Unemployment and Forward-Looking Congressmen

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Abstract

Members of the US House of Representatives serve nearly four terms on average. Because their political positions are costly to change, candidates anticipate future elections and weigh how today's position choices shape their future prospects. A political stance that helps win the current election may turn into a liability in the next one. To study this intertemporal trade-off, I develop a dynamic model of electoral competition in which two candidates compete for a seat in the House. A candidate's electoral prospects depend on the position of the median voter in his district and the state of the district's economy. Both variables evolve over time, and candidates anticipate future ideological shifts and economic changes when choosing their current positions. I calibrate the model using district-level data and focus on unemployment as a proxy for economic conditions. Higher unemployment affects electoral competition by reducing incumbents' chances of reelection, incentivizing them to move toward the median voter. Through the lens of my model, I find that economic conditions were three times more important than ideological shifts in explaining the 2010 Republican wave. Absent the Great Recession, Democrats would have lost only eight seats.

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1 Introduction

Candidates in the US House of Representatives position themselves within an ideological space and these political positions, once established, are difficult and costly to change. For example, it would be hard to imagine Congresswoman Alexandria Ocasio-Cortez or Congressman Jim Jordan credibly presenting themselves as moderates in future elections. House members have incentives to serve for several cycles to build seniority, secure committee assignments, and advance legislation, and as a result, they serve nearly four terms on average. It is therefore natural to think that candidates, when choosing their political positions, look beyond the current election and anticipate how these choices will affect their prospects two or three electoral cycles ahead. Yet this forward-looking aspect of electoral competition remains understudied. In this paper, I model congressional candidates as forward-looking agents and use this framework to study how unemployment influences the House. The structural model allows me to isolate the effect of unemployment, taking into consideration politicians' endogenous responses to both current and expected future economic and political conditions.

I introduce a dynamic game of electoral competition in which two candidates in a congressional district compete every two years for a seat in the House of Representatives. Electoral prospects depend on two variables at the district level: the position of the median voter and the state of the economy. Two key features make the dynamics interesting. First, voters dislike candidates who shift their positions too sharply from one election to the next. This introduces an adjustment cost in terms of probability of winning and generates persistence in ideological positions. Second, the median voter's position and the state of the economy evolve over time. Candidates choose the policy position that best balances current and future electoral prospects. In this way, the positions chosen today arise endogenously as a result of electoral competition, current economic and political conditions, and the expectation of these conditions in the future.

Candidates have a favorite position and, in addition to the intertemporal trade-off outlined earlier, they balance the position of the median voter against their own favorite position. The incumbent candidate has a higher chance of being elected and can therefore afford to deviate more from the median voter than the challenger. When economic conditions are favorable, electoral competition is less pressing for the incumbent, reinforcing this effect. In contrast, when economic conditions are unfavorable, the incumbent faces stronger competition and has incentives to follow the median voter. In response, the challenger can afford to deviate more. Because the position of the median voter is typically moderate, unfavorable economic conditions are associated with incumbent moderation.

To connect the model to the data, I proxy the position of the median voter by the district's vote share going toward the Republican presidential nominee, and local economic conditions by the unemployment rate at the congressional district level from the

American Community Survey (ACS). In the empirical analysis, I show that unemployment is correlated with lower incumbent vote share and with lower re-election chances in competitive seats, as classified by the Cook Political Report. These two facts are consistent with the negative correlation between the nationwide unemployment rate and the number of incumbents in the US House of Representatives, of -0.35. Furthermore, those who remain in Congress have, on average, a more moderate policy position. To see this, I show that unemployment is associated with moderation, as measured by candidates' Campaign Finance ideological scores (CFscores) developed by Bonica (2014). Together, these results suggest there are two mechanisms through which unemployment reshapes congressional ideology: a composition effect, as higher unemployment increases turnover, and a moderation effect as incumbents who remain in office are more moderate.

I calibrate the model to match the proportion of incumbents in the House over the past three decades, as well as correlations between candidates' CFscores and variables at the congressional district level. I use the correlation between CFscores and the district's presidential vote share going to the Republican nominee to calibrate candidates' sensitivity to the median voter's position, and the correlation between CFscores and district unemployment to discipline their responsiveness to economic conditions. The autocorrelation of CFscores informs how strongly voters punish candidates' movements. Finally, the gap between CFscores of the two main candidates averaged across districts disciplines how much candidates deviate from their favorite positions. The predicted probabilities that a Republican candidate wins the election in a given year capture the observed partisan geography in the US: Republican strength across the Plains and South, and Democratic dominance among the coasts and major metropolitan areas.

After the Republican wave of the 2010 midterm elections, the Republican Party increased its seat count by 64 seats, the largest increase over the past few decades. I use my model to isolate how much of this Republican swing was due to higher unemployment during the Great Recession, net of voters' ideological changes. I find that the Great Recession alone was the most important channel, explaining most of the seat change. Absent the spike in unemployment, the seat change would have been only eight seats. I recalibrate the model to make Republicans benefit from the spike in unemployment and better quantify how much they benefited from the bad economic conditions. Relative to the benchmark calibration, Republican incumbents saw an increase of 17 percentage points in their chances of winning.

In a pioneering article, Kramer (1971) introduced the idea that aggregate economic fluctuations influence congressional elections, with economic upturn helping the incumbent party, and economic decline benefiting the opposition party. More recently, Feigenbaum and Hall (2015) find that exposure to import competition led districts to shift toward Republicans and pushed House representatives toward more protectionist positions, and Autor, Dorn, Hanson, and Majlesi (2020) use exogenous variation in trade exposure to argue that it increases polarization while increasing the likelihood that a Republican member wins. Most papers linking local unemployment to electoral outcomes focus on presidential elections. Burden and Wichowsky (2014) show that county level unemployment is associated with voter turnout, and that Republican candidates are especially harmed. Finally Park and Reeves (2020) link unemployment to lower support for the incumbent, with asymmetric effects between Democratic candidates and Republican candidates. I contribute to the literature by first, studying the relation between local level unemployment and congressional election outcomes and second, explicitly taking into account that forward-looking candidates will endogenously respond to local economic shocks.

Forward-looking behavior is central to understanding ideological dynamics in Congress. DeBacker (2015) shows that senators face significant electoral costs when changing positions and because these costs are increasing, senators prefer to make small adjustments distributed over time. Focusing on state legislatures with term limits, Fouirnaies and Hall (2022) find that legislators who can no longer seek reelection are, on average, less productive. This study suggests that future electoral incentives play an important role in legislative behavior. Cox and Shapiro (2025) argue that policy positions of House members are influenced by the committee assignments decided by the parties, and suggest that promotions and post-congressional career outcomes affect positions as well, something that was also highlighted by Diermeier, Keane, and Merlo (2005). My contribution is to integrate economic shocks into a forward-looking model of ideological adjustment, showing how unemployment shapes legislators' positions through current and future electoral incentives. The closest theoretical framework is Gersbach, Jackson, Muller, and Tejada (2023), who model candidates facing costly policy adjustments, but they abstract from economic shocks.

The remainder of this paper is organized as follows. After this introduction, Section (2) presents the empirical evidence. Next, Sections (3) and (4) introduce the model and the benchmark calibration, respectively. Finally, Section (5) describes the counterfactual and recalibration exercises, and Section (6) concludes.

2 Empirical Results

I study two channels through which unemployment affects Congress. The first is a composition channel, which I analyze by relating unemployment to incumbents' vote share, re-election probability, and replacement hazard after a district realignment. The second is a moderation channel, which I study by examining whether higher unemployment leads surviving incumbents to adopt more moderate ideological positions.

2.1 Data

I measure unemployment at the congressional-district level using the American Community Survey (ACS) from 2010 onward. I use 1-year estimates. To extend the data before 2010, I use state unemployment rates from the BLS Local Area Unemployment Statistics (LAUS) program. From the BEA I obtain nominal and real GDP at the state level. I proxy the state-level inflation with the BEA's Implicit Regional Price Deflator, which combines Regional Price Parities with the national PCE price index.

A comprehensive full series of turnout rates by congressional district is not available across years. While district-level House vote totals are publicly available, corresponding citizen voting-age population by district is available only for more recent years. To work around this limitation, I use state-level turnout rates as a proxy for district turnout (i.e. assuming each district within a state has the same average turnout).

For candidate positions, I use ideology scores based on contributor networks from the Dataset on Ideology and Money in Politics (DIME) Bonica (2014), which places candidates along an ideological scale. It has been shown that these measures have a positive correlation with more traditional measures of ideology based on roll-call voting in Congress Poole (2005). DIME ideology measures have two advantages that will prove useful for my analysis later. First, they are available for both incumbents and challengers, which is useful information for my model. Second, they are constructed prior to the election rather than retrospectively after the cycle. This timing aligns better with the framework I have in mind, since voters make their choices based on candidates' positions at the moment of the election. Thus, the scores capture the relevant ideological signals at the time when they matter most.

2.2 Correlation Between Unemployment and Incumbent Vote Share

I estimate the following specification for incumbents to analyze the correlation between unemployment ($\mathrm{ur}_{i,t}$) and the incumbent's vote share ($s_{i,t}$).

$$s_{i,t} = \beta_0 + \beta_1 \mathrm{ur}_{i,t} + X_{i,t}\gamma + \alpha_t + \alpha_i + \varepsilon_{i,t} \tag{1}$$

Controls include: The most recent district presidential vote share going to the GOP presidential nominee interacted with party, a candidate party dummy, the logarithm of total receipts, the logarithm of the number of donors, candidate's current CFscore interacted with party, real GDP growth at the state level, and inflation at the state level. I include time effects, tenure dummies, and an individual fixed effect.

Table (1) shows the results. Unemployment is scaled so that the associated coefficient represents the fall in the vote share from a 1-SD increase in unemployment. The first column presents the correlation controlling for political variables only. In the second and third columns, I add a time effect and controls. Finally, the fourth column includes an individual fixed effect. The estimated coefficient is negative across the four specifications, but it is insignificant in the last column due to a lack of statistical power.

Table 1: Candidates' Vote Share on District Unemployment

	Dependent variable:			
	Vote Share (pp)			
	(1)	(2)	(3)	(4)
Unemployment rate (std.)	-1.660^{***}	-0.646^{**}	-0.558^{**}	-0.284
	(0.183)	(0.275)	(0.268)	(0.501)
District Pres. VS	-0.427^{***}	-0.369^{***}	-0.295^{***}	-0.359^{***}
	(0.024)	(0.023)	(0.026)	(0.077)
District Pres. VS x GOP	0.594^{***}	0.577^{***}	0.391^{***}	0.293^{***}
	(0.039)	(0.039)	(0.047)	(0.100)
GOP dummy	-26.337^{***}	-27.027^{***}	-18.445^{***}	
	(1.956)	(1.982)	(2.446)	
CS			0.041	-3.884
			(1.519)	(4.538)
CFscore			-4.254^{***}	-2.579^{***}
			(0.430)	(0.484)
CFscore x GOP			0.402	-0.896
			(0.986)	(3.301)
Log total receipts			-1.749^{**}	-2.231^{**}
			(0.741)	(1.036)
Log number of givers			1.608^{**}	0.281
			(0.650)	(0.825)
rGDP growth			-0.969^{***}	-0.421
			(0.244)	(0.354)
Inflation			1.175^{***}	-0.160
			(0.325)	(0.416)
Constant	46.671^{***}	40.424^{***}	53.020^{***}	43.578^{***}
	(0.913)	(1.067)	(7.201)	(12.913)
Cycle FE		✓	✓	✓
Tenure FE			✓	✓
Individual FE				✓
Observations	1,796	1,796	1,787	1,787
R^2	0.184	0.571	0.615	0.843
Note:				*p<0.1; **p<0.05; ***p<0.01

Note: Regressions are for incumbent House Representatives only. The unemployment rate is at the congressional district level and it was scaled. Vote share is expressed in percents. Clustered standard errors at the congressional district level in parentheses.

I conduct two robustness checks. First, I re-estimate the regressions using state-level unemployment, which allows me to extend the sample period beyond, since ACS district-level unemployment is only available from that year onward. Second, I replicate the specifications for Senate elections. This exercise shows that the negative effect of unemployment is not unique to House races, but also appears among other members of Congress. Finally, I replace vote share with the percentage of votes as the dependent variable. Because percentage of votes does not account for abstention, the coefficient is insignificant. This pattern suggests that unemployment primarily reduces support for incumbents by discouraging their voters, rather than shifting support toward challengers. These exercises are found in the appendix (A).

While higher unemployment reduces a candidate's vote share, this does not necessarily imply electoral defeat. I estimate the following linear probability model to assess the extent to which district unemployment affects the chance that a candidate is re-elected.

$$\text{Win}_{i,t} = \beta_0 + \beta_1 \text{ur}_{i,t} + \beta_2 \text{CS}_{i,t} + \beta_3 \text{CS}_{i,t} \times \text{ur}_{i,t} + X_{i,t}\gamma + \alpha_t + \alpha_i + \varepsilon_{i,t} \tag{2}$$

I use the same set of controls with the exception of one variable: competitive seat ($\text{CS}_{i,t}$), a dummy variable defined by the Cook Political Report House ratings that equals 1 when the seat is competitive. $\text{Win}_{i,t}$ is another dummy variable that equals 1 if candidate i wins the election in cycle t and equals 0 otherwise.

Table (2) presents the results. In general, unemployment does not correlate with lower chances of winning. There is indeed a negative correlation in competitive seats, as shown in the coefficient next to the interaction term[1]. These results suggest that unemployment weakens incumbents mainly when the race is already competitive. Outside of those contexts, higher unemployment has an effect on vote share, but it does not systematically reduce the probability of re-election.

As a robustness exercise, I re-estimate the model with state-level unemployment to increase the number of observations, these results are reported in the appendix (A). For Senators, however, the number of competitive seats is too limited to carry out a comparable analysis in a meaningful way.

2.3 Unemployment Weakens the Incumbency Advantage

Motivated by the finding that unemployment matters mainly in competitive races, I next focus on districts that underwent clear partisan shifts in ideology—moving from reliably Democratic to reliably Republican, or vice versa. My goal is to measure the extent to which the incumbency advantage allows incumbents to linger in districts that have shifted away from their party's traditional alignment.

