average over her constituents' responses. On average, a candidate is rated by 70 resident survey respondents.

Within-candidate changes in ideology (as measured by cfscore or CES responses) are uncorrelated with within-candidate changes in roll call scores, which I take as evidence that within-candidate variation in cfscore (and CES) ideology is noisy. Thus, I calculate a candidate's time-invariant ideology by calculating her average ideology across years.

The analyses that follow require that individual and candidate ideologies be measured on the same scale. The main candidate ideology measure, cfscore, ranges from -2.04 to 2.63, where Democrats have lower ideology (or negative) ideology values and Republicans have higher (or positive) ideology values. I rescale individual ideologies that range from 1 to 7 from the CES such that they range from -2.63 to 2.63. The distribution of candidate ideologies, as well as average district-party individuals' ideologies, are plotted in Figure 3. The plot on the left shows the ideological distribution of candidates and district-parties as measured using the one to seven CES scale. The distribution of origin average ideologies for Republicans voters tends to be more extreme than that of Republican candidates. The plot on the right shows the same information as measured using candidate cfscores and (rescaled) CES district-party ideology. It is reassuring that origin-party ideologies, rescaled to the cfscore scale, retain the general patterns shown on the CES distributions. For example, candidate and average district-party constituent ideologies are bimodal, and the distribution of Republican origin average ideologies is more extreme than that of Republican candidates.

[20] See Poole (2005) for more information regarding how roll call votes are constructed.

3.1.4 Additional Sources

I collect additional congressional district and election characteristics. I observe congressional district-level presidential vote shares from Polidata, which I use as measures of district partisanship (Polidata, 2022). I observe 2018 House race polls from FiveThirtyEight and House race results from MIT Election Lab for the entire sample period (MIT Election Data and Science Lab, 2020). I observe the geographic distance between districts using Census Gazetteer files. Finally, I collect county-by-county level Social Connectedness from Facebook's Social Connectedness Index (Bailey et al., 2018).

3.2 Data Patterns

In this section, I present four facts about donors and one about polarization. First, individual donors comprise the largest and most dependable source of campaign funds. Second, relative to other sources of campaign funds, individual donors reward extremeness. Third, individuals give the majority of their donations out of district. Fourth, donors are extreme. Fifth, and finally, candidates are more extreme than their primary voters.

3.2.1 Individual Givers

Donations from individuals comprise a significant portion of all House candidate funding. Between 2012 and 2020, the average general election House candidate received 60% of her total funding from individual donors. Even after accounting for independent expenditures made by PACs and Super PACs on behalf of candidates, donations from individuals comprise half of House candidate funding. Figure 4 depicts the proportion of overall House candidate funds supplied by various sources: individuals, PACS, independent expenditures, candidates, and party committees. Moreover, candidates can expect to receive donations from individuals: Approximately all candidates receive donations from individual donors, whereas only around one-third of candidates have any independent expenditures spent on their behalf, shown in Figure 5.

In addition to comprising the largest single source of House candidate funds, individual donors are ideologically-motivated givers. Table 1 reports results from regressions of candidate funding on candidate ideological extremeness (measured as the absolute value of candidate cfscore) for the five main sources of candidate funding: individual donors, PACs, party committees, independent expenditures, and other candidates. The first row of Table 1 shows the coefficient estimate on

candidate ideological extremeness for the various funding sources. The coefficient in Column (1) is large, positive, and statistically significant, indicating that more extreme candidates attract more donations from individuals. The coefficient estimates for PACs, parties, independent expenditures, and other candidates are either negative or statistically indistinguishable from zero, suggesting these funding sources do not reward extreme candidates, as individual donors do.[21]

3.2.2 Donor Pool Increasingly National

While only a candidate's constituents are eligible to vote in their elections, there are no place-based restrictions on giving. Figure 6 depicts the increasingly nationalized donor pool between 1990 and 2020 by plotting all individual donations to House candidates in one election per decade (election years 1990, 2000, 2010, and 2020). The horizontal axis lists origin congressional districts (where donors reside) sorted in alphabetical order by state. The vertical axis is a mirror image, listing destination congressional districts (where candidates stand for election) sorted by state. A black square on the grid indicates that at least one donation to candidates in the destination district on the y-axis came from the origin district on the x-axis. Within-district donating is depicted along the diagonal, and within-state giving is shown in the blocks along the diagonal. In 1990, around 50% of donations crossed district lines. By 2020, 75% of donations crossed district lines, representing a 50% increase. Out-of-state giving doubled during the same time period.

3.2.3 Donors are Extreme

One reason why individual donors may reward extreme candidates is because they are themselves extreme. Political donors are an ideologically extreme subset of the population (Bafumi and Herron, 2010; Francia et al., 2003). This stylized fact is reflected in the CES survey data, shown in Figure 7. While a quarter of the population identifies as "Middle of the road" ideologically, only 13% of donors identify as such (Fowler et al., 2023). Instead of clustering around the middle, the probability distribution of donor ideology is shifted to the ideological tails. While 23.5% of individuals consider themselves "Liberal" or "Very Liberal", 35.5% of donors self-identify as such. 31.8% of donors consider themselves "Conservative" or "Very Conservative" compared to 29% of the population.

[21] I repeat the analysis using candidate ideology as measured in the CES (survey data perception of candidate ideology), and the results are shown in Table A1. Using this measure, individual donors remain the most ideological source of candidate funds. Candidate extremeness is calculated as the absolute value of the difference between candidate ideology and 4, the "middle of the road" ideology.

3.2.4 Congressional Candidate Polarization Exceeds that of Primary Voters

Congressional polarization has risen over the past decade (McCarty, 2019), and patterns in the data suggest that primary voter preferences alone cannot explain candidate moves to the extreme. If candidate polarization could be explained by polarizing primary constituents, then increases in candidate extremeness would track increases in primary constituent extremeness. By contrast, if candidates were becoming more extreme than their primary constituents, we would expect a positive time trend coefficient to explain candidate extremeness over and above the relationship between candidate and primary voter extremeness.

Results from regressions exploring this relationship are reported in Table 2. The first row in Column (1) indicates that average primary voter ideologies are correlated with candidate ideology. The coefficients in the second and third rows indicate that, over time, Democratic (Republican) candidates are more extreme, as evidenced by the negative (positive) sign of the coefficient on the time trend. Column (2) shows the results using only within district-party identifying variation. Column (3) pools the estimate across parties by transforming the ideology variables to be ideological extremeness (distance from 0). Throughout all specifications, the coefficient on the time trend is positive and significant: Conditional on primary preferences, candidates are more extreme in 2020 relative to 2012. The coefficient's magnitude suggests that a candidate in 2020 — representing identically extreme primary constituents as a candidate in 2012 — would have an ideology that is a third of a standard deviation more extreme. These results echo findings in the literature that find limited evidence that primary elections are an important contributor to polarization (McCarty, 2019; Hirano and Snyder Jr, 2019).[22]

4 Candidates Face a Tradeoff Between Appealing to Voters and Donors

Before introducing the model, I provide evidence that voters' and donors' choices depend on candidate ideology. Both groups prefer candidates who are ideologically similar to themselves.

[22] A sample of this evidence is as follows. Primary and general election voters from the same party are ideologically similar (Sides et al., 2020). Extreme primary candidates do not fare much better in primaries than their less extreme counterparts (Hirano et al., 2010). This could be in part because primary voters prefer candidates who will do well in the general election, and more extreme candidates fare worse in general elections (Hall and Thompson, 2018). And over half of primary nominees are *more* extreme than their partisan constituencies, suggesting they have overshot if they were only concerned with appealing to their primary constituents (Kujala, 2020).

4.1 Voter Preference for Ideological Distance

I explore the relationship between individual voting and ideological distance to candidates by regressing an individual's decision to vote in her district's congressional election on the squared ideological distance to her party-affiliated candidate. The relationship between candidate and voter ideological proximity and vote-getting has been explored both in the aggregate (Canes-Wrone et al., 2002; Hall and Thompson, 2018) and at the individual level (Tausanovitch and Warshaw, 2018). Relative to the literature, the results reported here come from a specification with candidate fixed effects using data from 2012-2020. Identification of ideological distance's effect on voting comes from within-candidate, across-individual variation, alleviating bias arising if a candidate's ability to attract votes is correlated with her distance to voters. Results are presented in Table 3.

Column (1) shows that as the squared ideological distance to a candidate increases, people are less likely to vote for that candidate. This coefficient may be attenuated because ideologically extreme individuals are more likely to vote and are (mechanically) ideologically further from their candidate. Column (2) includes a control for the individual's ideological extremeness (measured as the absolute value of her ideology from 4, or, "Middle of the Road"), which strengthens the relationship between ideological distance and vote choice. The results in Table 3 warrant a within-candidate interpretation: Candidates can increase their vote share by choosing an ideology closer to that of their voters.

4.2 Donor Preference for Ideological Distance

Ideologically extreme candidates receive more donations from individuals (see Table 1), and this pattern could arise because candidates are rewarded for being ideologically extreme. On the other hand, it could be that ideologically extreme candidates possess other unobservable qualities that make them effective fundraisers. In the analysis that follows, I can tease out the effect of candidate ideology itself — separate from unobservables correlated with candidate ideology — by using an empirical strategy that relies on within-candidate variation.

I explore the relationship between the ideological distance between a donor and candidate and giving to that candidate using a five election cycle (2012-2020) panel of origin district-party by candidate donation amounts matched with average origin district-party ideologies and recipient candidate ideology. The donation data are from the Federal Election Commission. Candidate ideologies are measured using cfscores. Origin-party district ideologies are calculated as the average

self-reported ideology of party-affiliated constituents from the CES survey and are rescaled to be on the same scale as candidate ideologies.

Table 1 presents two specifications to explore the relationship between an origin district-by-party's tendency to give to a candidate and the squared ideological distance between the origin and candidate. In the first specification, the coefficient on squared ideological distance is identified using across candidate variation within the candidate's district party. In other words, identification relies on changes in the destination district party's candidate. The result in Column (1) of Table 1 indicates that individual donors prefer ideologically close candidates. However, as mentioned previously, it could be that a candidate's unobservable ability to fundraise is correlated with her ideological distance to an origin-party. To ensure that across candidate comparisons do not drive the result, the specification in Column (2) includes candidate-by-election cycle fixed effects. Identification of the preference for ideological distance arises from within-candidate comparisons across origins. The coefficient on squared ideological distance remains negative and statistically significant. Results in Column (2) warrant a within-candidate interpretation: A candidate could increase her fundraising by moving closer to the ideological position of donors. Table A2 shows that the results are similar when measuring squared ideological distance using the CES ideology measures for candidates.

5 Model

Next, I lay out the model, which is informed by the preceding data patterns and motivated by evidence that candidates adopt extreme ideologies to raise more from individual donors (Canes-Wrone and Miller, 2022; Barber, 2016a; Waldfogel, 2024). The model is necessary for estimating the counterfactuals of interest. The first part of the model — the supply side — explains how candidates choose their ideologies to appeal to ideologically-distinct donors and voters. The second part discusses two distinct demand-sides: how voters choose for whom to vote and how donors choose to whom to give. I conclude the section with a description of the model's equilibrium.

5.1 Candidate

The timing of the game is as follows. First, candidates in every district are endowed with $\bar{y}_j$, the ideology they would choose absent general election win probability incentives and fundraising incentives. $\bar{y}$ is commonly observed by all candidates in all districts. One can think of $\bar{y}_j$ as a candidate's innate ideology, which I proxy using the average ideology of her same-party district residents. Given

this, each candidate simultaneously chooses her general election ideology, y_j, to maximize the objective in equation 1. As the model's main function is to capture candidate position as a function of out-of-district donations, I abstract away from an explicit model of the primary elections. Seventy percent of individuals' out-of-district donations occur either during the general election months or during an uncontested primary, which suggests that counterfactually changing out-of-district donation conditions will have a limited effect on primary elections. Moreover, candidates change their position between the primary and general (Di Tella et al., 2023); the model's choice is the general election position.[23]

Next, donors observe candidate ideologies and donate, which gives rise to a candidate's fundraising, M_j. Then, voters in each district observe their districts' candidates' ideologies and fundraising and vote for their utility-maximizing candidate. Votes get translated into a win probability, π, which includes noise such that π is a smooth function of vote shares, s.