[1] With individual fixed effects included, the party dummy is absorbed, so the coefficient β_3 is only identified from limited within-incumbent variation. As a result, the estimate in column (4) becomes insignificant and its sign should not be taken at face value.

Table 2: Winner Dummy on District Unemployment

	Dependent variable:			
	Winner Dummy			
	(1)	(2)	(3)	(4)
Unemployment rate (std.)	−0.015***	0.003	0.005	−0.023
	(0.004)	(0.008)	(0.008)	(0.018)
Competitive Seat	−0.293***	−0.284***	−0.308***	−0.171***
	(0.023)	(0.023)	(0.022)	(0.032)
Unemployment Rate × CS	−0.060**	−0.061**	−0.050**	0.042
	(0.025)	(0.024)	(0.024)	(0.032)
District Pres. VS	−0.004***	−0.003***	−0.004***	−0.007**
	(0.001)	(0.001)	(0.001)	(0.003)
District Pres. VS × GOP	0.007***	0.007***	0.008***	0.016***
	(0.001)	(0.001)	(0.001)	(0.005)
GOP dummy	−0.317***	−0.309***	−0.289***	
	(0.060)	(0.061)	(0.063)	
CFscore			−0.010	−0.088
			(0.035)	(0.130)
CFscore × GOP			0.059***	0.064
			(0.016)	(0.049)
Log total receipts			−0.003	−0.017
			(0.014)	(0.033)
Log number of givers			0.005	0.001
			(0.009)	(0.012)
rGDP growth			0.009	−0.002
			(0.011)	(0.014)
Inflation			−0.067	−0.165
			(0.048)	(0.190)
Constant	1.102***	1.048***	0.363**	−0.265
	(0.026)	(0.032)	(0.163)	(0.574)
Cycle FE		✓	✓	✓
Tenure FE			✓	✓
Individual FE				✓
Observations	2,167	2,167	2,153	2,153
R^2	0.270	0.278	0.311	0.749
Note:	*p<0.1; **p<0.05; ***p<0.01			

Note: Regressions are for incumbent House Representatives only. The unemployment rate is at the congressional district level and it was scaled. The dependent variable is a dummy variable that equals 1 if the candidate won the election in the given cycle. Clustered (at the congressional district level) standard errors in parentheses.

To identify these districts, I focus on the period 1984–2022 and select those where the GOP presidential vote share crosses the 50% threshold exactly once. This gives me a total of 125 congressional districts: 100 that shifted from reliably Republican to Democratic, and 25 that shifted from reliably Democratic to Republican. Once the presidential vote share crosses the 50% threshold, it takes on average 2.55 years for the incumbent House member to be replaced by a representative from the opposite party[2]. The transition is slower in districts shifting from Democratic to Republican (6.27 years on average) than in those shifting from Republican to Democratic (1.71 years on average).

Some districts never replace their House member within my sample window. To handle censoring and different exposure lengths, I estimate a discrete-time hazard of replacement by the opposite party after the 50% threshold crossing.

$$\text{logit}[h_{i,t}] = \beta_1 \Delta \text{ur}_{i,t} + X_{i,t}\gamma + \alpha_t + \alpha_{\text{R}(i)} + \alpha_{\text{D}(t)} \tag{3}$$

Where $h_{i,t} = \mathbf{Pr}[y_{i,t} = 1 | y_{i,t-1} = 0]$ models the probability that incumbent i is replaced in period t, conditional on not having been replaced in any earlier period. I use the change in state-level unemployment rate to test whether worsening economic conditions accelerate the replacement of incumbents —in other words, whether unemployment speeds up the "dying process" of an incumbent in a shifting district. Controls include the growth rate of nominal GDP at the state level, and a dummy for the type of district (Republican to Democrat or vice versa). α_t capture the baseline hazard, $\alpha_{\text{R}(i)}$ are region fixed effects (Northeast, Midwest, South, and West), and $\alpha_{\text{D}(t)}$ are decade fixed effects. The last two effects account for differences in dynamics across regions and over the past four decades.

Table (3) shows the estimation results. The first column presents a constant hazard model, and the remaining columns present its time-varying alternative without controls on the second column, with controls in the third column, and with additional fixed effects on the last column. An increase in unemployment of 1 percentage point raises the odds of a flip by 37% ($e^{0.317} - 1$) in my preferred specification. To interpret magnitudes, I compute the expected time (in years) before replacement for each subgroup in the sample, truncating at 16 years. The median expected duration across subgroups is 4.99 years under constant unemployment. If unemployment increases permanently by 0.25 percentage points per year, the median expected tenure falls to 4.64 years, a decline of roughly 4 months.

These results suggest that unemployment accelerates partisan turnover in districts that have already shifted in presidential vote share, weakening the ability of incumbents to hold on despite adverse trends. The evidence suggests that the incumbency advantage can delay, but not prevent, replacement once economic conditions worsen in a district

[2] If the incumbent is replaced at all.

Table 3: Discrete-Time Hazard for Incumbent Replacement

	Dependent variable:			
	Incumbent Replaced (event dummy)			
	(1)	(2)	(3)	(4)
ΔUnemployment rate	0.172*	0.245**	0.153	0.317*
	(0.102)	(0.124)	(0.144)	(0.189)
nGDP growth			−0.025	0.043
			(0.051)	(0.065)
Rep→Dem dummy			0.569*	0.335
			(0.345)	(0.475)
Duration FE		✓	✓	✓
Region FE				✓
Decade FE				✓
Observations	307	307	307	307
Note:	*p<0.1; **p<0.05; ***p<0.01			

Note: The dependent variable is a dummy equal to 1 if the incumbent is replaced by a candidate from the opposite party in a given cycle after the district's presidential vote share crosses the 50% threshold, and 0 otherwise. Estimates are from logit regressions; standard errors in parentheses.

that has realigned. I present the survival model results for Senators in appendix (A).

2.4 Unemployment is Associated with Moderate Positions

While the previous analysis focused on composition effects —how unemployment influences which candidates enter and leave the House—, I now examine whether the ideological position of incumbents, as measured by CFscores, is systematically associated with unemployment rates in their congressional districts. I estimate the following regression.

$$|p_{i,t}| = \beta_0 + \beta_1 \mathrm{ur}_{i,t} + X_{i,t}\gamma + \alpha_t + \alpha_i + \varepsilon_{i,t} \tag{4}$$

Where $|p_{i,t}|$ is the absolute value of candidate i's CFscore at cycle t. The higher its absolute value, the less moderate the incumbent is. The unemployment rate is at the congressional district level. Controls include inflation and real GDP growth at the state level, the district's presidential vote share going toward the GOP nominee interacted with party, a party dummy, the logarithm of total receipts, the logarithm of the number of donors, and the lagged CFscores.

Table (4) shows the results. Both unemployment and the CFscore were scaled, so unconditionally an unemployment rate that is 1-SD higher is associated with positions that are 0.301-SD lower. Including controls and individual effects reduces this correlation, but the sign is negative across specifications. These results suggest that higher unemployment

Table 4: Incumbent Moderation on District Unemployment

	Dependent variable:			
	|CFscore| (std.)			
	(1)	(2)	(3)	(4)
Unemployment rate (std.)	-0.301^{***}	-0.409^{***}	-0.014	-0.057^{*}
	(0.022)	(0.042)	(0.009)	(0.029)
Inflation (std.)			-0.011	-0.018
			(0.014)	(0.019)
rGDP growth (std.)			0.021^{**}	0.007
			(0.010)	(0.016)
District Pres. VS			0.037	0.299^{***}
			(0.026)	(0.077)
District Pres. VS × GOP			0.064^{***}	0.033
			(0.020)	(0.031)
GOP dummy			-0.065^{**}	
			(0.026)	
CS			0.065^{***}	0.066^{*}
			(0.021)	(0.040)
Log total receipts			0.911^{***}	0.357^{***}
			(0.011)	(0.042)
Log number of givers			-0.050^{***}	0.018
			(0.014)	(0.064)
|CFscore| L1			0.107^{***}	-0.116
			(0.025)	(0.079)
Constant	0.290^{***}	0.448^{***}	0.630^{*}	-0.573
	(0.033)	(0.070)	(0.342)	(0.619)
Cycle FE		✓	✓	✓
Tenure FE			✓	✓
Individual FE				✓
Observations	2,602	2,602	2,522	2,522
R^2	0.104	0.122	0.897	0.947
Note:		*p<0.1; **p<0.05; ***p<0.01		

Note: The dependent variable is the standardized absolute value of CFscores, where higher values indicate less moderation. The unemployment rate is measured at the congressional district level. Controls include state-level inflation and real GDP growth, district presidential vote share and its interaction with party, a party dummy, campaign finance variables, and the lagged CFscore. Standard errors (clustered at the congressional district level) in parentheses.

is linked to more moderate ideological positions among incumbents. On top of the composition effect highlighted by the previous empirical analysis, I see a moderation effect among those incumbents who survive.

One concern is that incumbents may react to past rather than current unemployment. To address this, I re-estimate the regressions using lagged unemployment, these results are reported in the appendix (A) and the results do not differ from those in Table (4). I also run the same specification for Senators to show that the relationship is not specific to House Representatives, and I use state-level unemployment rates to extend the sample and increase the number of observations.

3 Model

In this section, I introduce a dynamic model of electoral competition at the congressional district level. The model builds on a probabilistic voting framework, where district preferences and economic conditions evolve each period, and candidates are forward-looking as they choose policy positions to maximize the discounted sum of their future winning probabilities. Adjusting positions is costly, reflecting that candidates build reputations and cannot easily shift their stance. In each election, one candidate is an incumbent and the other a challenger, with incumbents enjoying an advantage that interacts with economic conditions. Good economic conditions make this advantage stronger, while bad economic conditions weaken it. In this way, the model captures the two effects I discussed earlier. When economic conditions worsen, incumbents become less likely to win, leading, over time, to a greater share of challengers in the House—a composition effect. In response, incumbents who typically sit to the left (or right) of their district's median voter adopt more moderate positions, so those who remain in office tend to be more centrist—a moderation effect. Candidates are infinitely lived, and in this way they represent the positions of the two main parties. To capture the fact that candidates change over time, I introduce Calvo style shocks that generate turnover and allow positions to reset when new candidates appear, by setting the adjustment cost for that period equal to zero.

In subsection (3.1), I present the one-period version of the model to illustrate the key trade-offs candidates face. Subsection (3.2) extends the framework to a repeated setting, defining the state space and the Markov-perfect equilibrium concept. Subsection (3.3) describes the model solution in more detail.

3.1 One-Period Game

The game consists of voters in a congressional district and two candidates, a Democrat (D) and a Republican (R) who compete for a seat. One of the candidates is the incumbent, who competes against a challenger. For the exposition, assume the Democrat is the incumbent, but their roles can (and will) be reversed. Voters in the district cast their votes according to a probabilistic voting model following Cox and Shapiro (2025). Each voter cares about the ideological position of the candidates and votes for the candidate who gives them the highest utility, without any strategic concern. Candidates compete by choosing their ideological positions simultaneously with the goal of maximizing an average between the probability of winning and the utility of holding office.

The probability of winning depends on who the incumbent is, the candidates' previous positions, and economic and political variables at the district level. Incumbency status is straightforward: being an incumbent gives that candidate a better chance of winning. A candidate's prior stance makes it difficult to convincingly adopt a different position. I formalize this idea by making the mean utility of voters depend on the deviation from the candidates' previous political stances. Finally, economic and political variables summarize everything that candidates find relevant about the district. In the one-period model these district variables can be thought as parameters.

Figure (1) describes the timing of the game. At the beginning of the electoral cycle, candidates observe their previous ideological stances p^{D}_{-1} and p^{R}_{-1}, the incumbency status $I \in \{0, 1\}$ (with the convention that $I = 1$ means the Democratic candidate is the incumbent), and the district's ideological and economic characteristics z^{D} and z^{E}. Then competition takes place, where candidates simultaneously choose their ideological positions $p^{\mathrm{D}} \in \mathbf{R}$ and $p^{\mathrm{R}} \in \mathbf{R}$. Finally, nature chooses a winner who gets some utility for holding office, which depends on their chosen position. The loser gets 0.

Figure 1: One-Period Game - Timing

In the reminder of this section I describe the probabilistic voting model, the candidates' period utilities, and discuss the static Nash equilibrium.

Voters

This section follows closely Cox and Shapiro (2025). Voter v's utility of voting for candidate $j \in \{\mathrm{D}, \mathrm{R}\}$ is a function of three terms: mean utility $\bar{u}_j$, candidate valence ξ_j, and idiosyncratic noise $\epsilon_{v,j}$. Abstaining gives zero mean utility.

$$\begin{cases} u_{v,j} &= \bar{u}_j + \xi_j + \epsilon_{v,j} \\ u_{v,o} &= \epsilon_{v,o} \end{cases}, \qquad \epsilon_{v,\cdot} \sim \text{T1EV} \tag{5}$$

The idiosyncratic noise has a type-I extreme value (T1EV) distribution, independent across voters and choices. Under this assumption, the probability of v voting for candidate j is a multinomial logistic function (Train (2009)). With a large number of voters, the share of votes conditional on valence shocks can be expressed as $s_j = \frac{\exp\{\bar{u}_j+\xi_j\}}{1+\sum_{k\in\{I,C\}}\exp\{\bar{u}_k+\xi_k\}}$. The candidate with the highest share wins. Let ξ_j have a T1EV distribution with the same mean for both candidates and variance normalized to 1. The probability that candidate j wins the election takes the logistic form.

$$\mathbf{Pr}[s_j > s_{-j}] = \frac{\exp\{\bar{u}_j\}}{\sum_{k\in\{\mathrm{D,R}\}}\exp\{\bar{u}_k\}} \tag{6}$$

The mean utility $\bar{u}_j$ determines the probability of winning. I allow the mean utility to depend on the ideology of the candidate, thus candidates can influence the probability of winning by adjusting their ideological position. Note that this mean utility is common across voters in the district. Let the mean district ideology be z^{D} and the district economic conditions be z^{E}. I choose the convention that $z^{\mathrm{D}} < 0$ indicates a left-leaning district, $z^{\mathrm{D}} > 0$ right-leaning, while $z^{\mathrm{E}} < 0$ signals poor economic conditions, and $z^{\mathrm{E}} > 0$ good conditions.