The candidate objective is written as follows:

$$\max_{y_j} \quad \pi(y_j, y_{-j}, M_j, M_{-j}) + \lambda_1 M_j(\mathbf{y}) - \lambda_2 (y_j - \bar{y}_j)^2 \tag{1}$$

First, candidates want to maximize their general election win probability (Downs, 1957; Jones and Walsh, 2018). A candidate's win probability depends on her ideology choice, y_j, and fundraising, M_j, as well as her district rival candidate's ideology choice, y_{-j}, and his fundraising, $M(y_{-j})$. Second, candidates want to maximize the amount of money they raise for reasons beyond its effect on win probability (as in Grossman (1994)). Conditional on winning election to the House, fundraising is a large part of the job; being a successful fundraiser helps candidates get better House committee assignments, as well as future legislative favors (Powell, 2013; Canes-Wrone and Miller, 2022). Regardless of the election's outcome, fundraising may be useful: Candidates can signal their future career prospects or donate to like-minded candidates to advance their political agenda (Fontana, 2016). A candidate's fundraising depends on the ideologies of same-party candidates in all districts. Finally, candidates prefer staying close to a bliss point, the ideology they would choose absent general election win probability or fundraising concerns (Levitt, 1996). λ_1 and λ_2 are the weights — to be estimated — that candidates place on fundraising and staying close to their ideal point.

A candidate's first order condition relates her ideology choice to three demand-side derivatives and her unobserved ideal point (see equation 2). The first right-hand side term is the derivative

[23] More generally, candidates' platforms are context dependent.

of a candidate's win probability with respect to her ideology choice. The term includes the direct effect of ideology on win probability as well as the indirect effect operating through fundraising. The second term is the derivative of a candidate's fundraising with respect to her ideology choice.

$$y_j = \frac{1}{2\lambda_2}\left(\frac{\partial \pi(y_j, y_{-j})}{\partial y_j} + \frac{\partial \pi(y_j, y_{-j})}{\partial M(y_j)}\frac{\partial M(y_j)}{\partial y_j}\right) + \frac{\lambda_1}{2\lambda_2}\left(\frac{\partial M(y_j)}{\partial y_j}\right) + \bar{y}_j \tag{2}$$

Calculating these demand-side derivatives requires models of how individuals choose whom to vote for and donate to, which I describe next.

5.2 Voter

5.2.1 Individual Vote Choice

There are 435 congressional districts in the United States, each containing around 760,000 individuals. House general elections are held in November of every even-numbered year. Individuals are eligible to vote in the election happening in their district and can vote for a House candidate in their district's general election or abstain from voting, $j \in \{D, R, 0\}$.[24] I model the utility individual i receives from voting for candidate j in year t as:

$$u^v_{ijt} = \beta_1(y_j - y^v_{it})^2 + \beta_2|y^v_{it}| + \beta_3 \mathbb{1}\{\text{same party}\}_{ijt} + \delta^v_{jt} + \epsilon^v_{ijt} \tag{3}$$

where y_j is candidate j's time-invariant ideology, y^v_{it} is individual i's ideology, $|y^v_{it}|$ is individual i's ideological extremeness, $\mathbb{1}\{\text{same party}\}_{ijt}$ is an indicator variable equal to 1 if individual i and candidate j are from the same party, δ^v_{jt} is candidate j's mean utility in year t, and ϵ^v_{ijt} is an idiosyncratic, unobservable component of utility. β_3 allows for individuals from different parties to disagree about candidate j's vertical quality. ϵ^v_{ijt} are assumed to be type 1 extreme value. Utility for choosing the outside good (abstaining from voting) is given by:

$$u^v_{i0t} = \epsilon^v_{i0t}$$

I parametrize candidate mean utility, δ^v_{jt}, to include the total amount of fundraising candidate j receives in year t, M^{total}_{jt}, and a candidate unobservable vertical quality component, μ^v_j, which is

[24] In all congressional districts besides those in Louisiana, a maximum of two candidates compete in the general election, one from each main party (Democrat or Republican). Exceptions to this are in California and Washington, where the top two primary candidates, regardless of party, advance to the general. In the estimation sample, I keep district-years in which a Democrat and Republican compete against one another. I treat voting for a third-party candidate as choosing the outside option (abstaining).

time-invariant.

$$\delta_{jt}^{v} = \beta_4 M_{jt}^{\text{total}} + \mu_j^{v} \tag{4}$$

The median candidate in the sample spends 95% of her funds raised. Thus, I abstract away from a candidate's choice of how much to spend and instead treat candidate fundraising as candidate spending.

In sum, the voter choice model allows for heterogenous voters to choose between horizontally and vertically differentiated candidates, or abstain. Voters are distinguished by their ideologies, which affect the horizontal distance to their candidate options, as well as their overall tendency to turn out to vote. Candidates are distinguished in horizontal ideology space, as well as vertical quality (δ^v) space. Individuals have heterogeneous preferences over candidate ideology depending on their ideological location but agree with other same-party voters on a candidate's vertical quality, consistent with results from Iaryczower et al. (2022). Modeling vote choice as a function of both individual and candidate ideologies allows for richer substitution patterns than would arise from standard logit.

Given the type 1 extreme value distribution for ϵ_{ijt}, the probability individual i votes for candidate j in election cycle t is given by:

$$s_{ijt}^{v} = \frac{e^{(\beta_1(y_j - y_i^v)^2 + \beta_2|y_i^v| + \beta_3 \mathbb{1}\{\text{same party}\}_{ij} + \delta_{jt}^v)}}{1 + \sum_{j \in \{D,R\}} e^{(\beta_1(y_j - y_i^v)^2 + \beta_2|y_i^v| + \beta_3 \mathbb{1}\{\text{same party}\}_{ij} + \delta_{jt}^v)}} \tag{5}$$

Candidate j's vote share in election cycle t can be written, where N is the number of individuals in the district:

$$s_{jt}^{v} = \frac{1}{N} \sum_{i} s_{ijt}^{v} \tag{6}$$

The probability individual i chooses candidate j in election cycle t conditional on voting for a candidate $j \in g = \{D, R\}$ is:

$$s_{ijt|g}^{v} = \frac{e^{(\beta_1(y_j - y_i^v)^2 + \beta_2|y_i^v| + \beta_3 \mathbb{1}\{\text{same party}\}_{ij} + \delta_{jt}^v)}}{\sum_{j \in \{D,R\}} e^{(\beta_1(y_j - y_i^v)^2 + \beta_2|y_i^v| + \beta_3 \mathbb{1}\{\text{same party}\}_{ij} + \delta_{jt}^v)}} \tag{7}$$

Candidate j's inside vote share in election cycle t (conditional on voters choosing a candidate $j \in g = \{D, R\}$) can be written:

$$s^v_{jt|g} = \frac{1}{N}\sum_i s^v_{ijt|g} \tag{8}$$

5.2.2 Win Probability Model

In the model, candidates want to maximize their win probability. In electorally balanced districts, win probability and share maximization objectives are similar. But election competitiveness varies widely across districts, and the majority of congressional districts in the United States are electorally lopsided and host landslide elections.[25]

A candidate wins her election if and only if her vote share is larger than her opponent's. To add some ex-ante uncertainty from the candidate's perspective, I suppose the model-predicted vote shares from the individual voter choice model are correct up to an extreme value type 1 distributed polling error. Candidate j's true inside vote share is the sum of her model predicted inside vote share and some error, η_j. I omit t subscripts in what follows.

$$s^v_{j|g} = \hat{s}^v_{j|g} + \eta_j \tag{9}$$

where $s^v_{j|g}$ is candidate j's inside vote share. Then, candidate j's win probability, $\pi(s_{j|g})$, is:

$$\pi(s_{j|g}) = \text{Prob}(s_{j|g} > s_{-j|g}) = \text{Prob}(\hat{s}_{j|g} + \eta_j > \hat{s}_{-j|g} + \eta_{-j}) \tag{10}$$

With the error distributed extreme value type 1, candidate j's win probability is:

$$\pi(s_{j|g}) = \frac{e^{\hat{s}_{j|g}}}{e^{\hat{s}_{j|g}} + e^{\hat{s}_{-j|g}}} = \frac{1}{1 + e^{\frac{1}{\sigma}(\hat{s}_{-j|g} - \hat{s}_{j|g})}} \tag{11}$$

The key object from the voter choice and win probability models is the derivative of win probability with respect to candidate ideology choice, which is comprised of four derivatives.

$$\frac{\partial \pi_j(s_{j|g})}{\partial y_j} = \frac{\partial \pi_j(s_{j|g})}{\partial (s_{j|g} - s_{-j|g})}\left[\frac{\partial (s_{j|g} - s_{-j|g})}{\partial y_j} + \frac{\partial (s_{j|g} - s_{-j|g})}{\partial M_j}\frac{\partial M_j}{\partial y_j}\right] \tag{12}$$

The first term in the brackets is the direct effect of ideology on the difference in candidate inside vote shares: voters prefer ideologically close candidates (equation 13).

[25] https://fivethirtyeight.com/features/what-we-lose-when-we-lose-competitive-congressional-districts/

$$\frac{\partial(s_{j|g} - s_{-j|g})}{\partial y_j} = \frac{1}{N}\sum 4\beta_1(y_j - y_i^v)s_{ij|g}^v(1 - s_{ij|g}^v) \tag{13}$$

The second term in the brackets includes advertising's effectiveness in getting vote share multiplied by the direct effect of ideology on fundraising (equation 14). I delay discussion of $\frac{\partial M_j}{\partial y_j}$ to the next section (see equation 19).

$$\frac{\partial(s_{j|g} - s_{-j|g})}{\partial M_j} = \frac{1}{N}\sum 2\beta_4 s_{ij|g}^v(1 - s_{ij|g}^v) \tag{14}$$

The terms in the square bracket are multiplied by the derivative of the win probability function with respect to the difference in candidate vote shares. For competitive districts, this derivative is large; for electorally lopsided districts, small (see equation 15).

$$\frac{\partial \pi_j(s_{j|g})}{\partial(s_{j|g} - s_{-j|g})} = \frac{\frac{1}{\sigma}e^{-\frac{1}{\sigma}(s_{j|g} - s_{-j|g})}}{(1 + e^{-\frac{1}{\sigma}(s_{j|g} - s_{-j|g})})^2} \tag{15}$$

5.3 Donor

While individuals are only eligible to vote in one election, they can donate to Republican and Democrat candidates standing for election in any congressional district in the country. An individual's choice set includes all of her party's general election candidates (up to 435). I model the utility individual i living in district o and belonging to party p receives from donating to candidate $j \in J_p^d$ in year t as:

$$\begin{aligned} u_{ijt}^d = {} & \alpha_1(y_j - y_{opt}^d)^2 + \alpha_2 \mathbb{1}\{\text{same district}\}_{ij} \\ & + \alpha_3|\text{win prob}_{jt} - 0.5| + \alpha_4|\text{win prob}_{jt} - 0.5| \times \mathbb{1}\{\text{same district}\}_{ij} \\ & + \mu_{opt}^d + \mu_j^d + \xi_{jopt} + \epsilon_{ijt}^d \end{aligned} \tag{16}$$

where J_p^d is the donation choice set available to individual i identifying as a member of party $p \in \{\text{D, R}\}$, y_j is candidate j's ideology, y_{opt}^d is individual i's ideology (set equal to her district-party's average ideology), win prob$_{jt}$ is candidate j's ex-ante win probability in election cycle t, μ_{opt}^d are origin-party-year fixed effects, μ_j^d is candidate j's mean utility according to donors, ξ_{jopt} is an origin party-candidate-election cycle demand shock that donors observe but the researcher does not, and ϵ_{ijt}^d is an idiosyncratic, unobserved component of donor utility assumed to be distributed type 1 extreme value. Utility of the outside option, abstaining from donating to a House candidate, is:

$$u^d_{op0t} = \epsilon^d_{op0t}$$

Candidate j's share from origin-party op in election cycle t is:

$$s^d_{opj} = \frac{e^{(\alpha_1(y_j - y^d_{opt})^2 + \alpha_2 \mathbb{1}\{\text{same district}\}_{opj} + \alpha_3 |\text{win prob}_{jt} - 0.5|_{jt} + \mu^d_{opt} + \mu^d_j)}}{1 + \sum_{j \in J_p} e^{(\alpha_1(y_j - y^d_{opt})^2 + \alpha_2 \mathbb{1}\{\text{same district}\}_{opj} + \alpha_3 |\text{win prob}_{jt} - 0.5| + \mu^d_{opt} + \mu^d_j)}} \tag{17}$$

I specify an origin-party's market size, S_{op} to be twice as large as the maximum amount it ever donates to House candidates in an election cycle. Multiplying an origin-party's choice probability for candidate j by its market size, S_{op}, and summing over all origin parties gives candidate j's total individual fundraising, M_j.

$$M_j = \sum_{op} S_{op} s^d_{opj} \tag{18}$$

The key object from the donor model is the derivative of candidate fundraising with respect to candidate ideology choice.

$$\frac{\partial M_j}{\partial y_j} = \sum_{op} S_{op} \times 2\alpha_1 (y_j - y^d_{op}) s^d_{opj} (1 - s^d_{opj}) \tag{19}$$

5.4 Equilibrium

An equilibrium to this game is a pair of candidate ideologies $\{y_j, y_{-j}\}$ in every district that satisfy the vector of candidate first order conditions (equation 2) such that vote shares (equation 6) and money supply (equation 18) are consistent with the donor and voter models.