Voters penalize candidates who deviate from the mean district ideology and their previous stances. Parameters $\alpha_1 > 0$ and $\gamma > 0$ control how sensitive mean utility is to these deviations. Incumbency has an advantage captured by parameter $v_I > 0$, and this advantage is exacerbated when economic conditions are good ($z^{\mathrm{E}} > 0$) and hindered when they are bad ($z^{\mathrm{E}} < 0$). The parameter $\alpha_2 > 0$ controls the sensitivity to economic conditions. Finally, $\alpha_3 > 0$ captures partisan alignment. Equation (7) displays the mean utility of voting for each of the candidates, assuming the Democratic candidate is the incumbent.

$$\begin{cases} \bar{u}_{\mathrm{D}} &= -\alpha_1(p^{\mathrm{D}} - z^{\mathrm{D}})^2 - \gamma(p^{\mathrm{D}} - p^{\mathrm{D}}_{-1})^2 + (v_I + \alpha_2 z^{\mathrm{E}}) \\ \bar{u}_{\mathrm{R}} &= -\alpha_1(p^{\mathrm{R}} - z^{\mathrm{D}})^2 - \gamma(p^{\mathrm{R}} - p^{\mathrm{R}}_{-1})^2 + \alpha_3 z^{\mathrm{D}} \end{cases} \tag{7}$$

Idiosyncratic and valence shocks average out. In this way, z^{D} and z^{E} summarize everything candidates find relevant about the district.

Period Utility

Candidates set their positions to maximize the expected value of holding office. If a candidate holds office they gets $u^{j,\mathrm{O}}(p) = \exp\{-v^{\mathrm{O}}(p - p^{j,*})^2\}$ where p is their choice, $p^{j,*}$ a latent ideal position, and $v^{\mathrm{O}} > 0$. In this way $p^{j,*}$ introduces a trade-off between the position that maximizes the mean utility of voters (typically a moderate position) and the position that maximizes the candidate's utility of holding office (typically an extreme position). The probability of winning depends on the position of both candidates and parameters $s = (p^{\mathrm{D}}_{-1}, p^{\mathrm{R}}_{-1}, I, z^{\mathrm{D}}, z^{\mathrm{E}})$.

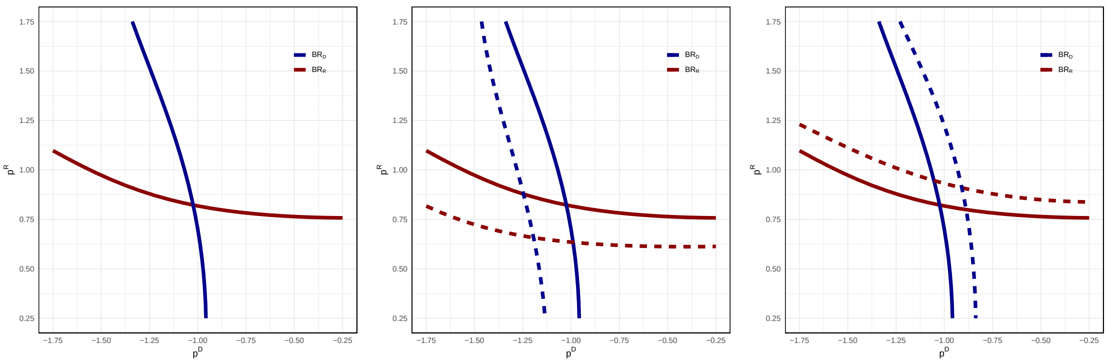
$$\begin{aligned} \mathrm{PU}^{\mathrm{D}}(p^{\mathrm{D}}, p^{\mathrm{R}}; s) &= \mathbf{Pr}^{\mathrm{D}}(p^{\mathrm{D}}, p^{\mathrm{R}}; s) \cdot \exp\{-v^{\mathrm{O}}(p^{\mathrm{D}} - p^{\mathrm{D}*})^2\} \\ \mathrm{PU}^{\mathrm{R}}(p^{\mathrm{D}}, p^{\mathrm{R}}; s) &= \mathbf{Pr}^{\mathrm{R}}(p^{\mathrm{D}}, p^{\mathrm{R}}; s) \cdot \exp\{-v^{\mathrm{O}}(p^{\mathrm{R}} - p^{\mathrm{R}*})^2\} \end{aligned} \tag{8}$$

Static Nash Equilibrium

Figure (2) shows the best responses of a Democratic incumbent and a Republican challenger. Panel (a) plots the benchmark, panel (b) a comparative static with respect to z^{D}, and panel (c) a comparative static with respect to z^{E}. The model predicts that the incumbent advantage generates relatively more extreme positions. The incumbent starts with a higher chance of winning, so deviating from the district's ideology to pursue their preferred position is less costly. If the district changes its ideology toward the left, candidates adjust in the same direction. In the Nash equilibrium both candidates are to the left of the benchmark, as seen in panel (b). If the district economic conditions worsen, this weaken the incumbency advantage, and the Democratic incumbent has incentives to become more moderate. In the Nash equilibrium the Democratic is relatively more moderate and the Republican relatively less moderate.

Figure 2: Nash Equilibrium of the Static Game

(a) Benchmark (b) Effect of $\downarrow z^{\mathrm{D}}$ (c) Effect of $\downarrow z^{\mathrm{E}}$



Note: This graph shows the best responses of the players. Panel (a) shows the best response of an Democrat Incumbent against a Republican Challenger and the best response of the Republican as well. Panel (b) shows the comparative statics to a negative ideology shock that moves the mean of the district to the left. Panel (c) shows the comparative statics to a negative economy shock.

3.2 Dynamic Game

In this section I describe the dynamic game. I start with a description of the state space and the transition matrix. Then I present the Bellman equations and the solution concept.

State Space

The state space is discrete. Each state $s = (p^{\mathrm{D}}_{-1}, p^{\mathrm{R}}_{-1}, I, z^{\mathrm{D}}, z^{\mathrm{E}}, f_{\mathrm{I}}, f_{\mathrm{C}}, D) \in S$ has eight elements.

1. p^{D}_{-1}, candidate D's previous position, lies on a grid between $p^{\mathrm{MIN}} = -2$ and 0.
2. p^{R}_{-1}, candidate R's previous position, lies on a grid between 0 and $p^{\mathrm{MAX}} = 2$.
3. $I \in \{0, 1\}$, which tracks the identity of the incumbent candidate in the current period with $I = 1$ meaning candidate D is the incumbent.
4. z^{D} the current mean ideology of the district. I assume z^{D} follows an AR(1) process and I discretize it using Tauchen (1986).
5. z^{E} the current economic conditions of the district. Similarly z^{E} follows an AR(1) process which I discretize.
6. $f_{\mathrm{I}} \in \{0, 1\}$, a Calvo style shock that defines whether the incumbent candidate gets a free adjustment ($f_{\mathrm{I}} = 1$) in the current election. In my model an incumbent candidate retiring or losing renomination is represented by a free change of its position.
7. $f_{\mathrm{C}} \in \{0, 1\}$, a free adjustment shock for the challenger.
8. $D \in \{0, 1\}$ keeps track of what's the party of the president. If $D = 1$, the president is of the Democratic party, and if $D = 0$, the president is of the Republican party.

These state variables affect the probability of winning through the mean utilities of voters of equation (9), which differ from the ones presented in equation (7) in three ways. First, if $f_{\mathrm{I}} = 1$ the incumbent candidate (in this case the Democrat) gets a free adjustment and the second term of $\bar{u}$D equals zero. Similarly, if $f_{\mathrm{C}} = 1$ the challenger candidate gets a free adjustment. Finally, economic conditions affect the incumbent only if he shares the party with the president ($D = 1$, for the case depicted here). This final shock is meant to capture that voters in a congressional district do not punish their incumbent House Representative if he opposes the president.

$$\begin{cases} \bar{u}_{\mathrm{D}} & = -\alpha_1 (p^{\mathrm{D}} - z^{\mathrm{D}})^2 - \gamma (p^{\mathrm{D}} - p^{\mathrm{D}}_{-1})^2 (1 - f_{\mathrm{I}}) + (v_I + \alpha_2 z^{\mathrm{E}} D) \\ \bar{u}_{\mathrm{R}} & = -\alpha_1 (p^{\mathrm{R}} - z^{\mathrm{D}})^2 - \gamma (p^{\mathrm{R}} - p^{\mathrm{R}}_{-1})^2 (1 - f_{\mathrm{C}}) + \alpha_3 z^{\mathrm{D}} \end{cases} \tag{9}$$

The choices of p^{D} and p^{R} affect the evolution of the state in two ways. First, they pin down the current probability of winning affecting the likelihood of the incumbency status next time I'. Second, they influence the distribution of $p^{\mathrm{D}\prime}$ and $p^{\mathrm{R}\prime}$ through a Gaussian kernel weighting as described in equation (10), which shows the probability of the i^{TH}

element of the grid given the action p^j. States closer to p^{D} (and p^{R}) get higher weight, decaying with squared distance at bandwidth b.

$$\begin{cases} \pi_i(p^{\mathrm{D}}) & \propto \exp\left\{-\frac{(p_i^{\mathrm{D}\prime}-p^{\mathrm{D}})^2}{2b^2}\right\}, \quad \text{with} \quad \sum_i \pi_i(p^{\mathrm{D}}) = 1 \\ \pi_i(p^{\mathrm{R}}) & \propto \exp\left\{-\frac{(p_i^{\mathrm{R}\prime}-p^{\mathrm{R}})^2}{2b^2}\right\}, \quad \text{with} \quad \sum_i \pi_i(p^{\mathrm{R}}) = 1 \end{cases} \tag{10}$$

I construct the transition matrix $Q(s'|s, p^{\mathrm{D}}, p^{\mathrm{R}})$ by combining these distributions with the discretized versions of the AR(1) processes. Let $f_z(z'|z)$ be the transition probability derived from the autoregressive process. Let $\mathbf{Pr}^{\mathrm{D}}(p^{\mathrm{D}}, p^{\mathrm{R}}; s)$ be the probability that candidate D (Democratic candidate) wins. For the Calvo style shocks let $g_{\mathrm{I}}(f_{\mathrm{I}}') = \lambda_{\mathrm{I}}^{f_{\mathrm{I}}'}(1-\lambda_{\mathrm{I}})^{(1-f_{\mathrm{I}}')}$, $g_{\mathrm{C}}(f_{\mathrm{C}}') = \lambda_{\mathrm{C}}^{f_{\mathrm{C}}'}(1-\lambda_{\mathrm{C}})^{(1-f_{\mathrm{C}}')}$, and $g_{\mathrm{D}}(D') = \lambda_{\mathrm{D}}^{D'}(1-\lambda_{\mathrm{D}})^{(1-D')}$[3].

$$\begin{aligned} Q(s'|s, p^{\mathrm{D}}, p^{\mathrm{R}}) = & \pi_i(p^{\mathrm{D}}) \cdot \pi_i(p^{\mathrm{R}}) \cdot \mathbf{Pr}^{\mathrm{D}}(p^{\mathrm{D}}, p^{\mathrm{R}}; s)^{I'}[1 - \mathbf{Pr}^{\mathrm{D}}(p^{\mathrm{D}}, p^{\mathrm{R}}; s)]^{(1-I')} \cdot \\ & f_{z^{\mathrm{D}}}(z^{\mathrm{D}\prime}|z^{\mathrm{D}}) \cdot f_{z^{\mathrm{E}}}(z^{\mathrm{E}\prime}|z^{\mathrm{E}}) \cdot g_{\mathrm{I}}(f_{\mathrm{I}}') \cdot g_{\mathrm{C}}(f_{\mathrm{C}}') \cdot g_{\mathrm{D}}(D') \end{aligned} \tag{11}$$

Note that actions p^{D} and p^{R} do not affect the distribution of district-level variables. In this sense, the choices candidates make do not affect the ideology (or economy) in the district.

Bellman Equations and Solution Concept

Once candidates know s any previous state is payoff irrelevant. Let $f^{\mathrm{D}}(s)$ and $f^{\mathrm{R}}(s)$ be the policy functions for candidates D and R. And let $\beta \in [0, 1)$ be the discount factor.

$$\begin{aligned} v^{\mathrm{D}}(s) &= \max_{p^{\mathrm{D}}} \quad (1-\beta)\mathrm{PU}^{\mathrm{D}}(p^{\mathrm{D}}, f^{\mathrm{R}}(s); s) + \beta \mathbf{E}\left[v^{\mathrm{D}}(s')|s, p^{\mathrm{D}}, f^{\mathrm{R}}(s)\right] \\ v^{\mathrm{R}}(s) &= \max_{p^{\mathrm{R}}} \quad (1-\beta)\mathrm{PU}^{\mathrm{R}}(f^{\mathrm{D}}(s), p^{\mathrm{R}}; s) + \beta \mathbf{E}\left[v^{\mathrm{R}}(s')|s, f^{\mathrm{D}}(s), p^{\mathrm{R}}\right] \end{aligned} \tag{12}$$

I focus in Markov perfect equilibria.

Definition 1. *A Markov perfect equilibrium of the model is a pair of value functions $(v^D(\cdot), v^R(\cdot))$ and a pair of policy functions $(f^D(\cdot), f^R(\cdot))$ such that for each $j \in \{D, R\}$ and each possible state,*

- *The value function $v^j(\cdot)$ satisfies Bellman equation* (12)*.*
- *The maximizer on the right side of* (12) *equal $f^j(\cdot)$.*

[3]For tractability, I assume that the president's party can change every two years, matching the House election cycle. A more realistic treatment would allow presidential turnover only every four years; I plan to incorporate this two-cycle structure in future versions of the model.

These equations characterize the dynamic interaction between the two candidates. In equilibrium, each candidate's policy is the best response to the other's, given the current state, and both anticipate how today's choices affect future states through s'. The next section describes the model solution and the algorithm I used to compute it.