6 Estimation and Results

Estimation of the model requires estimates of voter, donor, and candidate preferences. I start with estimation of voter preferences, then donor preferences, and finally, candidate preferences.

6.1 Voter Demand

I describe the estimation of the win probability model in three steps. First, I estimate individual voter choice using microdata, which delivers candidate vote shares, s, as a function of candidate ideology. Second, I calibrate advertising efficacy, which relates candidate vote shares to candidate

spending. Finally, I embed candidate vote shares into a model of win probability, which requires estimating the degree of polling error governing the shape of the win probability function. This last step delivers win probability as a continuous function of vote shares, and consequently, of ideology.

To estimate the parameters of voter utility, I use a combination of two data sources. First, I observe a repeated cross section of individuals' ideologies, candidate ideologies, vote choices, and validated turn out from the Cooperative Election Study (CES). Second, I observe realized candidate vote shares from MIT Election lab. I calculate the share of potential voters who abstain from voting using Census data on each district's voting age population. Estimation of the individual vote choice model follows the micro BLP approach of Goolsbee and Petrin (2004). Additionally, I recover candidate vertical quality by equating model-predicted shares to actual aggregate shares (as opposed to survey shares), as in Chintagunta and Dube (2005).

For a guess of voting parameters, $\theta^v = \{\beta_1, \beta_2, \beta_3\}$, I use a nested fixed point estimator to maximize the individual likelihood:

$$\begin{aligned} \underset{\theta^v}{\text{maximize}} \quad & \sum_i \sum_{\text{j}} \log(s^v_{ij}(\theta^v, \delta(\theta^v))) \times \mathbb{1}(i \text{ voted for } j) \\ \text{subject to} \quad & s^v_j(\theta^v, \delta^v_j(\theta^v)) = \bar{s}^v_j \ \forall j \end{aligned} \tag{20}$$

where $\bar{s}^v_j$ is the observed aggregate vote share for candidate j and the model-predicted shares, $s^v_j(\theta^v, \delta^v(\theta^v))$ are given in equation 6.

$$s^v_j(\theta^v, \delta^v(\theta^v)) = \frac{1}{N} \sum_i \frac{e^{(\beta_1(y_j - y^v_i)^2 + \beta_2|y^v_i| + \beta_3 \mathbb{1}\{\text{same party}\}_{ij} + \delta^v_{jt})}}{1 + \sum_{j \in \{D,R\}} e^{(\beta_1(y_j - y^v_i)^2 + \beta_2|y^v_i| + \beta_3 \mathbb{1}\{\text{same party}\}_{ij} + \delta^v_{jt})}} \tag{21}$$

Normally, one needs to instrument for the supply-side choice variable, typically the price, when estimating a demand model, even if one has microdata (Berry and Haile, 2020). Endogeneity arises in the standard mixed logit framework (Berry et al., 1995) as consumer utility depends on a product-market demand shock, which is unobserved by the econometrician but affects the supply-side choice. As prices typically vary at the product-market level, including product-market fixed effects to address the endogeneity absorbs all the variation in prices. In my context, candidate ideology has the same endogeneity problem as price. But here, ideological distance — which varies across voters for a candidate in a given election — acts as an individual-specific price in the voter utility model. Thus, I am able to control for the endogeneity of ideology by including candidate-election fixed effects without absorbing all of the variation in ideological distance across voters. This permits identification of θ^v without instrumenting for a candidate's ideology choice.

The ideological distance coefficient (β_1) is identified from how within-candidate variation across same-party individuals' ideological positions correlates with their tendency to vote for candidates with a given ideology. The parameter governing how individual ideological extremeness affects turnout, β_2, is identified by the correlation between individual ideological extremeness and turn out in the survey. β_3 is identified by the differential tendency for individuals to vote for a same-party candidate. Candidate voter mean utilities, δ_{jt}^v are the unique values that rationalize observed vote shares (Berry, 1994).

Maximizing the likelihood identifies all parameters except those absorbed in the candidate fixed effect, which includes advertising efficacy. There is a large literature aimed at estimating the causal effect of advertising on vote shares (Gerber, 1998, 2004; Rekkas, 2007; Da Silveira and De Mello, 2011; Gordon and Hartmann, 2013; Levitt, 1994).[26] I calibrate the advertising efficacy parameter such that the median advertising elasticity implies that a vote costs \$120, as in Gerber (1998). This is a conservative choice: If only a fraction of fundraising is used for advertising, then using advertising efficacy estimates from the literature will imply more effective advertising. I show robustness to this calibration choice — reversing the take-home result requires that ad spending is three times more effective than the estimate in (Gerber, 1998) (nine times more effective than what is implied from the estimate in (Levitt, 1994)).

Finally, I estimate the standard deviation of the polling error, σ, which determines the curvature of the win probability function. I use two data sources to calculate σ: House polls from FiveThirtyEight.com and ex-post outcomes from MIT Election Lab. For each election, I calculate the poll-predicted difference in inside votes shares and the ex-post difference in realized inside vote shares. σ is calculated as the standard deviation of the difference between the two objects. If polls exactly predict outcomes, σ would equal 0. Larger values of σ indicate more poll uncertainty.

Estimates from the voting model are shown in Table 5. The top panel presents the results from the microdata discrete choice voter model: individuals dislike ideological distance, more extreme individuals are more likely to turn out, and voters prefer same-party candidates consistent with results in Iaryczower et al. (2022) and Tausanovitch and Warshaw (2018). The estimates imply that the median candidate could increase her win probability by 0.0002 p.p., or 59 votes, by becoming 1% more moderate. The second panel reports the effect of candidate spending on vote shares, which

[26] In general, OLS estimates of candidate vote shares on spending may be upwardly biased, if for example, unobservably good candidates tend to fundraise high amounts and also attract lots of votes. On the other hand, OLS estimates of spending efficacy may be downward biased if candidates in toss-up races — facing an unobservably good opponent — fundraise more relative to candidates in lopsided (in their favor) districts.

I calibrate in a second stage to recover candidate vertical quality separate from advertising spend.

I estimate the standard deviation of the polling error, σ, to be small, suggesting that polls are accurate. Thus, candidates in lopsided electoral districts find themselves on a flat part of the win probability curve: Their ideology choice has little effect on their win probability. On the other hand, candidates running in competitive districts are on the steep portion of the win probability curve where their ideology choice is more consequential.

Using the estimated parameters, I calculate the direct effect of changed ideology on win probability (equation 12 without the second term in the brackets) for every candidate, and Figure 8 plots these derivatives. A point on the figure is a candidate. The horizontal axis shows a candidate's election difference in inside vote shares between the two candidates (*Distance from a tie*). A value of zero indicates the election was tied; a value of one, an uncontested race. The vertical axis displays what win probability the candidate stands to gain for becoming moderate. Democratic candidates moderate by choosing a larger ideology, while Republican candidates moderate by choosing a smaller ideology. For the plot, Republican candidates' derivatives are multiplied by -1. In general, candidates stand to gain win probability by moderating, and this is especially true of candidates running in competitive districts.

6.2 Donor Demand

Next, I discuss how the donor demand model is estimated. Given the donor utility model described earlier, market shares for candidate j in origin-party-year opt, s_{jopt} take on the standard form as in Berry (1994). The estimating equation is as follows:

$$\begin{aligned}\ln(s_{jopt}) - \ln(s_{0opt}) = \alpha_1(y_j - y^d_{opt})^2 + \alpha_2 \mathbb{1}\{\text{same district}\}_{opj} \\ + \alpha_3|\text{win prob}_{jt} - 0.5| + \alpha_4|\text{win prob}_{jt} - 0.5| \times \mathbb{1}\{\text{same district}\}_{opj} \\ + \mu^d_{opt} + \mu^d_j + \xi_{jopt}\end{aligned} \tag{22}$$

To estimate the parameters of the donor model, I use a six-election cycle origin-by-party-by-candidate panel spanning the 2010 to 2020 cycles. This sample spans the post-2010 Census redistricting, which provides useful identifying variation to estimate α_3. I return to this below.

As in the voter model, I use within-candidate variation to identify donor preference for ideological distance. I also include origin-party-year fixed effects to control for each origin-party's tendency to

give. I do not observe a potential donor's demographics as well as her donation choice, so I impose that an individual's ideology equals her district-party's average ideology. The same district indicator is equal to 1 when candidate j runs in origin district o. The inclusion of candidate fixed effects, μ_j^d, means identification of α_1, the key parameter of interest, comes from the within-candidate correlation of ideological distance to an origin-party and amount donated from that origin-party.

Donor preference for giving to candidates in competitive elections, α_3 is identified using within-candidate redistricting-induced variation in their district's competitiveness. After the 2010 redistricting, candidates found themselves in districts that were more, or less, competitive relative to their districts before redistricting.[27] I measure a district's competitiveness using the two-party vote share difference from the prior presidential election, as in Waldfogel (2025). These vote shares better capture underlying district partisan preferences rather than, say, House vote shares, which are themselves a function of House candidate identities. I create a measure of candidate win probability (which spans 0 to 1) by inputting the two-party vote share difference in the estimated win probability function. I calculate a candidate's district's lopsidedness as the absolute value between the candidate's win probability and 0.5 (a true toss-up).

The inclusion of the *same-district* indicator allows for the possibility that donors are home-biased. An α_4 estimated to be different from zero allows donors to be differentially sensitive to their home-district's competitiveness.

Table 6 reports results from a series of donation model specifications that include progressively more controls, building up to the specification in equation 22. Column (1) presents the results from a specification with no fixed effects nor controls. The coefficient on squared ideological distance is negative and significant, suggesting donors prefer ideologically-close candidates. Column (2) includes origin-party-cycle fixed effects, while column (3) includes candidate fixed effects. The coefficients on squared ideological distance remain negative and significant. The specification in Column (4) includes both origin-party-cycle and candidate fixed effects, while Column (5) adds a within-district indicator as a control variable. Through all specifications, the coefficient on squared ideological distance remains negative and statistically significant.

Column (6) presents the parameter estimates from the full model. The coefficient on squared ideological distance implies that the median candidate would gain about \$1,000 for a 1% move to the extreme. The coefficient on the within-district indicator is large and positive, reflecting donor

[27] Redistricting variation such as this has been used to study candidate behavior in Canes-Wrone and Miller (2022) and Jones and Walsh (2018).

home bias. The coefficient on district lopsidedness ($|\text{win prob}_{jt} - 0.5|$) is negative, indicating that donors prefer giving to candidates in competitive races, consistent with results in (Gimpel et al., 2008; Barber et al., 2017). The negative coefficient on the interaction between district lopsidedness and within-district indicates that donors are especially responsive to their home-district's competitiveness, consistent with results from (Waldfogel, 2025).

Robustness I probe the robustness of the donor demand results in three ways. First, I use an alternate measure of candidate ideology to ensure the cfscore measure of candidate ideology is not driving the results. Second, aggregate donations to the state level to alleviate the problem of zero-valued donations. I also estimate the model on a sample of origin-destination pairs for which the destination is most likely to be in the origin's consideration set. Third, I add additional controls that vary at the origin district-candidate district level to explore whether unobserved demand shocks at the origin party-candidate-cycle level appear to be biasing the estimate of donor preference for ideological closeness.

The main donor results measure candidate ideology using candidate cfscores (Bonica, 2014). Measures of candidate ideology capture context-specific factors (Tausanovitch and Warshaw, 2017). To ensure the results do not depend on context-specific factors in measuring cfscores, I explore the robustness of the donor demand results using the CES measure of candidate ideology (average survey perceptions of candidate ideology). The results in Column (1) of Table A3, which use CES ideology, imply a fundraising elasticity of 0.33 (about \$1,500) with respect to ideology, similar to the elasticity implied from the specification using cfscores to measure candidate ideology. The results are robust to using an alternative measure of candidate ideology that is based on voter perceptions of candidates.

Next, I probe the consequences of endogenous choice sets on the coefficient estimates. The median candidate receives donations from 58 origin districts, and the main donor estimation data only includes the origin-party-candidate-election cycle observations with at least one donation. It could be that a candidate enters an origin-party's choice set based on the ideological distance between them, which would introduce bias in the estimated coefficient on ideological distance. To probe the severity of this potential bias, I re-estimate the donor model using an origin state-party by candidate-election cycle aggregation of the data to reduce the observations dropped due to having zero-valued donations. Column (2) of Table A3 shows the results for the data aggregated to the origin-state party level (as opposed to origin-district party level). The estimated coefficients imply

an elasticity of 0.37, or around $1,700, which is similar to that of the baseline. In addition to estimating the model on aggregated data, I also restrict the sample to origin-by-destination pairs that the origin is most likely to consider. Column (3) of Table A3 shows the main donor model specification estimated on a sample of same-state origin and destination congressional districts. Individuals may be more aware of elections happening within their home state regardless of the candidate's ideology, lessening concern about endogenous choice sets. The estimated coefficients imply an elasticity of 0.25, or around $1,200 for becoming 1% more extreme.

Finally, unobserved shocks at the candidate-by-origin party-year may be correlated with ideological distance, leading to biased estimates. To assess the robustness of the baseline estimates, I include covariates that vary across origin and destination districts, as well as a specification that includes candidate-cycle fixed effects. Column (4) presents the coefficient estimates from a model that includes candidate-by-election cycle fixed effects. Column (5) adds additional controls: The social connectedness between origin o and destination district (candidate j's district), the geographic distance between origin and destination districts, and a within-state indicator.[28] The coefficient estimates are very similar to the baseline estimates, assuaging concerns of unobserved demand shocks biasing estimates.

6.3 Candidate Supply-Side Ideology Choice

The model is closed with the supply-side candidate objective, which relates demand-side objects to each candidate's chosen ideology. Candidate j's optimal ideology choice is a function of the demand-side incentives she faces. For ease of flow, equation 2 is repeated:

$$y_j = \frac{1}{2\lambda_2}\left(\frac{\partial \pi(y_j, y_{-j})}{\partial y_j} + \frac{\partial \pi(y_j, y_{-j})}{\partial M(y_j)}\frac{\partial M(y_j)}{\partial y_j}\right) + \frac{\lambda_1}{2\lambda_2}\left(\frac{\partial M(y_j)}{\partial y_j}\right) + \bar{y}_j \tag{23}$$

where the chosen ideology, y_j, and right-hand side derivatives, $\frac{\partial \pi}{\partial y}$, $\frac{\partial \pi}{\partial M}$, and $\frac{\partial M}{\partial y}$ are observed. $\bar{y}_j$ is candidate j's personal ideological preferences. Relating demand-side derivatives to candidate ideology choice requires estimating two parameter values that best rationalize the observed equilibrium: λ_1, the weight candidates place on fundraising, and λ_2, the weight candidates place on staying close to their personal ideal point.

To identify $\frac{1}{2\lambda_2}$, the parameter governing the relationship between win incentives and ideology choice, the ideal experiment takes two identical candidates and offers one candidate more win

[28] The social connectedness comes from Facebook's Social Connectedness Index.

probability for moderating her ideology. The experiment asks whether the candidate who could increase her win chances more by moderating moderates more, which would imply an estimate $\frac{1}{2\lambda_2} > 0$. The stronger the relationship between win probability incentives and ideology choice, the larger would be $\frac{1}{2\lambda_2}$ and the smaller λ_2 would be: Candidates find it worthwhile to deviate from $\bar{y}$ if it means gaining win probability.

To identify $\frac{\lambda_1}{2\lambda_2}$, the parameter relating fundraising incentives to ideology choice, the ideal experiment would give some candidates a larger fundraising boost for becoming extreme, all else constant. If candidates who could gain more donations by becoming extreme indeed choose more extreme ideologies, we would infer $\frac{\lambda_1}{2\lambda_2} > 0$, and $\lambda_1 > 0$. If λ_1 is large relative to λ_2, candidates find pursuing fundraising incentives especially worthwhile, even if it means deviating from $\bar{y}$.

Absent this set of ideal experiments, there are two key challenges to estimating the supply-side parameters that govern candidate ideology choice. First, the right-hand side derivatives are evaluated at the candidate's endogenous choice such that they are mechanically correlated with the error term, $\bar{y}_j$. To overcome the endogeneity of the right-hand side incentives, I employ an instrumental variable estimation strategy in which the instruments capture the supply of votes and supply of money a same-party generic candidate would face running in the district. Second, the incentives to win a primary election may affect a candidate's ideology choice, and these incentives may pull in the same direction as fundraising incentives, leading to overestimation of the weight candidates place on fundraising. I estimate specifications that control for primary election incentives and estimate similar supply-side weights regardless of these controls.

To instrument for the demand-side incentives, I construct measures of incentives that a same-party generic candidate would face if she stood for election in candidate j's district. In particular, as an instrument for candidate win probability incentives, I evaluate the win probability derivative function at the median ideology of candidates in candidate j's party and the median values of candidate vertical qualities (vote and donation). Similarly, as an instrument for candidate fundraising incentives, I evaluate the fundraising derivative function at median values of same-party candidate ideology and median values of candidate qualities. The instruments capture the supply of general election win probability and donations a generic same-party candidate would face if she stood for election in candidate j's district. The exclusion restriction requires that the supply of general election votes and money affect a district-party's candidate's general election position only through their effects on win probability and fundraising incentives. The results are shown in Column (1) of Table 7.

Positive coefficients indicate that candidate ideology responds to win probability and fundraising incentives. The magnitudes imply that a one-standard deviation increase in win probability incentive for moderating leads candidate ideology to become a tenth of a standard deviation more moderate. A one-standard deviation increase in fundraising gains for becoming extreme leads candidate ideology to become a third of a standard deviation more extreme.

Absent controls for ideological differences across candidates, a potential violation of the exclusion restriction is that candidates with different innate ideologies select into certain races. For example, candidates with extreme innate ideologies may run in districts where fundraising incentives to being extreme are large. This would lead to overestimation of the weight candidates place on fundraising incentives. I flexibly control for same-party district preferences, ex-ante district competitiveness, and their interactions. Same-party district preferences are meant to control for a candidate's position absent general election incentives, while their interactions with ex-ante district competitiveness allow candidates in different electoral environments to place different weights on same-party district preferences. The results, estimated with these additional controls, are shown in Column (2). The estimated weights candidates place on win probability and fundraising incentives are similar to those in Column (1) estimated without controls. The weights increase with these additional controls, which is reassuring that candidate selection is likely not upwardly biasing the coefficients.

Identification comes from across-district comparisons of how win probability and fundraising incentives correlate with candidate position. One could also be concerned that candidate positions trade off incentives beyond those which are modeled, namely the pressure to win a primary election. In particular, the concern would be as follows: candidates in lopsided districts, who have little win probability to gain by moderating and perhaps large fundraising incentives to be extreme, choose extreme positions. However, it could be that these candidates locate themselves at the extremes because they are concerned with winning the primary election — in which only same-party voters choose among same-party candidates. Without accounting for this, we might overestimate the weight candidates place on fundraising (to the extent fundraising and primary election incentives tend to pull candidates in the same direction).

I explore whether the estimates are sensitive to this concern in two ways. I first restrict the estimation sample to include districts where the general election is ex-ante expected to be competitive (districts where the last presidential election vote share difference was less than 20 p.p., and then 10 p.p.). The model's candidate objective function likely best describes the behavior of candidates in these districts. Also, I restrict the estimation sample to candidates running in district-parties that

rarely host a primary. I consider a district-party primary rare if the district-party holds no primary in at least four election cycles (out of the five possible in the data). I also estimate the parameters using a sample that does not host a primary in that year.

The results from these alternative estimation samples are shown in Columns (3) through (6) of Table 7. Compared to the estimates using the full sample in Column (1), restricting to ex-ante competitive districts (Columns (3) and (4)) leads to larger estimates for the weight candidates place on fundraising and smaller point estimates for the weight candidates place on win probability. Further sample restrictions on the presence of a primary election deliver larger estimates for the weights candidates place on both incentives. If anything, accounting for primary election incentives leads to larger estimates of the weight candidates place on fundraising.

7 Counterfactuals

With estimated models of the supply of and demand for candidate ideology, I explore two counterfactual scenarios. The first, a prohibition on out-of-district giving, shows the extent to which the promise of out-of-district funds have led candidates to adopt more extreme positions. While the ban has the intended effect of reducing political polarization, it also hinders individuals' ability to participate in politics. Motivated by this consequence, the second counterfactual examines what would happen if congressional districts were drawn to reflect state-wide preferences, akin to districts drawn without gerrymandering. If candidates find themselves in more competitive districts, on average, they may moderate more in response to the higher win probability incentives for doing so. Even more, donors, too, may find themselves in more competitive districts, and as a result, may endogenously reduce their out-of-district gifts in favor of donating to local House candidates, giving candidates less of a fundraising incentive to choose extreme positions. Drawing districts to reflect state-wide preferences may mitigate polarization in two ways: by making elections more competitive and by endogenously reducing the supply of out-of-district donations.

7.1 Ban Out-of-District Donations

Observers have pointed out the potentially unwanted incentives non-local donors exert on candidates. In the paper's first counterfactual, I calculate the effect of out-of-district donors on polarization. To do this, I restrict individual donors' choice sets from candidates in 435 districts in the status quo to only the candidate in their district.

The inability of individuals to target their cross-district giving to extreme candidates reduces incentives for candidates to choose extreme ideologies. Candidates respond to this new environment by moving to the center: the ideological distance between the median Republican and Democrat candidates decreases by 2%.

I investigate the robustness of this result to the range of estimated supply-side parameters presented in Table 7. I calculate the reduction in polarization implied by each model in Table 7. The estimates imply that a prohibition on out-of-district donations leads to between a 2.25% (Column (1)'s estimates) to 6% reduction in polarization (Column (5)'s estimates).

The average Democrat (Republican) shifts to be 4.2% (1.3%) closer to their district's voter's average ideology. Democrat candidates in competitive districts change their ideology the most — becoming 6% closer to their average constituent's ideology — in response to the prohibition. The asymmetric effects by party reflect that status quo incentives are different. In the status quo, the average Democrat candidate received 76% of her donations from out-of-district, while the average Republican candidate received 69%. After the prohibition, the average Democrat candidate's fundraising reward for becoming extreme is one-fifth that of the status quo. The average Republican candidate's fundraising reward is about a third as big in the counterfactual relative to the status quo.

7.2 Implications for Individual Political Participation

While a prohibition on out-of-district giving reduces polarization, it also dampens individuals' ability to participate politically via donating. Individuals prefer giving to competitive, out-of-district races, and the prohibition reduces their ability to do so. In the status quo, candidates in competitive elections raised, on average, $\$600,000$ more from individuals than candidates in noncompetitive races. Under the prohibition, by contrast, candidates in competitive elections receive only $\$200,000$ more from individuals compared to candidates in noncompetitive elections.

Under the prohibition, individuals can only give to candidates in competitive races if they happen to reside in a district that hosts a competitive election. In 2010, less than one fifth of congressional districts hosted a competitive House election (two-party vote share difference of less than ten percentage points), and the share has only been declining since.[29] Waldfogel (2025) shows that individual donors give more to out-of-district House candidates — especially those in competitive elections — when their home congressional district becomes less competitive following

[29] https://fivethirtyeight.com/features/what-we-lose-when-we-lose-competitive-congressional-districts/

redistricting. Thus, banning out-of-district giving silences what may be an increasingly important form of individual political participation.

Moreover, banning individual out-of-district donations may give rise to individuals getting around the ban by, for example, giving to PACs who can give to candidates.[30] The next counterfactual considers a policy that could result in an endogenous reduction in out-of-district giving.

7.3 Statewide Uniform Districts

Whereas a prohibition may lead individuals to find other giving outlets, re-configuring districts to be more competitive could lead to an endogenous reduction in giving. If out-of-district giving is, in part, a response to lopsided home districts, could drawing districts to be more competitive endogenously reduce out-of-district giving? It is not clear, ex-ante, what effect making the majority of districts more competitive will have on donors' tendencies to give out-of-district. On the one hand, living in a more competitive district should tend to raise within-district donations. On the other, when the majority of all other districts are competitive, those options, too, become more attractive, leading to potentially more out-of-district giving. I explore this question in a counterfactual that "redraws" congressional districts so that each contains constituents that reflect statewide political preferences.

I implement the counterfactual by making six changes to the status quo: three on the donor side and three on the voter side. On the donor side, I change each origin-party's average ideology (y^d_{opt} in equation 22) and market size to the state-wide party averages, S_{op} in equation 18. Next, I adjust each candidate's ex-ante win probability in donor utility to reflect that the candidate's district has its state's state-wide average competitiveness ($|\text{win prob}_{jt} - 0.5|$ in equation 22).