3.3 Model Solution

I use value function iteration to compute the model solution following Pakes and McGuire (1994). The algorithm (1) begins with initial guesses for value and policy functions, $(v_j^{(0)}(s), f_j^{(0)}(s))$ for $j \in D, R$. At each iteration, I update the policy functions by solving each candidate's maximization problem given the opponent's previous policy, and then evaluate the corresponding value functions using the Bellman operator. Convergence is achieved when the maximum relative change across all states in both value and policy functions falls below $\epsilon = 10^{-10}$. Checking for convergence of the policy function is required to ensure that this is a fixed point.

Algorithm 1 Value Function Iteration

1: Initialize $(v_D^{(0)}, v_R^{(0)})$ and $(f_D^{(0)}, f_R^{(0)})$; set tolerance $\epsilon = 10^{-10}$ and iteration counter $\text{it} = 0$.
2: **repeat**
3: **for** each state $s \in S$ **do**
4: Update policies:

$$f_D^{(\text{it}+1)}(s) = \arg\max_p (1-\beta)\text{PU}(s, p, f_R^{(\text{it})}(s)) + \beta\mathbb{E}[v_D^{(\text{it})}(s')]$$

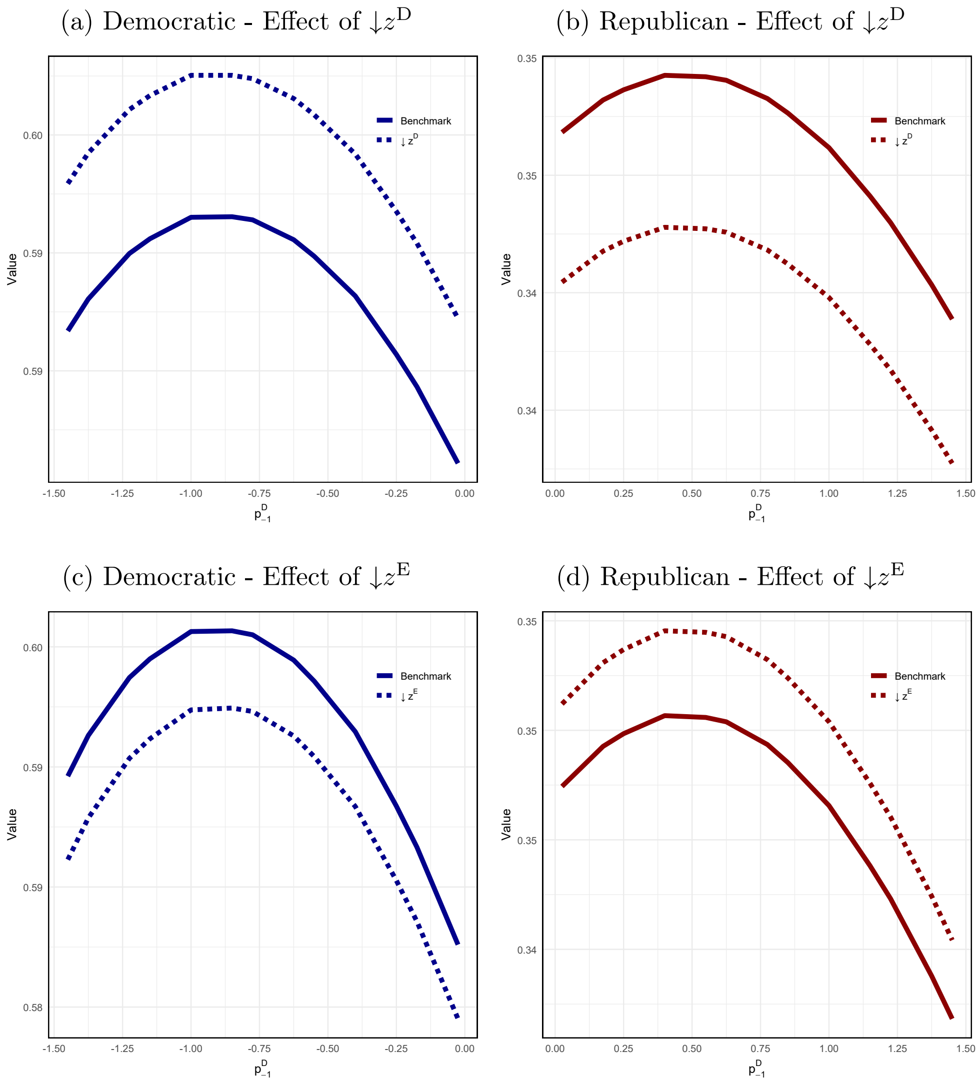
$$f_R^{(\text{it}+1)}(s) = \arg\max_p (1-\beta)\text{PU}(s, f_D^{(\text{it})}(s), p) + \beta\mathbb{E}[v_R^{(\text{it})}(s')]$$

5: Evaluate updated value functions $v_D^{(\text{it}+1)}(s)$ and $v_R^{(\text{it}+1)}(s)$.
6: **end for**
7: Compute maximum relative change in v_j and f_j for $j \in \{D, R\}$.
8: $\text{it} \leftarrow \text{it} + 1$
9: **until** convergence: $\max_s \left| \frac{v_j^{(\text{it})}(s) - v_j^{(\text{it}-1)}(s)}{1 + v_j^{(\text{it})}(s)} \right| < \epsilon$ and $\max_s \left| \frac{f_j^{(\text{it})}(s) - f_j^{(\text{it}-1)}(s)}{1 + |f_j^{(\text{it})}(s)|} \right| < \epsilon$.

The state space is discrete and consists in $11 \times 11 \times 2 \times 7 \times 7 \times 2 \times 2 \times 2 = 94,864$ elements: I use 11 grid points for the previous positions and discretize each shock in 7 points using Tauchen (1986). I get two value functions for each candidate since they can be of two types: incumbent and challenger. I construct the initial guess using a multigrid algorithm, starting from a coarse grid and progressively refining it. I further accelerate the value function iteration by solving the maximization step only every ten iterations once the maximum relative change in values falls below 10^{-5}. In the appendix (B) I show a robustness exercise where I vary the initial guess.

Figure (3) displays the equilibrium value functions for a Democratic incumbent on the first column and a Republican challenger on the second column. In the top row district's ideology shifts left ($\downarrow z^{\mathrm{D}}$), this increases the value of the Democratic candidate and reduces the value of the Republican candidate. In the bottom row economic conditions worsen ($\downarrow z^{\mathrm{E}}$) and the incumbent's value declines while the challenger's increases. It is the challenger who capitalizes bad economic conditions in expense of the incumbent.

Figure 3: Value Function



Note: This figure shows the value functions for a Democratic incumbent (left column) and a Republican challenger (right column). Panels (a) and (b) show the effect of a shift of the district's ideology to the left, which benefits the Democratic and harms the Republican. Panels (c) and (d) show the effect of worse economic conditions, which harm the incumbent and benefit the challenger. For this figure I assumed $D = 1$, $f_{\mathrm{I}} = 0$, and $f_{\mathrm{C}} = 0$. The party of the president is the same as the incumbent's, and no candidate gets a free adjustment (which makes the value constat with respect to the previous position).

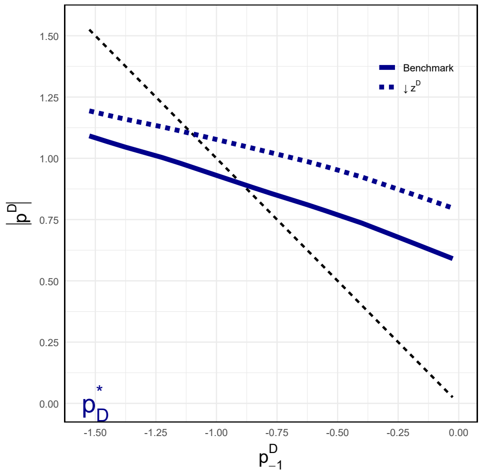
Figure (4) presents the policy functions for a Democratic incumbent and a Republican challenger. In the vertical axis I plot the absolute value of positions, so this axis has the interpretation of moderate positions for low values and extreme positions for high values.

Challengers generally choose more moderate positions than incumbents, reflecting their need to attract a broader voter base. When district ideology shifts left ($\downarrow z^{\mathrm{D}}$, in panels (a) and (b)), both incumbents and challengers move left as well, aligning with voter preferences. In contrast, when economic conditions worsen ($\downarrow z^{\mathrm{E}}$, in panels (c) and (d)), incumbents adopt more moderate positions, while challengers' policies become slightly more extreme. Economic downturns have this moderating effect on those already in office. The stronger the electoral competition, the more moderate positions candidates take. Incumbents benefit from an advantage that makes competition weaker, allowing them to choose policies closer to their preferred positions than challengers do. Economic conditions interact with this effect: when economic conditions are bad, the electoral competition gets relatively stronger, and incumbents have an incentive to moderate their positions.

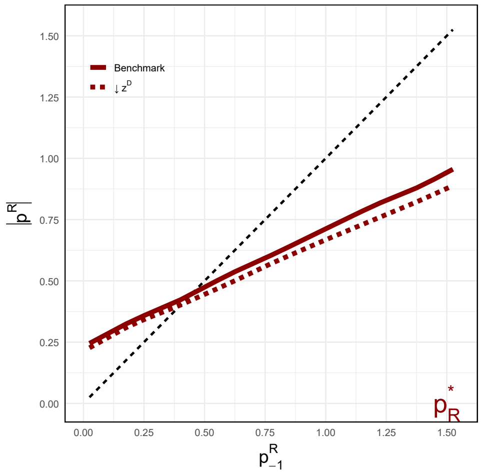
In Figure (5) I focus on the response of the Democratic incumbent candidate to a negative shock to the district's economy. In the following analysis assume the starting point is point B before the shock. The dark blue line represents the candidate's policy function after the shock, already described in panel (c) of Figure (4). The light blue line is the policy function of a candidate that only cares about the current election, which differs from the sophisticated candidate's policy because of two main reasons. First, abstracting away from any adjustment cost, if the myopic candidate were to choose freely his position, he'd locate in point M, and, if the forward-looking candidate chooses freely his, he'd locate in point F. In the horizontal axis, the distance between points B and M isolates the response of the candidate to worsening economic conditions due to current electoral incentives. In turn, the distance between points M and F isolates the response of the candidate due to future electoral incentives. The forward-looking candidate understands that in the future the economic conditions are likely to be unfavorable again, and then, he is willing to trade-off a lower chance of winning the current election for a better position in next period. Second, if I assume that they pay the adjustment cost, it is possible to do the same decomposition on the vertical axis. The vertical distance highlighted in yellow is the piece of the total adjustment that is due only to current electoral incentives, while the piece in purple is due to future electoral incentives. Furthermore, the adjustment cost explains why the slope of the policy function of the myopic candidate is steeper. For the myopic candidate this is exclusively a cost: it only reduces his chance of winning. For the forward-looking candidate it can be interpreted as an investment: he pays the cost today and in the next electoral cycle his starting point is more favorable or, from another point of view, this candidate can distribute the adjustment cost across multiple electoral cycle, something that the myopica candidate cannot do.

Figure 4: Policy Function

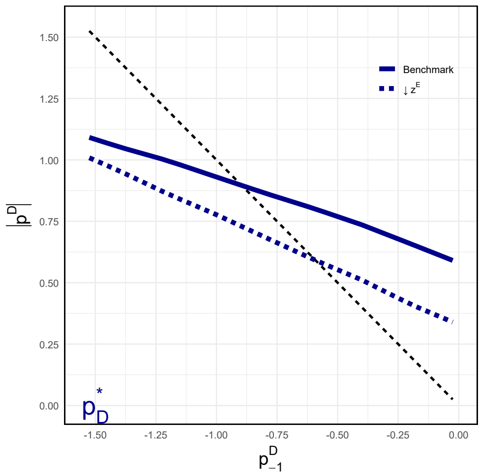
(a) Democratic - Effect of $\downarrow z^{\mathrm{D}}$



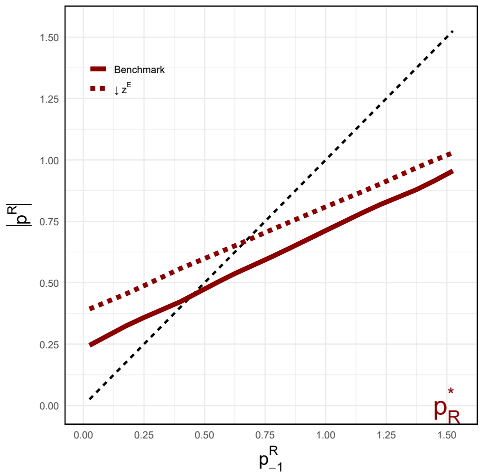
(b) Republican - Effect of $\downarrow z^{\mathrm{D}}$



(c) Democratic - Effect of $\downarrow z^{\mathrm{E}}$



(d) Republican - Effect of $\downarrow z^{\mathrm{E}}$



Note: This figure shows the policy functions for a Democratic incumbent and a Republican challenger. In the vertical axis I plot the absolute value of the positions so than higher values represent extremism and lower values moderation. Because the incumbent has an advantage, he can typically afford to be more extreme than the challenger. Panels (a) and (b) show the effect of the district's ideology shifting left: both candidates move left, with the Democratic candidate becoming more extreme and the Republican candidate more moderate. Panels (c) and (d) show the effect of worse economic conditions. In this case the incumbent chooses moderation and, in response, the challenger can afford to be more extreme. I assumed $D = 1$, $f_{\mathrm{I}} = 0$, and $f_{\mathrm{C}} = 0$. The party of the president is the same as the incumbent's, and no candidate gets a free adjustment (which would make the policy horizontal with respect to the previous position and going through the point the policy crosses the 45 degree line).

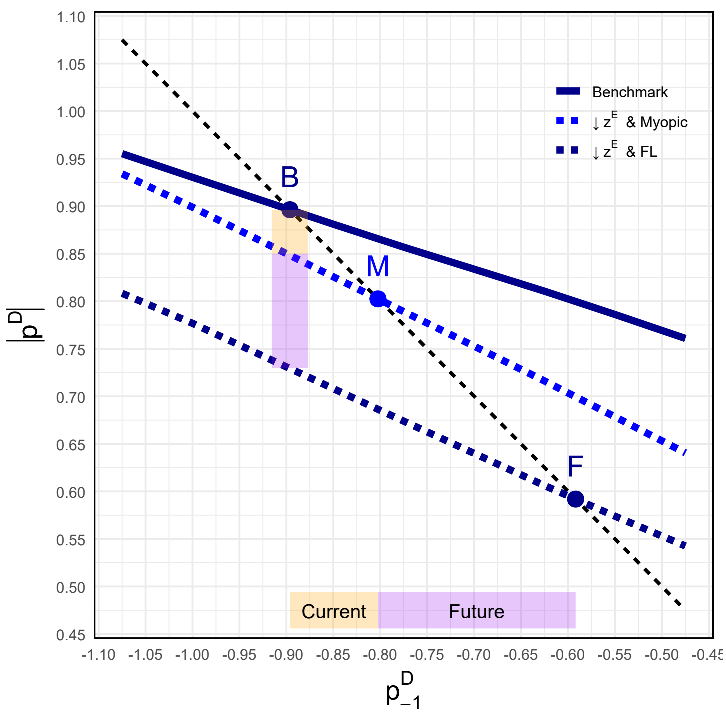


Figure 5: Policy Function: Myopic vs Forward-Looking

Note: This figure compares the responses of a forward-looking incumbent and a myopic incumbents to a negative shock to the economic conditions. If the adjustment was free, the myopic candidate would move from B to M in the horizontal axis, and the forward-looking candidate would move from B to F in the horizontal axis. The FL candidate understands that these bad economic conditions are persistent and is willing to trade-off chances of winning today for a better position in the future. Because the adjustment is not free, the adjustments actually made can be read from the vertical axis. The policy function of the myopic candidate is steeper because he's unable to distribute the adjustment cost he has to pay across different elections. In yellow and purple I decompose the total adjustment into the part driven by current electoral incentives, and that part driven by future electoral incentives.

4 Calibration

To map the model to the data I measure three things at the congressional district level: previous positions of each candidate, incumbency status of each candidate, and district's observed ideology and economic conditions. Recall $s = (p^{\mathrm{D}}_{-1}, p^{\mathrm{R}}_{-1}, I, z^{\mathrm{D}}, z^{\mathrm{E}}, f_{\mathrm{I}}, f_{\mathrm{C}}, D)$. And time increases by 2 years (a full electoral cycle in the House lasts 2 years).

1. $p^{\mathbf{D}}_{-1}$ **and** $p^{\mathbf{R}}_{-1}$. On a given cycle, I focus on the two main candidates in the district and check their previous CFscores. I map this CFscore to the previous choice they made in the model. For candidates competing in the general election for the first time, I check whether they competed in a primary election in the previous cycle and, if so, I use that CFscore as the previous choice. If this is the first time in my sample, I assume they inherit the choice of the previous candidate of the same party. These CFscores are the mean of the previous positions p^{D}_{-1} and p^{R}_{-1}, which in turn are a realization of the transition kernel distribution[4]. In the data, challengers typically have a less moderate position than the one my model predicts, the reason behind this fact is because I do not model primary elections. Challengers face more competitive primary elections, and primary elections give them a strong incentive to differentiate themselves from other candidates in the same party. In my model this incentive is not present. To work around this limitation, I demean CFscores and assign them the mean predicted by my model. In this way I can take advantage of the information the CFscores provide in relative terms.

2. I. Whenever it's clear who the incumbent is, I use that to describe the incumbency status in the district. If there was an open seat, then the incumbent is from the same party as the previous winner. In other words, the incumbency status is inherited.

3. $z^{\mathbf{D}}$ **and** $z^{\mathbf{E}}$. For the district ideology z^{D} I use the districts' vote share going to the Republican presidential nominee. I demean this value so $\mathbf{E}[z^{\mathrm{D}}] = 0$ and scale it so its standard deviation is $\frac{1}{3}$, so that the value of z^{D} typically lies in $[-1, 1]$. Next I use linear interpolation to approximate its value during midterm years. For the district economy z^{E} I use the negative of unemployment at the congressional district level from the ACS. Once again, I demean this value so $\mathbf{E}[z^{\mathrm{E}}] = 0$ and scale it so its standard deviation is $\frac{1}{3}$.

4. $f_{\mathbf{I}}$, $f_{\mathbf{C}}$, **and** D are straightforward. f_{I} and f_{C} equal 1 when the candidate differs from the previous cycle, and D is set by the president's party.

The first half of Table (5) lists the externally calibrated parameters. These values are set using empirical moments or normalization choices rather than being estimated within

[4] I've experimented with the CFscores being the previous position exactly, and interpolating the value and policy functions. The results do not depend on this.

the model. I choose the discount factor so incumbents remain 5.52 cycles on average. This is the mean number of cycles incumbents remain in the House of Representatives conditional on keeping their seat at least 2 cycles. In terms of the ideology shock, I calibrate its persistence by running an AR(1) on z^{D} district-by-district and averaging across districts. I set its standard deviation such that the unconditional standard deviation is $\frac{1}{3}$, ensuring that typically the ideology shock lies in $[-1,1]$. I do the same for the economic shock z^{E}. Finally I set the bandwidth of the transition kernel to $b = 0.10$ and the favorite positions to ± 1.5, -1.5 for Democrats and 1.5 for Republicans.

Table 5: Model Parameters and Calibration

	Externally Calibrated Parameters			
	Description	**(D)**	**(R)**	**Calibration / Source**
β	Discount factor	0.8189		Incumbents remain ∼5.5 cycles on average
ρ^{D}	Persistence of district ideology	0.8173		AR(1) estimate by district, averaged
σ^{D}	Std. dev. of district ideology	0.1920		Normalized: $\sqrt{1-\rho^2}/3$
ρ^{E}	Persistence of economic shocks	0.7477		AR(1) estimate by district, averaged
σ^{E}	Std. dev. of economic shocks	0.2213		Normalized: $\sqrt{1-\rho^2}/3$
b	Bandwidth of transition kernel	0.10		Chosen for smooth transition dynamics
p^*	Ideal (favorite) policy position	-1.5	$+1.5$	Normalization
λ_{I}	Prob. of free adjustment I	0.10		One every ten cycles
λ_{C}	Prob. of free adjustment C	0.33		One every three cycles
λ_{D}	Prob. D President	0.50		Normalization

	Internally Calibrated Parameters			
	Description	**(D)**	**(R)**	**Target / Moment**
α_1	Sensitivity to district ideology	0.30		$\mathrm{corr}(p, z^{\mathrm{D}})$ in swing districts ($z^{\mathrm{D}} \in [-0.3, 0.3]$)
α_2	Sensitivity to economy	4.00	2.00	$\mathrm{corr}(p, z^{\mathrm{E}})$ for D and R incumbents
α_3	Partisan alignment strength	8.00	5.00	Share of mismatched winners
γ	Adjustment cost	0.50		Autocorrelation of policy positions
v^{I}	Incumbent advantage	1.75		Average share of incumbents reelected
v^{O}	Value of office	0.15		$\mathrm{avg}\lvert p^{\mathrm{R}} - p^{\mathrm{D}}\rvert$ across districts & time

Note: Externally calibrated parameters (top table) are set using data moments or normalization choices. Internally calibrated parameters (bottom table) are chosen so the model matches key empirical regularities such as incumbency rates, ideological persistence, and correlations between candidate positions, district ideology, and economic conditions.

There are six parameters that I calibrate internally. Some of them take different values for Democrats and Republicans to allow for heterogeneous responses between parties. I discipline the sensitivity to district's ideology α_1 with the correlation between positions and district ideology in swing districts, since those districts are where this correlation is the most informative. For the sensitivity to district's economic conditions α_2, I use the correlation between the position of incumbents and the economy of the district. Parameter α_3 captures the fact that it's unlikely to see a Democratic winner in a reliably Republican district (and vice-versa). I calibrate this parameter to match the proportion of Democrats winning in a Republican district. Note this parameter is candidate-specific: it's more likely to see Democratic candidates in Republican districts than the other way around. Next, I calibrate the adjustment cost to match the autocorrelation of positions and the value of the incumbent advantage to match the average share of incumbents being re-elected in my sample. Finally I discipline the value of holding office v^{O} by averaging across districts and time the difference between the position of the Republican candidate and the Democratic candidate.

4.1 Model Fit

Table (6) shows that the model reproduces the main empirical moments well. By considering party-specific values for the sensitivity to economic shocks and partisan alignment, I was able to match the correlation between positions and economic shocks and the proportion of mismatched winners closely. The model does a good job in terms of the autocorrelation of positions and the average proportion of incumbents. The responsiveness of positions to district ideology implied by the model is stronger than its corresponding value in the data. Two reasons may explain this. First, I proxy district ideology with the presidential vote share, but the presidential electorate differs from the House electorate. Second, candidates are subject to primary elections with different degrees of competitiveness. Candidates facing a competitive primary election may respond to a subset of the electorate, and since my model abstracts from primary elections, the correlation I intend to target may be attenuated in the data.

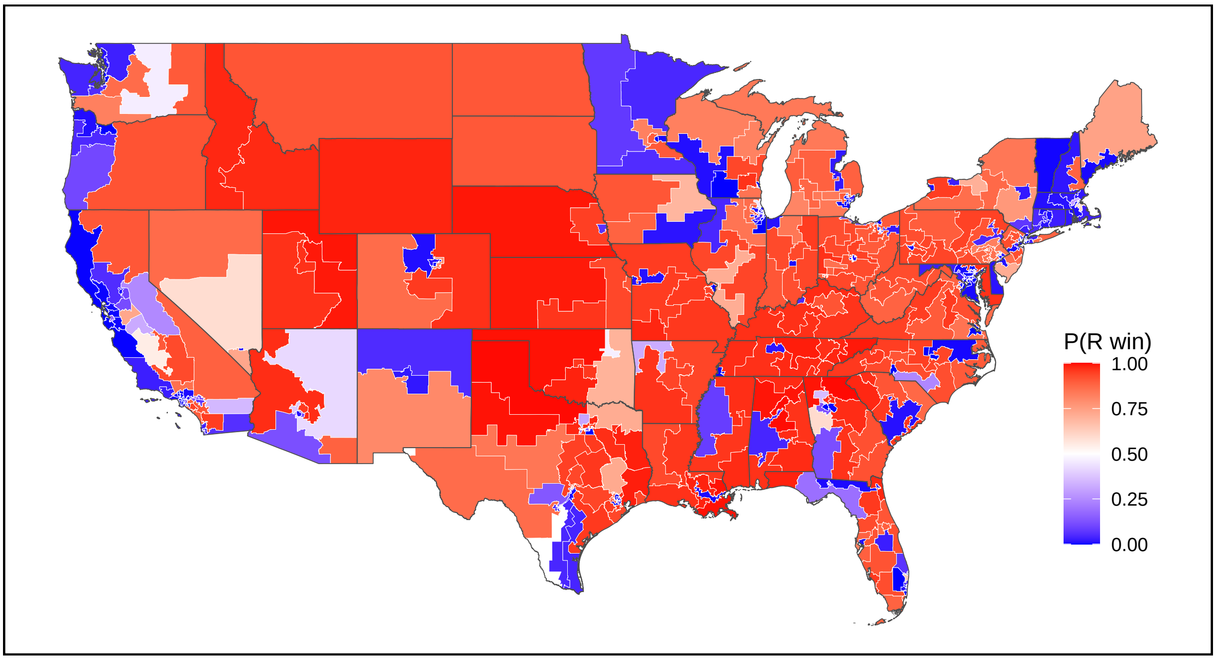
Table 6: Targeted Moments in Model vs. Data

	Model		**Data**	
	(D)	**(R)**	**(D)**	**(R)**
corr(p, z^{D}) in swing districts ($z^{D} \in [-0.3, 0.3]$)	0.40		0.16	0.25
corr(p, z^{E}) for incumbents	-0.29	0.19	-0.34	0.18
Prop. D Winners in $z^{D} > 0$ CD	0.25	$\times$	0.25	$\times$
Prop. R Winners in $z^{D} < 0$ CD	$\times$	0.18	$\times$	0.16
Autocorrelation of positions	0.71	0.72	0.73	0.74
Average proportion of incumbents	0.84		0.85	
Average $\lvert p^{R} - p^{D}\rvert$ across districts	1.55		1.68	

Note: To construct the model moments I simulated 435,000 districts where the incumbency status is random and the initial positions coincide with the steady state value. Then I run the model 100 cycles so that the effect of the initial conditions washes out. This table display cross sectional averages and proportions.

I use the model to generate a cross-sectional prediction of Republican win probabilities for the 2016 House election. Figure (6) plots these probabilities by congressional district. The model successfully reproduces the broad geographic patterns of partisanship: it captures the Democratic advantage along the East and West Coasts and in major metropolitan areas, and the strong Republican advantage across the Plains and much of the South. As a simple exercise, I classify each district according to the model's predicted winner: if the probability that a Republican wins exceeds 0.5, I assign the seat to a Re-

Figure 6: Model-Implied Republican Win Probabilities, 2016 House Election



Note: Each congressional district is colored along a red–blue gradient based on the model-implied probability that the Republican candidate wins the 2016 House election. Dark red indicates near-certain Republican victories, dark blue near-certain Democratic victories, and lighter shades represent more competitive districts. The model captures the observed partisan geography—Republican strength across the Plains and South, and Democratic dominance along the coasts and major metropolitan areas.

publican; otherwise, to a Democrat. When comparing this predicted map to the actual 2016 electoral outcome, the model misclassifies 23 out of the 435 districts.

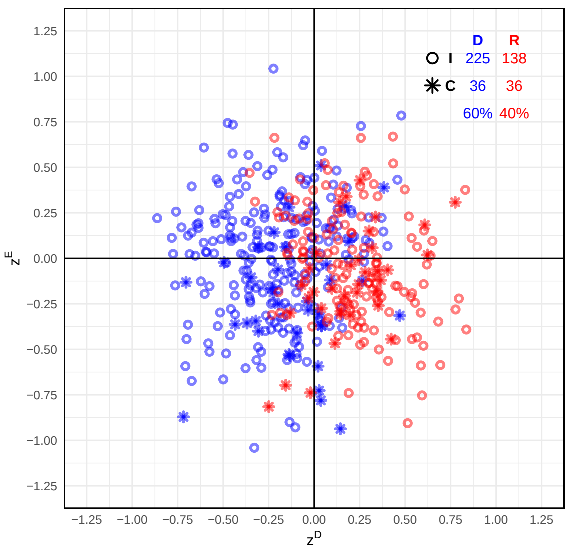
4.2 Sensitivity Analysis

Before turning to the counterfactual exercises, I conduct a sensitivity analysis to assess how shocks affect the composition of the House. My benchmark is a House of Representatives with a Democratic majority, where 60% of the seats belong to that party. Panel (a) of Figure (7) shows this benchmark: each point represents a congressional district characterized by its current ideological position z^{D} on the horizontal axis and its current economic conditions z^{E} on the vertical axis. Democrats hold those seats marked in blue and Republicans hold those marked in red. Stars represent challenger wins and circles incumbent wins. There is a strong correlation between district ideology and the party of the winner: as one moves right, Republican seats become more frequent. There is a strong correlation between the economic conditions and the proportion of challengers as well: as one moves down, the frequency of challenger wins increases.