On the voter side, I simulate each district's constituents by randomly drawing from the state-wide distribution of voter ideologies (y^v_i in equation 3). Second, I calculate each state's state-wide Democrat and Republican shares by taking the average over the (equal-in-population) districts' vote shares and impose that candidate's expected vote shares are equal to the state-wide average (the difference in vote shares enters equation 11). One could instead calculate the updated expected win probability using the status quo candidate δ^v and updated voter ideology distribution. By matching expected vote shares to statewide shares instead, this implicitly allows a new set of δ^v to enter the race. In particular, it allows more evenly-matched candidates to run against each other in newly competitive districts. This adjustment is a reduced-form way to capture the selection of more

[30] Aparicio and Avenancio-León (2022) find that when corporate contributions were banned in Brazil, individuals associated with corporations increased their individual gifts.

evenly-matched candidates in ex-ante competitive districts. In the status quo data, rival candidates in ex-ante competitive districts have 15% more similar δ^vs than rivals in uncompetitive districts. Third, and finally, I update candidate full win probability derivatives (equation 12), which include donation derivatives, with their updated donation derivatives.

In the uniform statewide district counterfactual, 70% of districts are more competitive than they are in the status quo. Districts drawn to reflect statewide preferences have an average two-party vote share difference of 14 p.p. relative to 23 p.p. in the status quo. Districts in Indiana, North Carolina, and Ohio become toss-ups.[31] Figure 10 shows how the "uniform statewide districts" counterfactual changes each district's lopsidedness. The x-axis plots the district's status quo two-party vote share difference, while the y-axis plots the district's state-wide two-party vote share difference. Higher values of two-party vote share difference indicate less competitive districts. Most districts lie below the 45 degree line, indicating that they are more competitive in the uniform statewide districts counterfactual relative to the status quo.

I calculate the counterfactual's effect in two stages. First, I hold constant status quo fundraising incentives and calculate how candidates' ideologies would change faced with their updated win probability incentives. Due to changed win probability incentives alone, the distance between the median Democrat and Republican candidates falls by 1.6%. Next, I incorporate the changes to the donor side, and recalculate candidate ideologies with the full uniform statewide districts counterfactual.

Districts drawn to reflect statewide preferences will tend to reduce out-of-district giving if donors are moved from uncompetitive to competitive districts. In the status quo, the average Republican donation dollar originates from a district with a 53% chance the Republican candidate wins, while the average Democrat donation dollar originates from a district that has a 74% chance the Democrat wins. Statewide uniform districts disproportionately move Democrat donors rather than Republican donors from lopsided districts to competitive districts.

This shift is depicted in Figure 11. The left panel shows the proportion of each party's potential donation dollars originating from deciles of district competitiveness in the status quo. Potential donation dollars refers to the market size of donation dollars, S_{op}, discussed in section 6.2. Over one third of Democrat potential donation dollars originate from deep blue districts — those where the Democratic presidential candidate received at least 69.3% of the vote. In the counterfactual where districts are drawn to reflect statewide preferences (right panel), virtually all of the Democratic potential donation dollars that originated from the most lopsided blue districts are instead drawn

[31] I define a district as toss-up if the two-party vote share difference is less than 10 p.p.

into more competitive districts (where the Democratic presidential candidate received between 62 and 69% of the vote). Districts drawn to reflect statewide preferences makes it so that nearly half of Democratic potential donation dollars originate from these, more competitive, districts. The Democrat donors drawn into these newly more competitive districts decrease their out-of-district gifts by 60 million dollars. While this decrease is partially offset, overall Democratic out-of-district gifts decrase by approximately $50 million, or 20% of status quo out-of-district gifts. Republican out-of-district donations, by contrast, are little changed by counterfactually-drawn statewide uniform districts. Republican donors reduce their out-of-district giving by 6 million dollars, a 4% change relative to their status quo out-of-district gifts.

The asymmetry in how statewide uniform districts affect each party's donor pool leads to stronger de-polarizing effects for Democratic candidates. Relative to the status quo, the median Democrat candidate has 20% less fundraising to gain by becoming extreme. Changed fundraising incentives lead Democrat candidates to choose even more moderate positions than their positions from changed win probability incentives alone. By contrast, Republican candidates' fundraising incentives for becoming extreme increase slightly (4% for the median candidate), leading them to choose slightly more extreme positions in the full uniform statewide districts counterfactual. This is driven by increased within-district giving in districts that become more competitive.

Figure 12 plots the polarization reductions for each of the counterfactual scenarios considered. Drawing districts to contain statewide preferences has a slightly larger polarization reduction than a ban on out-of-district donations. The endogenous reduction in out-of-district donations alone from drawing statewide uniform districts leads to half of the polarization reduction of a prohibition on out-of-district giving.

8 Conclusion

The rise in cross-district donating stands to alter the geographically representative nature of the House by exacerbating incentives for politicians to eschew their constituents' preferences in pursuit of money. Because donors tend to be ideologically extreme, these fundraising incentives pull candidates to the ideological poles, potentially contributing to record-high levels of polarization.

To quantify the extent to which candidate pursuit of ideologically-extreme, out-of-district money has contributed to polarization, I estimate a structural model of the market for candidate ideology. I model two distinct demand-side groups — voters and donors — as well as candidates' supply-side

ideology choice. On the demand side, donors and voters prefer ideologically-proximate candidates. On the supply side, candidate ideology choice maximizes a weighted sum of win probability and fundraising: Candidates trade off appealing to voters and donors. Using the model, I find that a prohibition on out-of-district donations leads to less individual donating, more moderate candidates, and a 2.25% reduction in polarization. In a second counterfactual, I find that drawing districts to reflect state-wide preferences (akin to no gerrymandering) reduces polarization by 2.8%. Through its effect on donors alone, districts drawn sans gerrymandering achieve over half of the depolarizing effects (1.25%) of a complete ban on out-of-district giving.

This paper's model and ensuing counterfactuals highlight the interdepencies between lopsided districts, out-of-district giving, and candidate polarization. On the one hand, most candidates stand for election in electorally lopsided districts giving them little reason to appeal to their across-the-aisle district's voters. Instead, candidates can raise more funds by positioning themselves to appeal to their party's national donor pool. A prohibition on out-of-district giving reduces candidate incentives to appeal to out-of-district donors. On the other hand, most individuals, too, live in lopsided districts, giving them little meaningful voice in their district's general election. Faced with lopsided home-district elections, individuals give to out-of-district candidates. If drawn to reflect state-wide preferences, districts would be, on average, more competitive, incentivizing candidates to appeal to a more moderate median voter. Moreover, when living in more competitive districts, individuals substitute their giving more to within-district, endogenously reducing candidate rewards for appealing to extreme, out-of-district donors.

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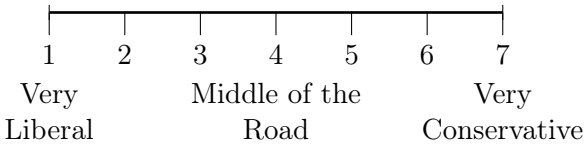
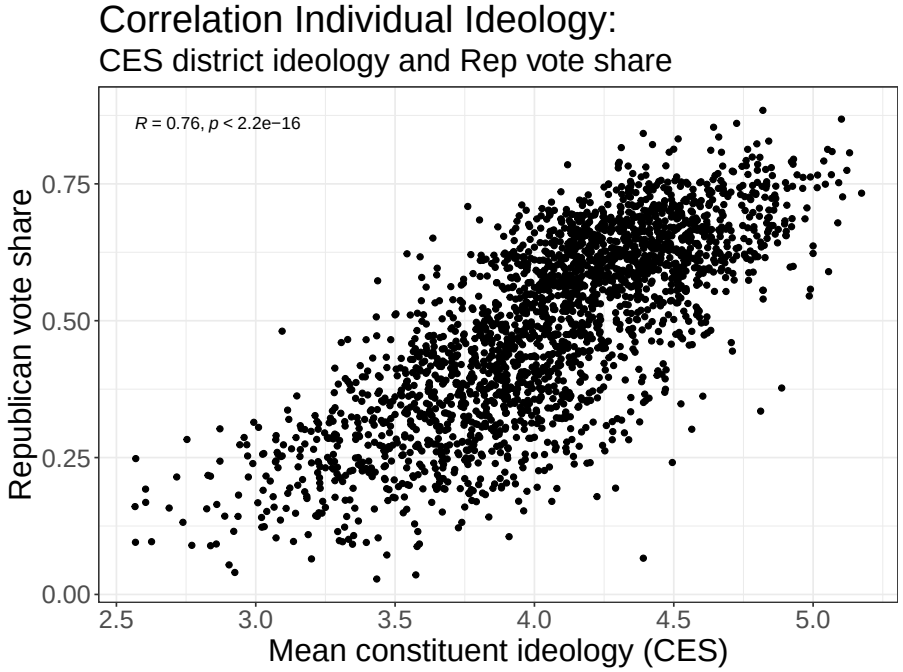
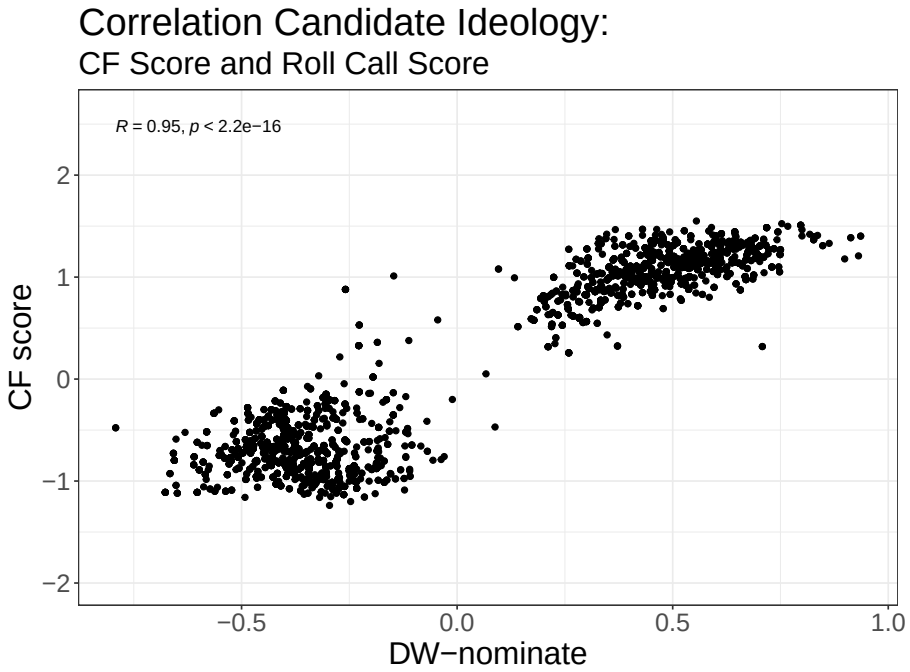


Figure 1: CES seven-point ideology scale

Note: CES respondents rank themselves and their candidates on a seven-point scale, where 1 is "Very Liberal" and 7 is "Very Conservative". "Middle of the Road" is 4.



(a) Individual ideology measure correlation



(b) Candidate ideology measure correlation

Figure 2: Validating cfscore measure

The top figure depicts the correlation between a district's mean constituent CES ideology and the district's Republican vote share in the most recent presidential election. The bottom panel depicts the correlation between two measures of House candidate ideology: DW-nominate, based on roll call scores, and CF score, which is based on a spatial model of donors.