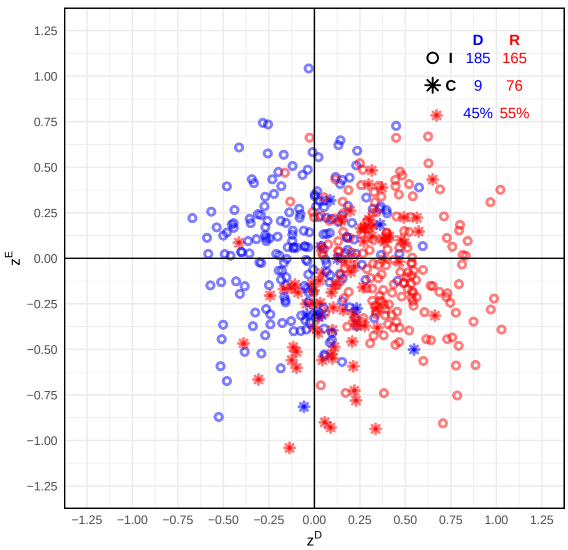
Panel (b) of Figure (7) shows the effect of a nationwide 1-SD shock to districts' ideology that shifts districts to the right, keeping the economic conditions constant. Republicans

Figure 7: Sensitivity to Shocks

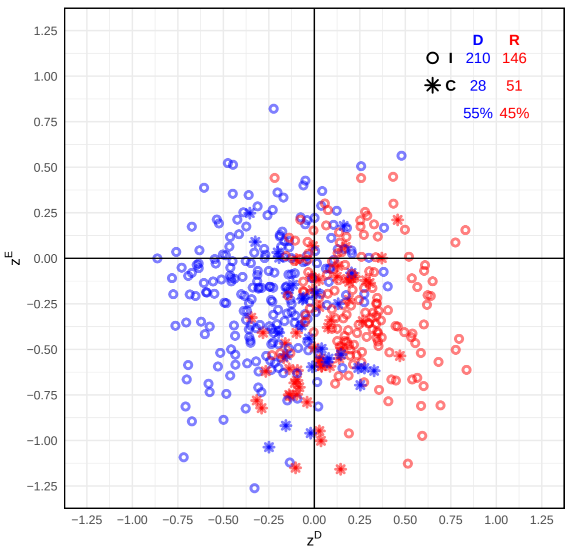
(a) Benchmark



(b) Effect of $\uparrow z^{\mathrm{D}}$



(c) Effect of $\downarrow z^{\mathrm{E}}$



Note: This figure illustrates how nationwide shocks to ideology and economic conditions affect the partisan composition of the House. Panel (a) shows the benchmark distribution of districts across ideological and economic dimensions, with blue (red) points denoting Democratic (Republican) seats and stars indicating challenger wins. Panel (b) applies a one–standard-deviation rightward shift in ideology, leading Republicans to gain a majority. Panel (c) applies a one–standard-deviation negative economic shock, which harms the party initially holding more seats. Overall, ideological shocks shift control, while economic shocks have a mean-reverting effect on the balance of power.

go from 174 seats before the shock to 241 seats after, which represents 55% of the seats. After the shock, most of the Republican incumbents keep their seat: only 9 Republican incumbents lose to a Democratic challenger. In contrast, 76 out of 261 Democratic incumbents lose their seat to Republican challengers. As expected, this shock affects Democratic candidates negatively and makes them lose the majority in the House. The proportion of Democratic incumbents that lose to a challenger is $\frac{76}{261} \simeq 0.29$, while the proportion of Republican incumbents that lose to a challenger is $\frac{9}{174} \simeq 0.05$. Following this shock, the average position of incumbents goes from -1.12 to -0.99 for Democratic incumbents (this movement represents around 40% of a standard deviation[5]) and from 1.07 to 1.27 for Republican incumbents (which represents around 70% of a standard deviation). Note that all candidates move to the right.

Panel (c) of Figure (7) shows the effect of a nationwide 1-SD negative shock to economic conditions, holding ideology constant. Democrats go from 261 seats before the shock to 238 after, maintaining a slight majority of about 55%. An economic shock affects Democratic incumbents and Republican incumbents equally, but this harms Democrats more because they started off with more seats. To see this, note that the proportion of Democratic incumbents who lose to a Republican challenger is $\frac{51}{261} \simeq 0.20$, and the proportion of Republican incumbents that lose to a Democratic challenger is $\frac{28}{174} \simeq 0.16$. Because both proportions are similar, the party that starts with the majority suffers the most in absolute terms. In this model bad economic shocks tend to have a mean-reverting effect on the partisan composition of the House. If economic conditions continue to deteriorate, the party holding a majority loses seats at a faster rate, pushing the chamber toward an even 50–50 balance provided that district ideologies are roughly symmetric. Following this shock the average position of incumbents goes from -1.12 to -1.09 for Democratic incumbents (a movement equivalent to 9% of a standard deviation) and from 1.07 to 1.09 for Republican incumbents (a movement equivalent to 7% of a standard deviation). Once again, candidates on average move to the right: Democratic incumbents because they moderate themselves after a bad economic shock; Republican incumbents, because the benchmark situation (and Republicans themselves) were skewed toward the left to begin with.

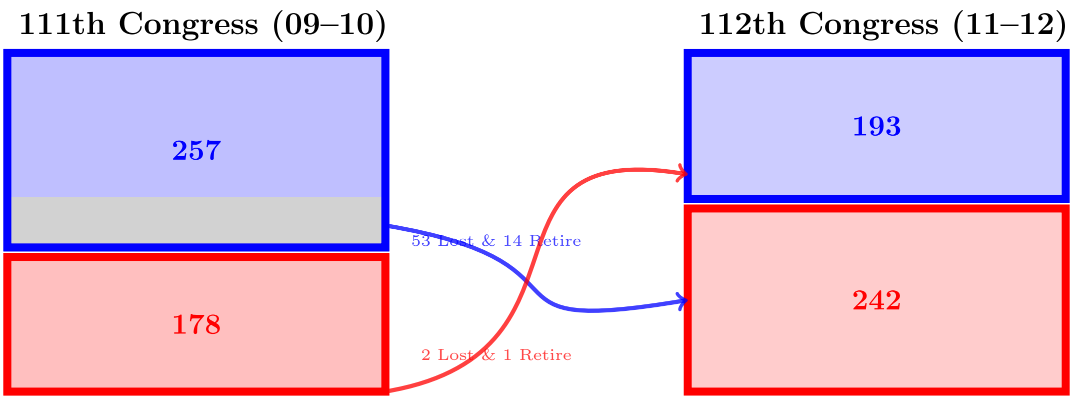
Starting from a balanced 50–50 House, I simulate a 1-SD negative shock to unemployment. The shock shifts both parties' mean policy positions toward the center. The magnitudes are around 20% of one SD for Democrats and around 10% of a SD for Republicans. This confirms that worsening economic conditions have a moderating effect on both sides, which was previously obscured in the skewed benchmark case where one party initially held a majority. Consistent with the moments reported in Table (6), Democrats react more to an economic shock.

[5] The unconditional standard deviation of incumbents' positions is 0.3031 for Democrats and 0.2740 for Republicans.

5 Counterfactual

I focus the counterfactual analysis on the 2010 election, between the 111th (2009–2010) and 112th (2011–2012) Congresses. This election followed the Great Recession, when unemployment remained high across most districts, and marked a sharp Republican swing in the House. In the 111th Congress the composition was 257-178 in favor of Democrats, but after the 2010 election Republicans increased their seat count by 64, which was the largest seat change in the last 35 years. Out of the initial 257 Democratic House Representatives: 17 retired and the party kept 3 of these, and 53 lost re-election. Out of the initial 178 Republican House Representatives: 19 retired, but the party managed to keep 18 of these, and only 2 lost re-election. Republicans capitalized on this negative economic shock by keeping most of their previous seats and getting a significant number of challenger wins. Figure (8) illustrates the changes following the 2010 House election.

Figure 8: 2010 House Elections



Note: Between the 111th (2009–2010) and 112th (2011–2012) Congresses, Republicans gained 64 seats. Of the 257 Democratic-held seats, 190 remained Democratic, 53 were lost to Republican challengers, and 14 turned Republican after retirements. On the Republican side, 178 seats became 242: 175 remained Republican (including open seats that they were able to win back again), and only 3 were lost in favor of Democrats.

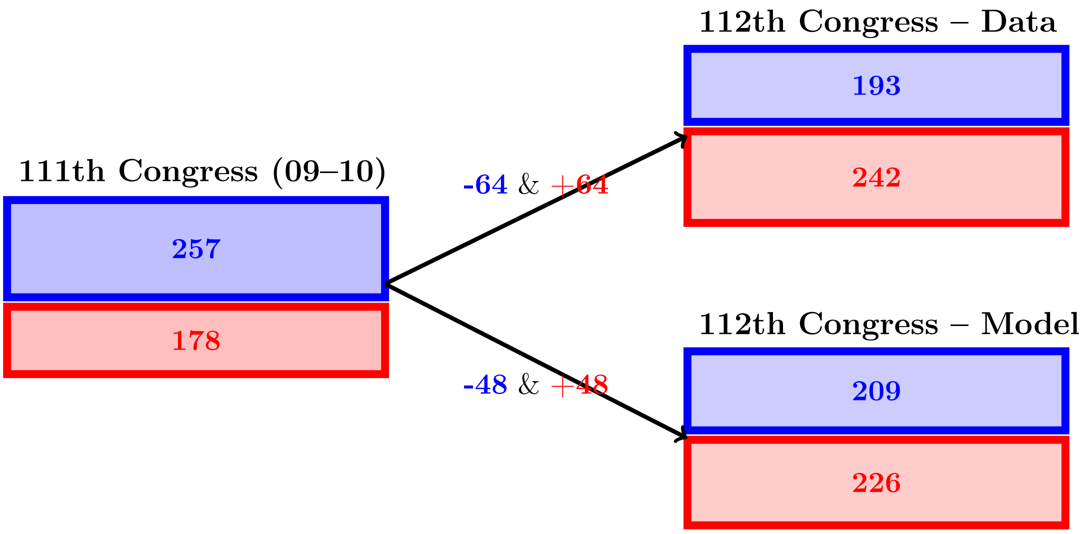
I now use the model to replicate the dynamics of the 2010 election, assessing whether the observed partisan swing can be explained by the deterioration in economic conditions that followed the Great Recession. In a given district, the state in 2010 $s_{2010} = (p^{\mathrm{D}}_{2008}, p^{\mathrm{R}}_{2008}, I_{2010}, z^{\mathrm{D}}_{2010}, z^{\mathrm{E}}_{2010})$ has five elements: the previous positions of both candidates, their incumbency status, the mean ideology, and the value of the economic shock. The previous position is a realization of the transition kernel where I set its mean to the rescaled value of the candidate's CFscore in 2008[6]. Following the discussion from the calibration section, I rescale the observed CFscores to match their mean with the average predicted by the model. Incumbency status is inherited from the previous cycle. For the

[6]One alternative is to treat the rescaled CFscores as the candidates' actual prior positions and interpolate the corresponding value and policy functions. I have implemented this approach as a robustness check, and the results remain the same.

ideology and economy shocks, I use 2010 data after the normalization discussed in the previous section.

I feed the model with data from all the congressional districts and simulate 10000× the number of districts to generate the distribution of electoral outcomes implied by the model under the economic and ideological conditions observed in 2010. Figure (9) shows the results. The model accounts for three quarters of the observed seat change between the 111th and 112th Congresses. In the data $\frac{190}{257} \simeq 0.74$ of Democrats kept their seat and $\frac{175}{178} \simeq 0.98$ of Republicans kept theirs. My model predicts correctly that 72.5% of Democrats reelect, but it predicts that only 87.1% of Republicans do. This gap between the model and the data reflects that the model does not capture how strongly Republicans benefited electorally from the poor economic conditions of 2010. In addition, the comparison between 2008 and 2010 may be affected by differences in turnout associated with presidential versus midterm elections. I plan to incorporate this turnout channel in future work.

Figure 9: Seat Change: Actual vs. Model



Note: The left panel shows the composition of the 111th Congress (2009–2010), with 257 Democratic and 178 Republican seats. The upper right panel represents the actual 112th Congress (2011–2012), where Republicans gained 64 seats. The lower panel shows the model prediction, which would have produced a smaller swing of 48 seats. Arrows summarize the net change in partisan control between periods.

Next I present two additional exercises. First, I explore this asymmetry. I modify the model to allow the worsening of economic conditions to favor Republicans. This exercise helps gauge how much additional punishment voters directed specifically toward Democrats in 2010. Second, I do a counterfactual exercise to quantify the relative contribution of economic versus ideological forces in explaining the observed seat change in favor of Republicans.

5.1 Measuring Economic Asymmetry Against Democrats

The Great Recession benefited Republican House Representatives: as seen in the previous section, the majority of the incumbent Republicans managed to keep their seat in the 2010 election. Using my model I quantify, in terms of probability of winning, by how much Republican House members profited, on average, from bad economic conditions. I keep my benchmark calibration from Table (5) except for the sensitivity to economic conditions α_2 for Republicans. Typically, this parameter is positive to capture that incumbents capitalize good economic times and suffer in recessions. One way to capture the fact that voters may punish Democrats because they were the party in charge nationwide is to make this parameter negative: now bad economic times benefit incumbent Republicans.

I recalibrate my model several times by lowering the value of α_2 each time, until I can replicate the observed seat change. For a value of $\alpha_2^{\mathrm{R}} = -3$, I account for a change of 60 seats in favor of Republicans. The proportion of incumbent Democrats that re-elect stays around 72%, as in the benchmark calibration, but the proportion of incumbent Republicans that re-elect increases to 92%, due to the fact that the increase in unemployment now favors them. In the spirit of quantifying how much Republicans benefited in terms of probability of winning, I calculate the following average change in probability of winning for different subgroups.

$$\mathrm{AWG} = \frac{1}{N}\sum_i \left[\mathbf{Pr}(\mathrm{Win}_i|\alpha_2^{\mathrm{R}} = -3) - \mathbf{Pr}(\mathrm{Win}_i|\alpha_2^{\mathrm{R}} = +2)\right] \tag{13}$$

Relative to the benchmark calibration, I calculate by how much the probability of winning increases, and average this gain. This is the Average Win-Probability Gain (AWG). This is a summary measure of how much the nationwide anti-Democratic sentiment during 2010 translated into higher winning chances for Republican House members. Table (7) reports this average difference for different subgroups, and bootstrap standard errors are in parentheses.

Incumbent Republicans benefited the most from the anti-Democratic sentiment in 2010, on average, their probability of winning increased by about 17 percentage points when the model allows bad economic conditions to favor them. Their Average Win-Probability Gain (AWG) is large in left-leaning districts (0.34 on average, but across few districts) and declines sharply as districts become more conservative (0.05 on average). In contrast, challengers' probabilities hardly change, suggesting that the electoral advantage from bad economic conditions was concentrated among incumbents already holding office rather than among new entrants. This result is expected. Adjusting α_2 only for Republican incumbents affects how they respond to economic shocks, but not Republican challengers. The latter's response to bad economic conditions was already captured

Table 7: Average Win-Probability Gain (AWG) by Incumbency and Ideology

	Left $z^{\mathrm{D}} < -0.2$	**Center** $-0.2 < z^{\mathrm{D}} < +0.2$	**Right** $z^{\mathrm{D}} > +0.2$	**Total**
		Republican Incumbents		
AWG	0.343	0.224	0.054	0.169
	(0.062)	(0.019)	(0.006)	(0.014)
Observations	13	96	66	175
		Republican Challengers		
AWG	0.005	-0.002	0.002	0.000
	(0.001)	(0.004)	(0.001)	(0.002)
Observations	121	96	21	238

Note: The table reports the Average Win-Probability Gain (AWG) for Republicans, defined in equation (13). Standard errors in parentheses are obtained from 10000 bootstrap replications. Columns group districts by ideology, and rows distinguish incumbents and challengers.

by the α_2 parameter of Democrats, which governs how challengers' opportunities change when incumbents' fortunes decline. Overall, the results indicate that the nationwide sentiment favoring Republicans in 2010 operated mainly through higher re-election chances for Republican incumbents in previously Democratic or centrist districts.

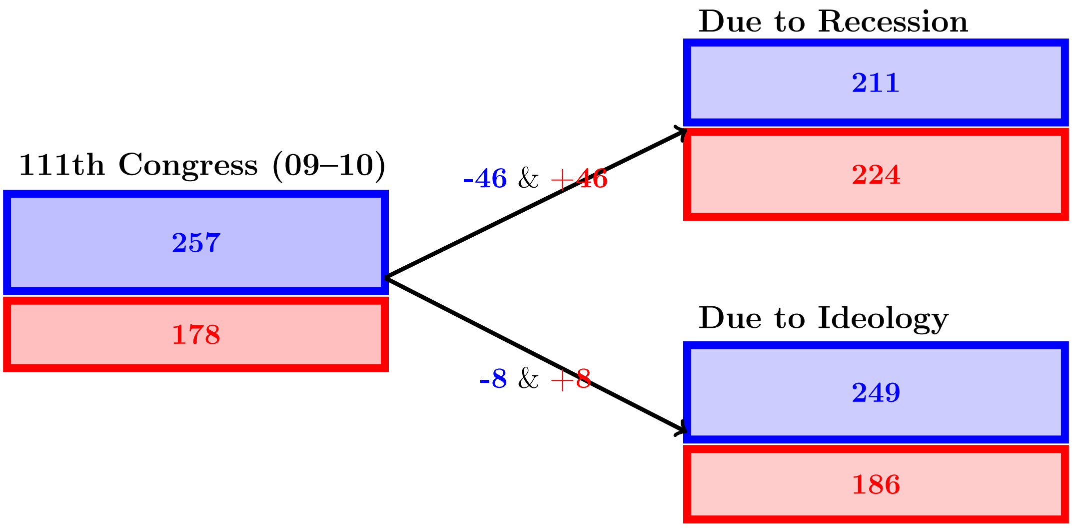
5.2 Decomposing the 2010 Seat Change: Economy vs. Ideology

To assess the relative contribution of economic and ideological factors to the 2010 seat change, I use the model to simulate two counterfactual scenarios. In the first, I allow only economic conditions to vary while holding district ideology fixed at its pre-election level. In the second, I hold economic conditions at normal (non-recession) levels while allowing district ideology to vary as observed.

The top-right diagram of Figure (10) shows the first counterfactual. I feed the model with the 2010 economic conditions z^{E}_{2010}, but keep the ideology of the previous cycle z^{D}_{2008}. I simulate 10000× the number of districts and present the resulting distribution of seats. According to the model, the Great Recession explains a change of 46 seats in favor of Republicans and it is responsible for reducing the Democratic majority from 59% in the 111th Congress to 48% in the counterfactual 112th Congress. Out of the initial 257 Democratic members, around 75.1% keep their seat, while out of the initial 178 Republican members, around 89.1% keep theirs. The resulting composition resembles that of the 104 Congress (1995–1996), the closest in balance over the past three decades, with 230 seats for the Republican party.

The bottom-right diagram of Figure (10) shows the opposite counterfactual where I keep the unemployment level fixed to normal (non-recession) values. Because the American Community Survey does not measure unemployment at the congressional district

Figure 10: Counterfactual Congresses



Note: This figure shows two counterfactual Congresses after the 2010 election. The left panel shows the initial composition, while the right panels show simulated seat distributions when ideology or the economy changes individually. Blue bars represent Democratic seats, red bars Republican seats. Arrows indicate the net seat gains and losses relative to the previous Congress.

level before 2010, I use the 2014 unemployment level which I take as representative of a non-recession year. Ideology alone explains a change of 8 seats in favor of Republicans. This reduces the Democratic majority slightly: from 59% to 57%. Out of the initial Democratic members of the 111th Congress, 88% keep their seats; and out of the initial Republican members, 87.3% keep theirs. These proportions are closer to the overall averages of incumbency retention rates observed across past Congresses. Once economic conditions normalize, re-election rates return to their typical levels. The resulting composition closely resembles that of the immediately preceding 111th Congress. Without the recession, little would have changed in the House after the 2010 midterm elections.

Taken together, these two counterfactuals suggest that adverse economic conditions played a dominant role in the 2010 realignment. The Great Recession accounts for the majority of seat changes, about 46 seats versus 8 if one considers ideology alone. In other words, while changes in district ideology contributed modestly to the Republican gains, the bulk of the 2010 swing in the House can be attributed to the sharp deterioration in economic conditions.

6 Conclusion

This paper studies how forward-looking politicians adjust their ideological positions in response to local economic conditions. I develop a dynamic model of electoral competition in which incumbents weigh current and future winning probabilities, recognizing that their policy stances are persistent over time. By linking unemployment shocks to these strategic adjustments, the paper provides a unified account of how economic downturns tighten competition, induce moderation, and ultimately reshape the composition and ideology of Congress. Absent this forward-looking behavior, one might misinterpret politicians' limited short-run movements as rigidity or dogmatism rather than as strategic anticipation of future conditions.

In the empirical analysis, I document two ways in which local economic conditions shape the US House. First, unemployment relates to composition: higher unemployment lowers incumbents' vote shares and, in competitive seats, reduces their win probabilities; worsening conditions also accelerate replacement in districts that have realigned. Second, unemployment relates to moderation: surviving incumbents adopt more centrist positions when unemployment rises.

I build a dynamic model of electoral competition where candidates are forward-looking, choose positions to maximize discounted winning probabilities, and face adjustment costs that tie current choices to past stances. Competition is explicit and incumbency carries an advantage that interacts with the economy—stronger in good times, weaker in bad times. The model reproduces key cross-sectional moments and delivers two mechanisms that mirror the empirical results: a composition effect (bad economic conditions associated with more challenger wins) and a moderation effect (incumbents move toward the center when competition intensifies).

The model helps interpret the 2010 midterm swing. The recession accounts for a 46-seat shift toward Republicans and reduces the Democratic share from 59% to 48%. Holding unemployment at normal, non-recession levels while allowing ideology to evolve explains only 8 seats. Thus, adverse economic conditions were roughly three times more important than ideological shifts for the 2010 realignment. I also quantify the asymmetric "punishment" of Democrats in 2010. Allowing bad economic conditions to favor Republican incumbents (by flipping their economic sensitivity parameter) raises their average probability of winning by about 17 percentage points, with the largest gains in left-leaning districts. This exercise lines up with the historical pattern: in 2010 voters punished the party perceived as "in charge," a feature the benchmark calibration does not capture.

In future work, I plan to extend the model to include two consecutive electoral cycles, with the first representing a presidential election year and the second a midterm. This structure allows the effects of candidates' positions to vary across cycles and provides a meaningful foundation for the state variable D, linking the president's party to the incentives faced by House candidates in each phase of the cycle.

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A Appendix - Robustness of Empirical Results

A.1 Correlation Between Unemployment and Incumbent Vote Share

I perform two robustness exercises to the specification in equation (1). In Table (8) I run the same regression with unemployment at the state level, instead of the usual unemployment at the congressional district level used in the body of the paper. The goal of this first robustness check is to increase the number of observations, since the state level unemployment is available before 2010.

Next in Table (9) I repeat the exercise for Senators instead of House Representatives and unemployment at the state level. The goal here is to argue there's nothing special about House Representatives. Unemployment harms congressmen in general.

Table (10) shows the results for the regression where the dependent variable is set to be the percent of votes the candidate gets in the election, as opposed to the share of votes. The percent of votes does not account for absenteeism. The results suggest that the fall in vote share due to high unemployment is associated with people abstaining from voting, rather than voting for the challenger candidate. Coefficients have the expected sign, but they are not significant.

I perform a robustness check to the linear probability model of equation (2). In Table (11) I use state-level unemployment to increase the number of observations. The coefficient associated with the interaction between the unemployment rate and the competitive seat dummy is negative across specifications.

A.2 Unemployment Weakens the Incumbency Advantage

Table (12) presents the estimates of the survival model of equation (3) for Senators instead of House Representatives. Although the results are less pronounced than for the House, the estimates in my preferred specification (column 4) yield the expected sigh, which is consistent with the main findings.

A.3 Unemployment is Associated with Moderate Positions

To address how general the moderation result is, I do three robustness checks to regression (4). Table (13) reports the regression using lagged unemployment. Table (14) re-estimates the model with state-level unemployment to increase the number of observations. Table (15) presents the results for Senators, providing a comparison with the House analysis.

Table 8: Candidates' Vote Share on District Unemployment - State Level Unemployment

	Dependent variable:			
	Vote Share (pp)			
	(1)	(2)	(3)	(4)
Unemployment rate (std.)	-0.388^{**}	-1.291^{***}	-1.574^{***}	0.353
	(0.152)	(0.183)	(0.180)	(0.309)
District Pres. VS	-0.340^{***}	-0.339^{***}	-0.323^{***}	-0.358^{***}
	(0.017)	(0.012)	(0.017)	(0.056)
District Pres. VS x GOP	0.575^{***}	0.534^{***}	0.446^{***}	0.413^{***}
	(0.032)	(0.023)	(0.031)	(0.079)
GOP dummy	-29.034^{***}	-26.774^{***}	-19.702^{***}	
	(1.732)	(1.213)	(1.683)	
CS			-0.319	-2.195
			(1.071)	(3.553)
CFscore			-4.239^{***}	-2.639^{***}
			(0.386)	(0.486)
CFscore x GOP			-0.194	-0.703
			(0.677)	(2.309)
Log total receipts			-1.137^{***}	-1.307^{*}
			(0.420)	(0.701)
Log number of givers			0.965^{***}	-0.068
			(0.329)	(0.527)
rGDP growth			-0.840^{***}	-0.001
			(0.207)	(0.246)
Inflation			1.077^{***}	-0.089
			(0.289)	(0.303)
Constant	46.801^{***}	40.998^{***}	51.800^{***}	29.540^{*}
	(0.669)	(0.584)	(4.333)	(16.409)
Cycle FE		✓	✓	✓
Tenure FE			✓	✓
Individual FE				✓
Observations	3,666	3,666	2,144	2,144
R^2	0.132	0.587	0.686	0.863
Note:				*p<0.1; **p<0.05; ***p<0.01

Note: Regressions are for incumbent House Representatives only. The unemployment rate is at the state level and it was scaled. Vote share is expressed in percents.

Table 9: Candidates' Vote Share on District Unemployment - Senators

	Dependent variable:			
	Vote Share (pp)			
	(1)	(2)	(3)	(4)
Unemployment rate (std.)	-0.907^{*}	-2.052^{***}	-2.208^{***}	0.083
	(0.484)	(0.505)	(0.463)	(0.698)
District Pres. VS	-0.270^{***}	-0.243^{***}	-0.263^{***}	-0.135
	(0.080)	(0.058)	(0.057)	(0.226)
District Pres. VS x GOP	0.444^{***}	0.446^{***}	0.401^{***}	-0.473
	(0.116)	(0.085)	(0.091)	(0.287)
GOP dummy	-22.838^{***}	-24.592^{***}	-21.241^{***}	
	(6.213)	(4.546)	(4.805)	
Log total receipts			-0.171	-2.777^{*}
			(0.876)	(1.573)
Log number of givers			0.110	0.585
			(0.631)	(0.848)
rGDP growth			-0.694	-0.930
			(0.540)	(0.652)
Inflation			0.050	-2.201^{***}
			(0.692)	(0.693)
Constant	43.465^{***}	36.573^{***}	43.109^{***}	64.207^{***}
	(3.802)	(3.013)	(9.045)	(20.510)
Cycle FE		✓	✓	✓
Individual FE				✓
Observations	277	277	161	161
R^2	0.061	0.528	0.672	0.972
Note:	*p<0.1; **p<0.05; ***p<0.01			

Note: Regressions are for incumbent Senators only. The unemployment rate is at the state level and it was scaled. Vote share is expressed in percents.