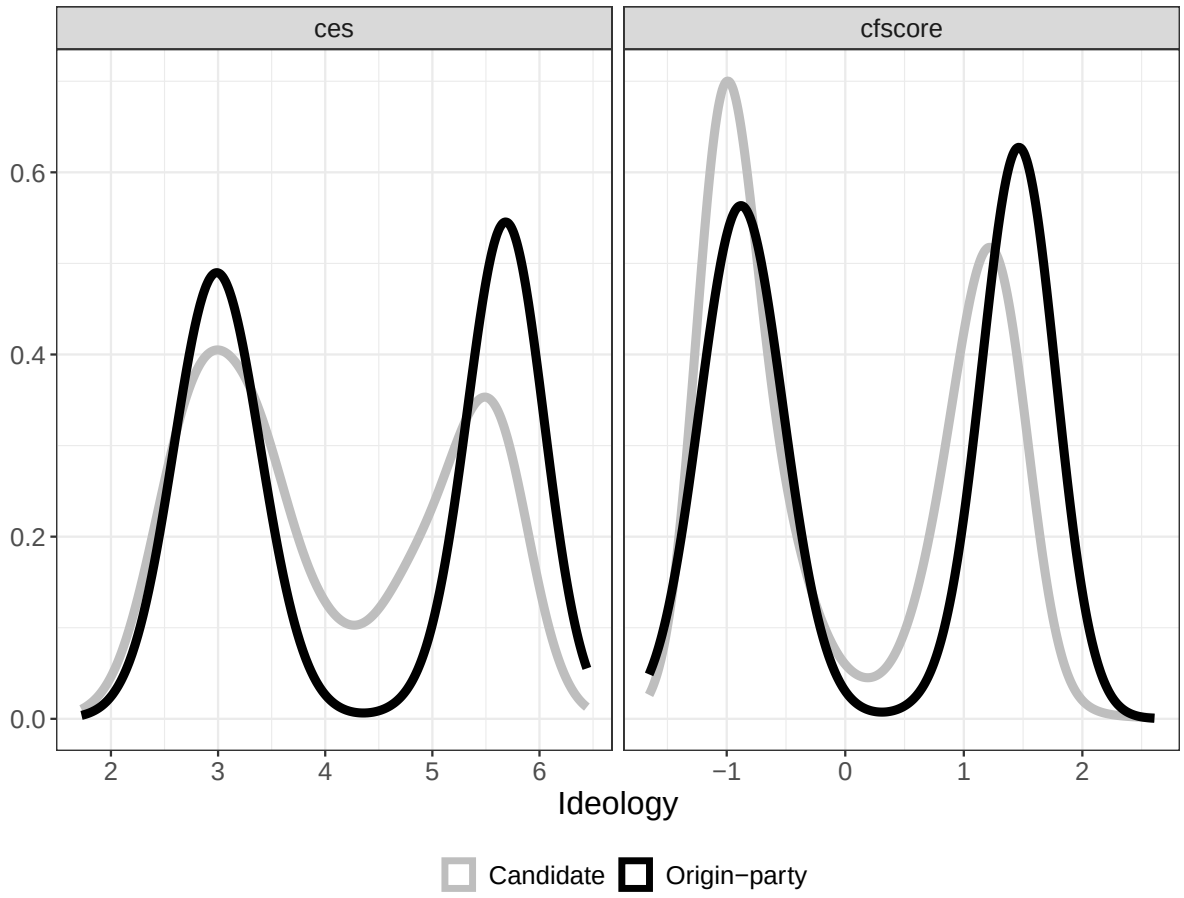


Figure 3: Ideological distributions of candidates, origin-parties

The left panel plots candidate and average origin-party ideologies as measured using the CES. The right panel plots candidate cfscores and average origin party CES ideology scaled into cfscore.

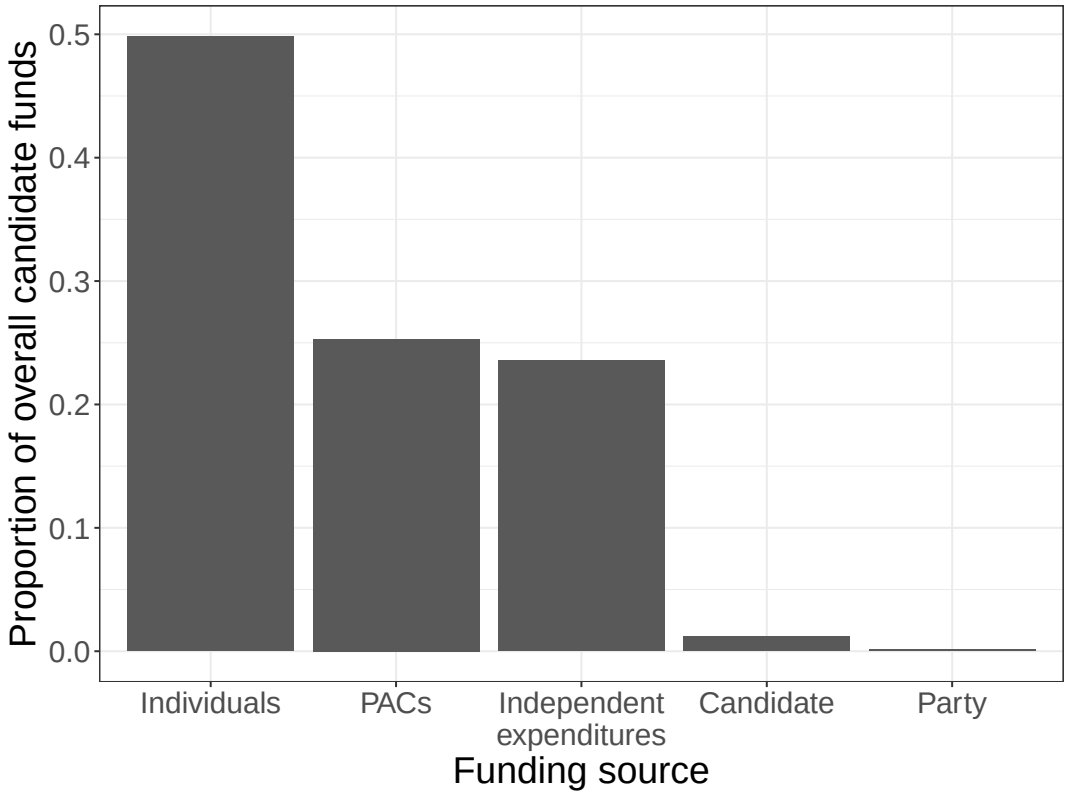


Figure 4: House candidate funding sources

Note: This figure depicts the proportion of House candidate funding from five sources: individual donors, PACs, independent expenditures, candidates, and parties.

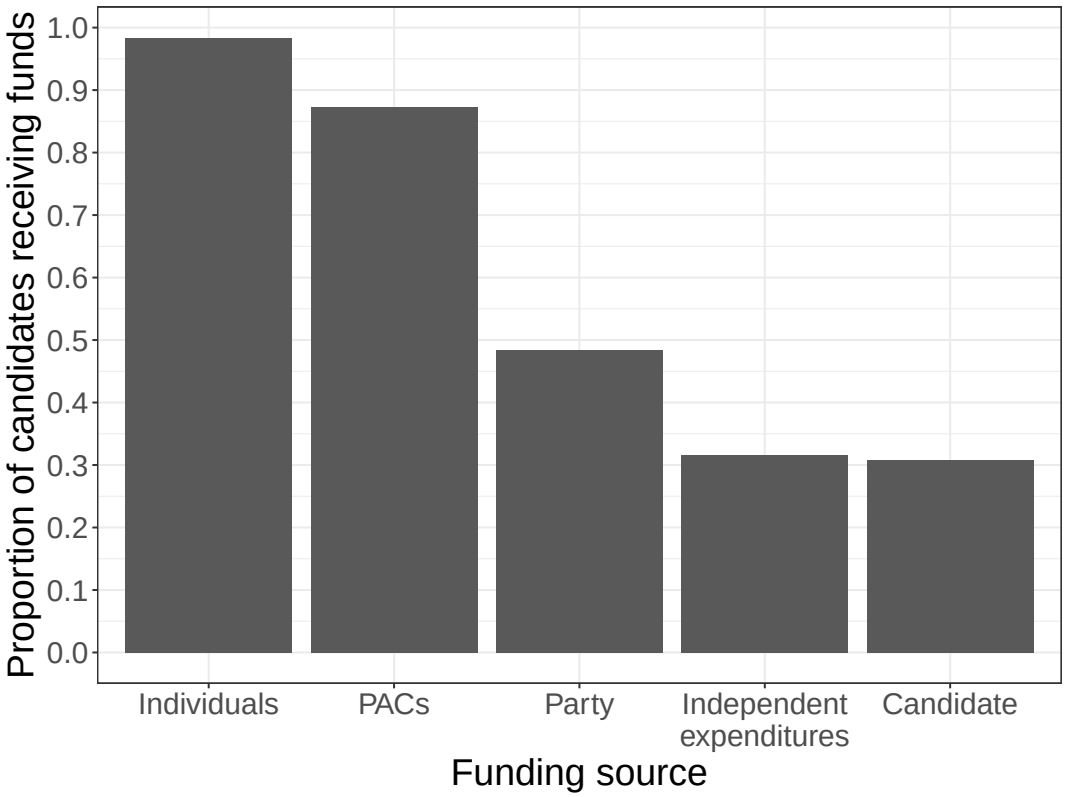


Figure 5: Proportion of House candidates receiving funding from various sources

Note: This figure depicts the proportion of House candidates receiving funding (or receiving expenditures on behalf of) from five sources of funding: individual donors, PACs, party committees, independent expenditures, and candidates.

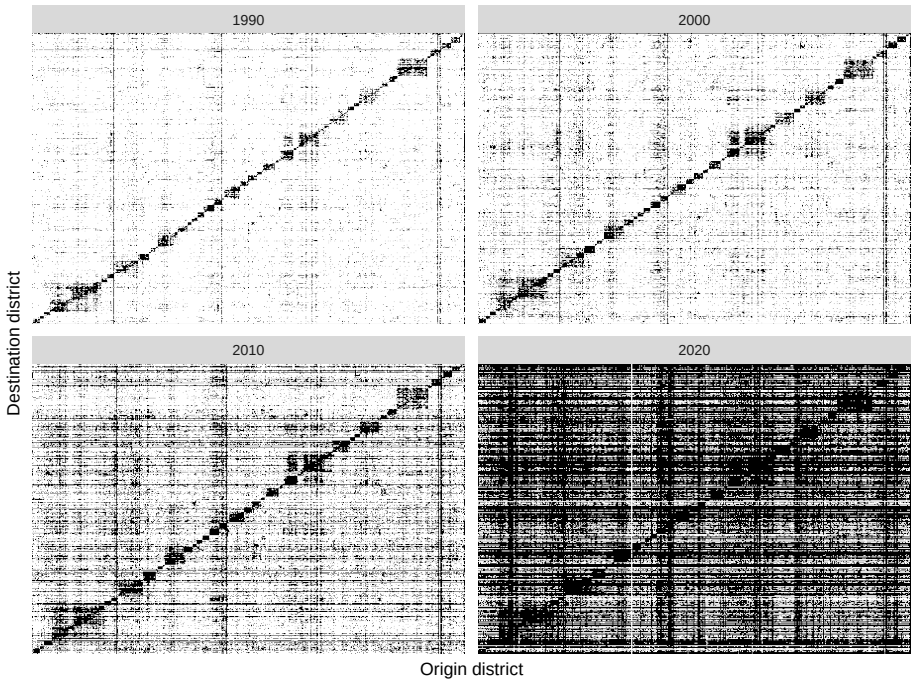


Figure 6: Rise in out-of-district donations

Note: This figure uses four election cycles of data from the Federal Election Commission. For each decade's election cycle, I create an origin-by-destination data set of the individual donation amounts from an origin congressional district (x-axis) to a destination congressional district (y-axis). The figure shows whether any individual donation was sent from an origin to a destination with a black square. Within-district giving is depicted with dark along the diagonal, and the figure is block diagonal in states.

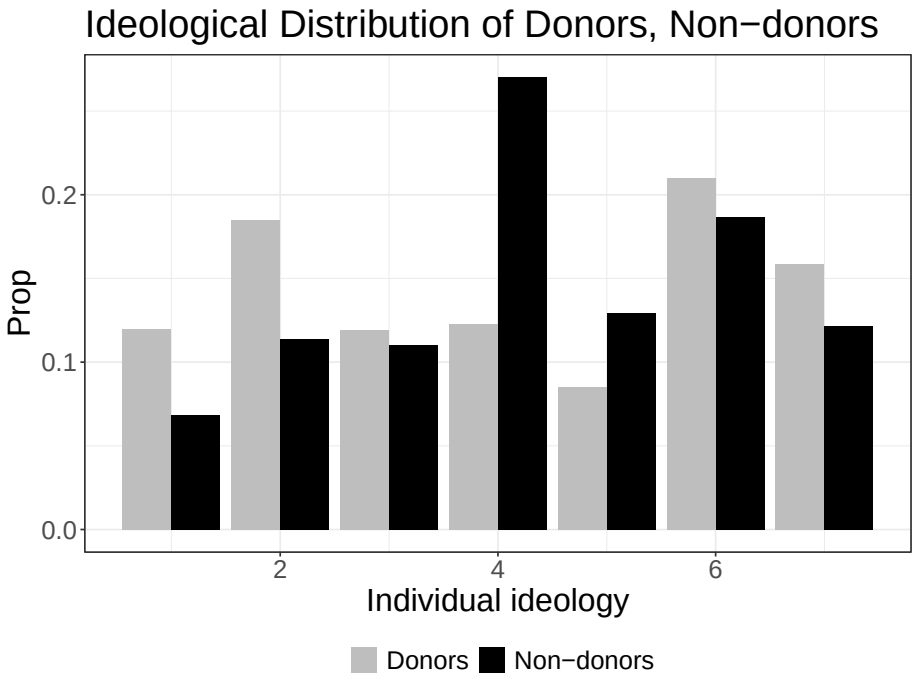


Figure 7: Ideological voters, donors

Note: This figure plots the proportion of donors, non-donors for each self-reported ideology in the 2012 CES survey.

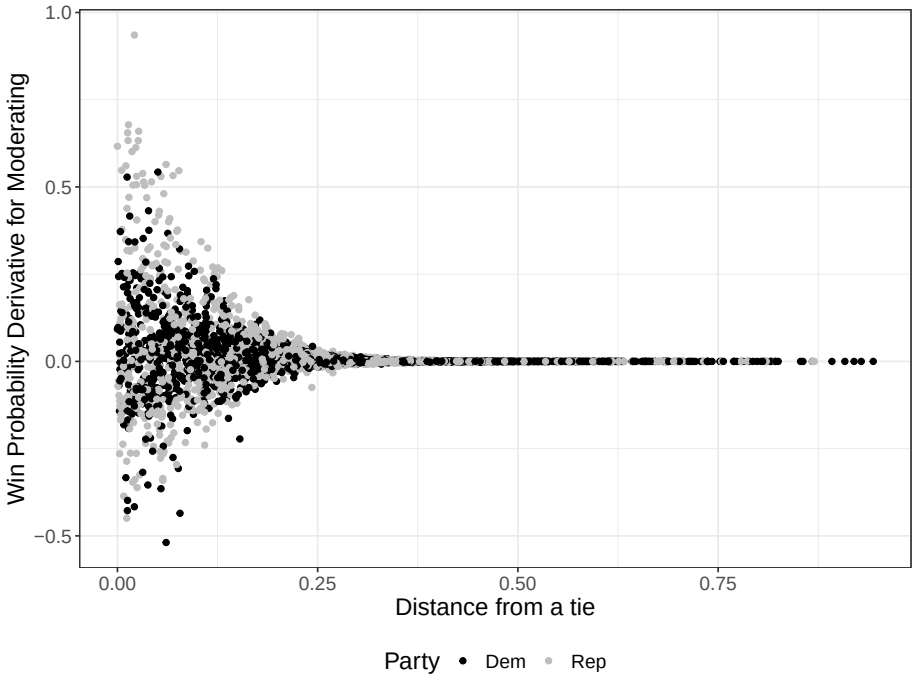


Figure 8: Candidate win probability derivatives for moderating

In general, Candidates could gain win probability by moderating. Candidates in competitive elections have the most to gain by moderating. The figure shows win probability derivatives plotted on general election two-party vote share difference for all candidates who stood for House general elections between 2012 and 2020.

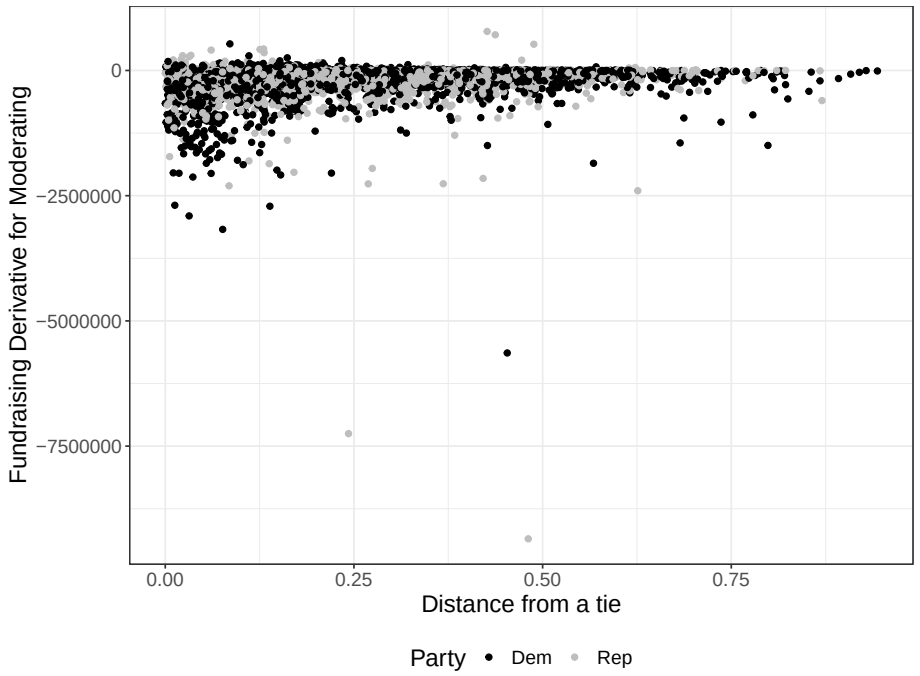


Figure 9: Candidate fundraising derivatives for moderating

In general, candidates would lose fundraising by moderating. The figure shows fundraising derivatives plotted on general election two-party vote share difference for all candidates who stood for House general elections between 2012 and 2020.

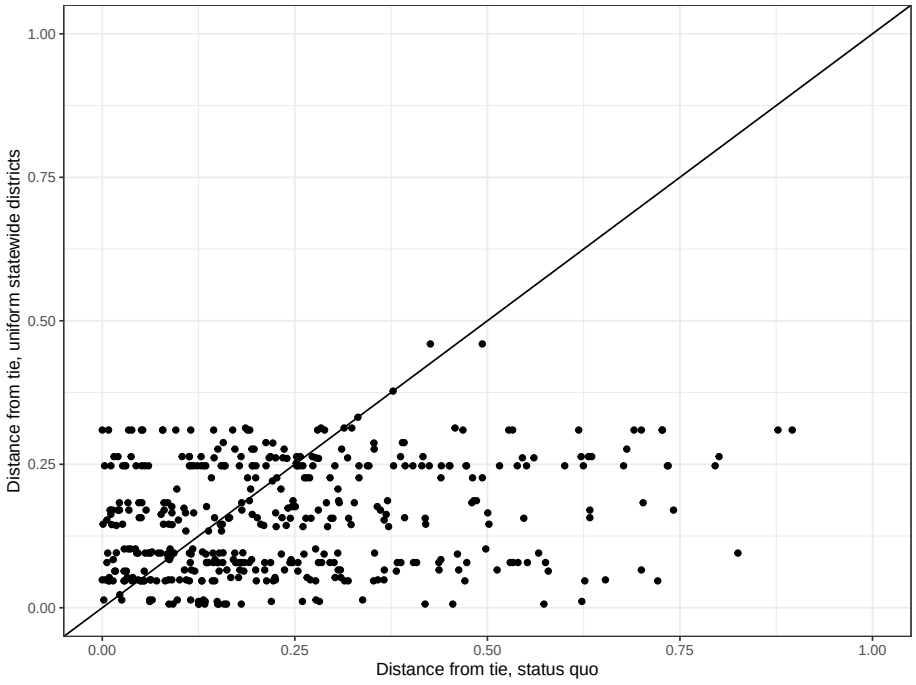


Figure 10: Statewide uniform districts district two-party difference

Note: This figure plots districts' two-party differences before and after the "statewide uniform districts" counterfactual.

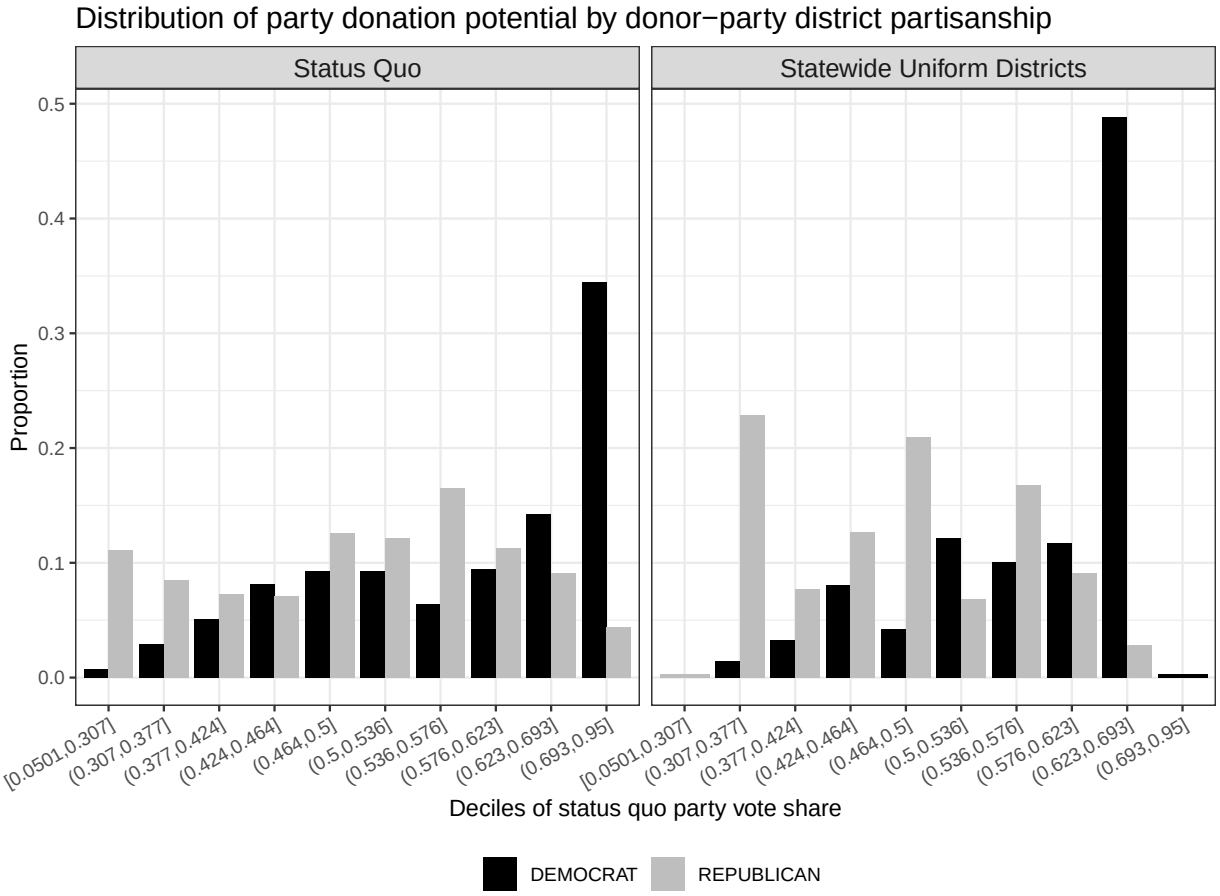


Figure 11: Potential donor dollars across types of districts

Note: This figure shows the distribution of potential donation dollars by party across partisan origin districts. The left panel shows the status quo 2018 distribution of potential donation dollars, by party in deciles of origin district partisanship. The right panel depicts the distribution across the same decile groupings in a counterfactual where districts are drawn to reflect statewide political preferences.

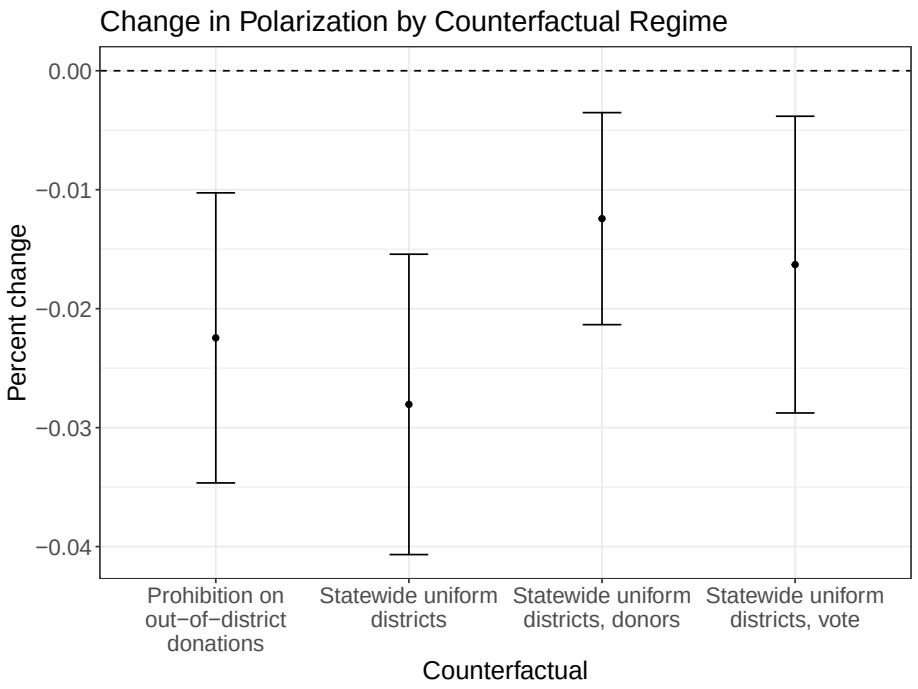


Figure 12: Polarization reduction by regime

Note: This figure shows the polarization reduction across three counterfactual regimes. Standard errors are calculated from 100 bootstrap replications.