Table 10: Candidates' Percent of Votes on District Unemployment

	Dependent variable:			
	Percent of Votes (pp)			
	(1)	(2)	(3)	(4)
Unemployment rate (std.)	−0.117	−0.110	−0.413	−0.352
	(0.234)	(0.352)	(0.343)	(0.699)
District Pres. VS	−0.901***	−0.903***	−0.732***	−0.478***
	(0.028)	(0.029)	(0.032)	(0.104)
District Pres. VS x GOP	1.721***	1.753***	1.384***	0.545***
	(0.047)	(0.048)	(0.055)	(0.143)
GOP dummy	−80.040***	−81.883***	−66.776***	
	(2.427)	(2.487)	(2.948)	
CS			−8.019***	5.843
			(1.926)	(6.528)
CFscore			−9.368***	−8.145***
			(0.674)	(0.898)
CFscore x GOP			6.071***	−10.096**
			(1.223)	(4.274)
Log total receipts			0.150	2.153**
			(0.655)	(1.082)
Log number of givers			−0.289	−4.183***
			(0.528)	(0.876)
rGDP growth			0.076	−0.664
			(0.385)	(0.462)
Inflation			1.811***	0.103
			(0.425)	(0.497)
Constant	97.087***	96.783***	98.712***	63.225**
	(1.014)	(1.367)	(7.008)	(30.121)
Cycle FE		✓	✓	✓
Tenure FE			✓	✓
Individual FE				✓
Observations	2,118	2,118	2,110	2,110
R^2	0.422	0.434	0.511	0.757

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

Note: Regressions are for incumbent House Representatives only. The unemployment rate is at the congressional district level and it was scaled. The dependent variable is the percent of votes the candidate gets in the election.

Table 11: Winner Dummy on State Unemployment

	Dependent variable:			
	Winner Dummy			
	(1)	(2)	(3)	(4)
Unemployment rate (std.)	−0.004	0.018***	0.014***	0.005
	(0.003)	(0.005)	(0.005)	(0.008)
Competitive Seat	−0.209***	−0.206***	−0.211***	−0.153***
	(0.007)	(0.008)	(0.008)	(0.009)
Unemployment Rate × CS	−0.039***	−0.041***	−0.036***	−0.032***
	(0.007)	(0.007)	(0.007)	(0.007)
District Pres. VS	−0.001**	−0.001***	−0.001***	−0.002**
	(0.0003)	(0.0003)	(0.0003)	(0.001)
District Pres. VS × GOP	0.004***	0.004***	0.004***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
GOP dummy	−0.187***	−0.212***	−0.218***	−0.342***
	(0.033)	(0.033)	(0.033)	(0.095)
Log total receipts			0.020***	0.027***
			(0.007)	(0.008)
Log number of givers			−0.0004	0.008
			(0.007)	(0.008)
nGDP growth			−0.003	−0.005
			(0.004)	(0.005)
Constant	1.010***	1.031***	0.015	−0.416
	(0.012)	(0.018)	(0.228)	(0.312)
Cycle FE		✓	✓	✓
Tenure FE			✓	✓
Individual FE				✓
Observations	6,511	6,511	6,368	6,368
R^2	0.156	0.173	0.184	0.529
Note:				*p<0.1; **p<0.05; ***p<0.01

Note: Regressions are for incumbent House Representatives only. The unemployment rate is at the state level and it was scaled. The dependent variable is a dummy variable that equals 1 if the candidate won the election in the given cycle.

Table 12: Discrete-Time Hazard for Incumbent Replacement - Senators

	Dependent variable:			
	Incumbent Replaced (event dummy)			
	(1)	(2)	(3)	(4)
Unemployment rate (std.)	0.057	0.137	−0.020	0.113
	(0.139)	(0.187)	(0.233)	(0.239)
nGDP growth			−0.240	−0.028
			(0.204)	(0.259)
Rep→Dem dummy			0.537	0.778^{*}
			(0.384)	(0.429)
Duration FE		✓	✓	✓
Region FE				✓
Decade FE				✓
Observations	288	288	288	288
Note:	*p<0.1; **p<0.05; ***p<0.01			

Note: The dependent variable is a dummy equal to 1 if the incumbent is replaced by a candidate from the opposite party in a given cycle after the district's presidential vote share crosses the 50% threshold, and 0 otherwise. Estimates are from logit regressions; standard errors in parentheses.

Table 13: Incumbent Moderation on Lagged District Unemployment

	Dependent variable:			
	|CFscore| (std.)			
	(1)	(2)	(3)	(4)
Unemployment rate (std.)	-0.262^{***}	-0.370^{***}	-0.017^{*}	-0.024
	(0.019)	(0.024)	(0.010)	(0.017)
Inflation (std.)			-0.024	-0.021
			(0.016)	(0.018)
rGDP growth (std.)			0.025^{**}	0.027^{*}
			(0.012)	(0.015)
District Pres. VS			0.018	1.383^{***}
			(0.024)	(0.315)
District Pres. VS × GOP			-0.033^{***}	-0.016
			(0.011)	(0.015)
GOP dummy			0.040^{***}	0.046^{***}
			(0.010)	(0.015)
Log total receipts			0.918^{***}	0.354^{***}
			(0.010)	(0.032)
Log number of givers			-0.043^{***}	-0.038
			(0.014)	(0.043)
|CFscore| L1			0.079^{***}	-0.062
			(0.021)	(0.056)
Constant	0.355^{***}	0.652^{***}	0.584^{***}	-1.498
	(0.019)	(0.048)	(0.187)	(1.214)
Cycle FE		✓	✓	✓
Tenure FE			✓	✓
Individual FE				✓
Observations	2,153	2,153	2,093	2,093
R^2	0.083	0.115	0.894	0.948
Note:		*p<0.1; **p<0.05; ***p<0.01		

Note: The dependent variable is the standardized absolute value of CFscores, where higher values indicate less moderation. The unemployment rate is measured at the congressional district level. Controls include state-level inflation and real GDP growth, district presidential vote share and its interaction with party, a party dummy, campaign finance variables, and the lagged CFscore. Standard errors in parentheses.

Table 14: Incumbent Moderation on State Unemployment

	Dependent variable:			
	|CFscore| (std.)			
	(1)	(2)	(3)	(4)
Unemployment rate (std.)	-0.105^{***}	-0.093^{***}	0.014^{**}	0.004
	(0.010)	(0.016)	(0.007)	(0.010)
nGDP growth (std.)			0.011^{*}	0.010
			(0.006)	(0.007)
District Pres. VS			0.065^{***}	0.898^{***}
			(0.012)	(0.073)
District Pres. VS $\times$ GOP			-0.042^{***}	-0.071^{***}
			(0.008)	(0.009)
GOP dummy			0.047^{***}	0.076^{***}
			(0.007)	(0.009)
Log total receipts			0.896^{***}	0.323^{***}
			(0.005)	(0.012)
Log number of givers			-0.018^{***}	-0.020
			(0.006)	(0.015)
|CFscore| L1			0.063^{***}	-0.011
			(0.011)	(0.020)
Constant	0.008	-0.311^{***}	-0.074	0.191
	(0.010)	(0.047)	(0.349)	(0.420)
Cycle FE		✓	✓	✓
Tenure FE			✓	✓
Individual FE				✓
Observations	9,520	9,520	8,525	8,525
R^2	0.011	0.120	0.883	0.929
Note:				*p<0.1; **p<0.05; ***p<0.01

Note: The dependent variable is the standardized absolute value of CFscores, where higher values indicate less moderation. The unemployment rate is measured at the state level. Controls include state-level inflation and real GDP growth, district presidential vote share and its interaction with party, a party dummy, campaign finance variables, and the lagged CFscore. Standard errors in parentheses.

Table 15: Incumbent Moderation on State Unemployment - Senators

	Dependent variable:			
	|CFscore| (std.)			
	(1)	(2)	(3)	(4)
Unemployment rate (std.)	-0.132^{***}	-0.098^{***}	-0.039	0.011
	(0.022)	(0.029)	(0.031)	(0.032)
nGDP growth (std.)			-0.005	-0.002
			(0.028)	(0.020)
District Pres. VS			0.947^{***}	1.043^{***}
			(0.046)	(0.350)
District Pres. VS $\times$ GOP			-0.088^{***}	-0.123^{***}
			(0.027)	(0.021)
GOP dummy			0.139^{***}	0.148^{***}
			(0.023)	(0.018)
Log total receipts			-0.274^{***}	0.077
			(0.034)	(0.052)
Log number of givers			0.377^{***}	-0.045
			(0.047)	(0.066)
Constant	-0.001	-0.261^{**}	-0.720^{**}	-0.286
	(0.022)	(0.106)	(0.292)	(0.494)
Cycle FE		✓	✓	✓
Individual FE				✓
Observations	2,083	2,083	1,580	1,580
R^2	0.017	0.156	0.390	0.832
Note:			*p<0.1; **p<0.05; ***p<0.01	

Note: The dependent variable is the standardized absolute value of CFscores, where higher values indicate less moderation. The unemployment rate is measured at the state level. Controls include state-level inflation and real GDP growth, district presidential vote share and its interaction with party, a party dummy, campaign finance variables. Standard errors in parentheses.

B Appendix - Model

B.1 One Period Model

In this appendix I present the proofs for the static model. Without loss of generality, consider the Democrat candidate is the incumbent and the Republican candidate is the challenger. From equation (7) define the index $t(p^{\mathrm{D}}, p^{\mathrm{R}})$ as follows.

$$
\begin{aligned}
t(p^{\mathrm{D}}, p^{\mathrm{R}}) &= \bar{u}_{\mathrm{R}} - \bar{u}_{\mathrm{D}} \\
&= \alpha_1[(p^{\mathrm{D}} - z^{\mathrm{D}})^2 - (p^{\mathrm{R}} - z^{\mathrm{D}})^2] + \gamma[(p^{\mathrm{D}} + p^{\mathrm{D}}_{-1})^2 - (p^{\mathrm{R}} - p^{\mathrm{R}}_{-1})^2] - (v_I + \alpha_2 z^{\mathrm{E}}) + \alpha_3 z^{\mathrm{D}}
\end{aligned}
$$

Store its derivatives:

$$
\begin{aligned}
\frac{\partial t(p^{\mathrm{D}}, p^{\mathrm{R}})}{\partial p^{\mathrm{D}}} &= 2\big[\alpha_1(p^{\mathrm{D}} - z^{\mathrm{D}}) + \gamma(p^{\mathrm{D}} - p^{\mathrm{D}}_{-1})\big] \\
\frac{\partial t(p^{\mathrm{D}}, p^{\mathrm{R}})}{\partial p^{\mathrm{R}}} &= -2\big[\alpha_1(p^{\mathrm{R}} - z^{\mathrm{D}}) + \gamma(p^{\mathrm{R}} - p^{\mathrm{R}}_{-1})\big]
\end{aligned}
$$

The probability of winning is logistic. Let $f(x) = \frac{1}{1+\exp\{-x\}}$ with $f' = f(1-f)$ and $f'' = f'(1-2f)$. Now the period utility reads:

$$
\begin{aligned}
\mathrm{PU}^{\mathrm{D}}(p^{\mathrm{D}}, p^{\mathrm{R}}; s) &= f[t(p^{\mathrm{D}}, p^{\mathrm{R}})] \cdot \exp\{-v^{\mathrm{O}}(p^{\mathrm{D}} - p^{\mathrm{D}*})^2\} \\
\mathrm{PU}^{\mathrm{R}}(p^{\mathrm{D}}, p^{\mathrm{R}}; s) &= f[-t(p^{\mathrm{D}}, p^{\mathrm{R}})] \cdot \exp\{-v^{\mathrm{O}}(p^{\mathrm{R}} - p^{\mathrm{R}*})^2\}
\end{aligned}
$$

The static NE satisfies the following system of equations:

$$
\begin{cases}
f[-t(p^{\mathrm{D}}, p^{\mathrm{R}})] & \cdot\big[\alpha_1(p^{\mathrm{D}} - z^{\mathrm{D}}) + \gamma(p^{\mathrm{D}} - p^{\mathrm{D}}_{-1})\big] + v^{\mathrm{O}}(p^{\mathrm{D}} - p^{\mathrm{D}*}) = 0 \\
f[t(p^{\mathrm{D}}, p^{\mathrm{R}})] & \cdot\big[\alpha_1(p^{\mathrm{R}} - z^{\mathrm{D}}) + \gamma(p^{\mathrm{R}} - p^{\mathrm{R}}_{-1})\big] + v^{\mathrm{O}}(p^{\mathrm{R}} - p^{\mathrm{R}*}) = 0
\end{cases}
$$

B.2 Dynamic Model

While I cannot establish convergence of the algorithm analytically, in practice it consistently converges across specifications. To verify this, I perform a robustness exercise varying the initial guesses for the value and policy functions. In all cases, the algorithm converges to the same fixed point, suggesting that the numerical procedure is stable. For a tolerance level of $\epsilon = 1e^{-6}$ and 2178 grid points (I discretize shocks in three points each), I make 100 random guesses and perform simple value function iteration. I create the random guesses as follows. For each $s \in S$ I calculate the worst possible value of the period utility (assuming both candidates try to minimize it) on the grids of policies p^{D} and p^{R}, this defines a lower bound. I do the opposite to find an upper bound. Finally the initial guess for state $s \in S$ is random in between those bounds. Table (16) show some statistics across these 100 solutions.

Table 16: Diagnostics of the VFI Algorithm

	Mean	**Max**
Absolute pairwise difference	2.3×10^{-3}	1.3×10^{-2}
Relative pairwise difference	0.27%	1.54%
Success rate	100%	
Mean # of iterations	58.39	

Note: This table reports convergence diagnostics for the value function iteration algorithm. The algorithm converges in all runs with tolerance 10^{-6}.