Table 1: Funding source preference for extremenesss

	Dependent variable:				
	Indiv	PAC	Party	Indep expen.	Cands
	(1)	(2)	(3)	(4)	(5)
Ideological extreme	361,975.70***	−131,014.90***	−402.56	−203,325.70***	−8,212.84
	(96,381.79)	(22,383.14)	(431.27)	(68,380.71)	(12,330.99)
Lopsidedness	−17,797.44***	−6,275.28***	−65.91***	−15,059.30***	−447.52**
	(1,707.98)	(396.65)	(7.64)	(1,211.77)	(218.52)
Incumbent	473,759.10***	692,829.20***	−1,060.01***	−197,556.30***	−24,597.60***
	(60,910.77)	(14,145.56)	(272.55)	(43,214.82)	(7,792.87)
Open seat	357,485.80***	143,037.70***	729.39	−35,254.66	61,268.23***
	(117,742.90)	(27,343.93)	(526.86)	(83,535.95)	(15,063.92)
Observations	3,126	3,126	3,126	3,126	3,126

Note: Regressions estimated on a sample of primary election winners between 2010 and 2020. Ideological extremeness is calculated as the absolute value of a candidate's cfscore. Lopsidedness is the candidate district's two party vote percent difference in the 2008 presidential election. The value ranges from 0 to 90; larger values indicate a more lopsided district. Incumbent and open seat are indicator variables equal to 1 if the candidate is either an incumbent or running in an open seat. The reference group is challengers.

Table 2: Candidates have polarized beyond primary constituent preferences

	Dependent variable:		
	Cand ideology (s.d.)		Extremeness (s.d.)
	(1)	(2)	(3)
Primary pref (s.d.)	0.212***	0.029	
	(0.026)	(0.025)	
Cycle x Dem	−0.005*	−0.008***	
	(0.003)	(0.002)	
Cycle x Rep	0.015***	0.014***	
	(0.003)	(0.002)	
Folded primary pref (s.d.)			0.004
			(0.019)
Cycle			0.037***
			(0.004)
Party FE	✓		
CD-party FE		✓	✓
Observations	3,128	3,128	3,128
R^2	0.921	0.977	0.795

Note: Estimated on the sample of candidates between 2012 and 2020. The dependent variable in columns (1) and (2) is the normalized candidate cfscore. Extremeness, the dependent variable in Column (3), is the absolute value of cfscore. Primary preferences and folded primary preferences are also expressed in terms of standard deviations from the mean. Primary pref is the average ideology of the candidate's same-party constituents, rescaled to be on the same scale as the candidates. Folded primary pref is the absolute value of the measure. Cycle × Party are party-specific time trends, where the variable Cycle is a numeric variable that ranges from 2012 to 2020.

Table 3: Voters prefer ideologically proximate candidates

	Dependent variable:	
	Voted	
	(1)	(2)
Squared ideological distance	-0.021^{***}	-0.041^{***}
	(0.0002)	(0.0002)
Individual ideological extremeness		0.125^{***}
		(0.001)
Same party	0.380^{***}	0.289^{***}
	(0.002)	(0.002)
Candidate-election cycle FE	✓	✓
Observations	390,646	390,646
R^2	0.307	0.345

Note: This regression uses data from the 2010 through 2020 waves of the Cooperative Election Survey study. I regress an indicator of whether an individual voted for her party-affiliated candidate on the squared ideological distance between her and her party-affiliated candidate. In the second column, I include a control for an individual's ideological extremeness, measured as the absolute value of her ideology.

Table 4: Donors prefer ideologically-close candidates

	Dependent variable:	
	Total amount from origin to candidate	
	(1)	(2)
Squared ideological distance	$-6{,}437.000^{***}$	$-17{,}431.780^{***}$
	(712.293)	(906.107)
Candidate CD-origin-party FE	✓	
Candidate-cycle FE		✓
Origin-party-cycle FE		✓
Observations	270,347	270,347
R^2	0.732	0.054

Note: The sample includes all origin-by-destination-party individual donation amounts between 2012 and 2020. The dependent variable is the donation amount from an origin-party to a destination candidate in a year. The independent variable of interest is the squared ideological distance between the destination candidate and the origin-party (both on the cfscore scale).

Table 5: Voting model results

	Estimate
Squared ideological distance	-0.194
	(0.003)
Ideological extremeness	0.285
	(0.006)
Same party	1.652
	(0.014)
σ	0.0596
Money (millions)	0.101

Note: θ^v is estimated using data on 243,783 individuals' ideologies and reported vote choice between 2010 to 2022. σ is estimated using poll data and ex-post election results from 2018. The ad efficacy parameter is calibrated so that a vote costs \$120, as in Gerber (1998). Standard errors for parameters in θ^v are clustered at the district-election cycle level.

Table 6: Donor model results

	Dependent variable:					
	$\log(s_{jopt}) - \log(s_{0opt})$					
	(1)	(2)	(3)	(4)	(5)	(6)
Squared ideological distance	-0.168^{***}	-0.029^{***}	-0.278^{***}	-0.464^{***}	-0.423^{***}	-0.423^{***}
	(0.007)	(0.009)	(0.008)	(0.016)	(0.015)	(0.015)
Within district					4.298^{***}	5.094^{***}
					(0.021)	(0.057)
Lopsidedness						-0.393^{***}
						(0.084)
Within district x lopsidedness						-2.110^{***}
						(0.141)
Constant	-6.579^{***}					
	(0.003)					
Origin-party-cycle FE		✓		✓	✓	✓
Candidate FE			✓	✓	✓	✓
Observations	318,621	318,621	318,621	318,621	318,621	318,621
R^2	0.002	0.262	0.144	0.339	0.419	0.419

Note: This table presents the parameter estimates for the donor utility model. Column (1) has no fixed effects, Column (2) includes origin-party-year fixed effects, and Column (3) includes candidate fixed effects. Columns (4) and (5) include origin-party-cycle and candidate fixed effects. Relative to Column (4), Column (5) includes a control for within-district. Column (6) has additional controls for election lopsidedness and allows the preference for election lopsidedness to differ depending on whether the election is within district.

Table 7: Candidate ideology decision

	Dependent variable:					
	Candidate ideology (cfscore)					
	(1)	(2)	(3)	(4)	(5)	(6)
Win prob derivative	0.393***	0.224**	0.203**	0.166	0.502	0.508**
	(0.101)	(0.095)	(0.100)	(0.132)	(0.317)	(0.208)
Donation derivative	0.107***	0.130***	0.115***	0.134***	0.242***	0.088*
	(0.028)	(0.028)	(0.031)	(0.041)	(0.079)	(0.049)
Sample	Full	Full	Less than 20 p.p.	Less than 10 p.p.	Rare primary	No primary
Controls		✓	✓	✓	✓	✓
Party-cycle FE	✓	✓	✓	✓	✓	✓
Cragg-donald F	640	620	469	241	53	183
Observations	2,502	2,502	1,584	890	587	1,103

Note: These estimates come from a sample of candidates between 2012 and 2020. Cragg-donald first stage f-statistics are reported in the table. Standard errors are calculated from 100 bootstrap replications, and thus take into account estimation error from the demand parameters.

Appendices

Table A1: Funding source preference for extremeness

	Dependent variable:				
	Indiv	PAC	Party	Indep expen.	Cands
	(1)	(2)	(3)	(4)	(5)
Ideological extreme	864,828.20***	30,152.34*	1,068.88***	309,705.10***	37,489.74***
	(69,472.68)	(16,574.44)	(317.25)	(50,151.34)	(9,061.80)
Lopsidedness	−13,291.54***	−5,920.80***	−59.17***	−12,988.14***	−219.35
	(1,713.58)	(408.82)	(7.83)	(1,237.01)	(223.51)
Incumbent	30,135.88	700,171.80***	−1,473.34***	−303,549.10***	−40,032.32***
	(65,485.94)	(15,623.31)	(299.04)	(47,273.37)	(8,541.78)
Open seat	220,510.40*	149,417.60***	626.10	−58,448.17	57,186.97***
	(115,279.80)	(27,502.87)	(526.43)	(83,218.83)	(15,036.73)
Observations	3,126	3,126	3,126	3,126	3,126

Note: Regressions estimated on a sample of primary winners between 2010 and 2020. Ideological extremeness is calculated as the absolute value of the difference between a candidate's ideology from the CES and 4, or a middle of the road ideology. Lopsidedness is the candidate district's two party vote percent difference in the 2008 presidential election. The value ranges from 0 to 90; larger values indicate a more lopsided district. Incumbent and open seat are indicator variables equal to 1 if the candidate is either an incumbent or running in an open seat. The reference group is challengers.

Table A2: Donors prefer ideologically-close candidates (CES)

	Dependent variable:	
	Total amount from origin to candidate	
	(1)	(2)
Squared ideological distance	−4,709.670***	−6,443.467***
	(340.088)	(424.636)
Candidate CD-party FE	✓	
Candidate-cycle FE		✓
Origin-party-cycle FE	✓	✓
Observations	270,243	270,243
R^2	0.045	0.054

Note: The sample includes all origin-by-destination-party individual donation amounts between 2012 and 2020. The dependent variable is the donation amount from an origin-party to a destination candidate in a year. The independent variable of interest is the squared ideological distance between the destination candidate and the origin-party. Candidate ideology is measured using the CES survey data. The origin-party's ideology is the average ideology calculated from the CES, and the origin-party's ideological extremeness is its distance from 4.

Table A3: Donor model robustness

	Dependent variable:				
	$\log(s_{jopt}) - \log(s_{0opt})$				
	(1)	(2)	(3)	(4)	(5)
Squared ideological distance (CES)	-0.171^{***}				
	(0.009)				
Within district	5.091^{***}		3.246^{***}	5.104^{***}	3.462^{***}
	(0.057)		(0.065)	(0.056)	(0.055)
Squared ideological distance (cfscore)		-0.760^{***}	-0.469^{***}	-0.504^{***}	-0.431^{***}
		(0.023)	(0.044)	(0.016)	(0.018)
Mean within state		4.906^{***}			
		(0.051)			
Lopsidedness	-0.396^{***}	-0.739^{***}	-0.408^{**}		
	(0.084)	(0.137)	(0.208)		
Facebook connectedness index					0.000^{***}
					(0.000)
Within state					1.838^{***}
					(0.008)
Geographic distance					-0.005^{***}
					(0.0002)
Within district x lopsidedness	-2.111^{***}		-1.367^{***}	-2.103^{***}	-1.931^{***}
	(0.141)		(0.161)	(0.139)	(0.134)
Mean within state x lopsidedness		-0.973^{***}			
		(0.127)			
Origin-party-cycle FE	✓		✓	✓	✓
Origin state-party-cycle FE		✓			
Candidate FE	✓	✓	✓		
Candidate-cycle FE				✓	✓
Ideology measure	CES	cfscore	cfscore	cfscore	cfscore
Sample	All	-	Within-state	All	2012-2020
Observations	318,516	87,777	49,542	318,516	253,238
R^2	0.418	0.625	0.604	0.441	0.575

Note: This table presents a variety of robustness checks for the donor model. The first column presents estimates using a different measure of candidate and origin-party ideology ideology coming from the CES. The second and third columns shows the estimates coming from two different aggregations of the data. In Column (2), the data are aggregated to the origin state-party-by-candidate level. In Column (3), the estimation sample is origin and candidate congressional district pairs that are in the same state. Column (4) includes candidate-cycle fixed effects. Column (5) includes additional controls: geographic distance between origin and destination, Facebook's Social Connectedness Index between origin and destination, and an indicator for whether the origin and destination are in the same state.

Table A4: Advertising parameter robustness

	Dependent variable:	
	Candidate ideology (cfscore)	
	(1)	(2)
Win prob derivative	0.249***	
	(0.095)	
Win prob derivative (Levitt)		0.091
		(0.096)
Win prob derivative (Three times cheaper)	0.147***	0.108***
	(0.030)	(0.034)
Sample	Full	Full
Cragg-donald F	496	603
Observations	2,502	2,502

Note: This table presents supply parameter robustness to the advertising efficacy parameter. The first column presents the baseline results, which calibrates advertising efficacy according to the estimate in (Gerber, 1998). Column (2) uses the advertising efficacy parameter from (Levitt, 1994). Column (3) calibrates advertising to be nine times more effective than the estimate in (Levitt, 1994) and three times more effective than the estimate in (Gerber, 1998).