Mobile Broadband and the Decline of Incumbency Advantage

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Abstract

Incumbency advantage in U.S. congressional elections has been a well-established feature of American politics. Since the late 2000s, this advantage has significantly declined, falling from a longstanding average of 10 percentage points to just 3, as we document using a regression discontinuity design. We show that this decrease was driven primarily by the expansion of mobile broadband. Both Democrats and Republicans were affected, though the decline was initially greater for the party holding the presidency at the time. Mobile broadband disadvantaged incumbents and benefited challengers. It improved voter knowledge of both, increased disapproval of incumbents, and enhanced challengers' fundraising capacity.

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I Introduction

For decades, the incumbency advantage in U.S. congressional elections has been among the most consistent and well-documented findings in political science. Incumbent members of Congress have historically achieved high reelection rates, supported by name recognition (Druckman et al., 2020), fundraising networks and campaign spending (Levitt, 1994; Levitt and Wolfram, 1997; Fouirnaies and Hall, 2014), institutional resources (Fiorina, 1977), and voter responsiveness to candidate-specific traits (Cox and Katz, 1996; Ansolabehere et al., 2000).[1] In recent election cycles, however, this advantage has weakened. An increasing number of incumbents have lost reelection, including six-term incumbent Matt Cartwright and five-term incumbent Sean Patrick Maloney, then chair of the Democratic Congressional Campaign Committee. In New Hampshire's 1st Congressional District, control shifted between Democrat Carol Shea-Porter and Republican Frank Guinta four times during the 2010s. These developments suggest that incumbency no longer secures electoral success to the extent it once did.

This paper is the first to document this phenomenon using the state-of-the-art regression discontinuity design developed by Lee (2008) and examine its underlying causes. We begin by confirming the well-documented findings of the existing literature: before the late 2000s, incumbents received a 9–12 percentage point higher vote share than their challengers, translating into roughly a 50 percentage point higher probability of winning the next election (Cox and Katz, 1996; Gelman and King, 1990; Lee, 2001, 2008). We then show that since the late 2000s, this advantage has steadily declined, reaching just 3 percentage points in vote share in the early 2020s. We then conduct a difference-in-discontinuities event-study analysis showing that the erosion of incumbency advantage can be explained by the rapid diffusion of mobile broadband internet in the late 2000s, when mobile broadband coverage expanded from zero congressional districts in 2006 to full coverage by 2012. By contrast, the decline was unrelated to the concurrent effects of the Great Recession, as measured by local unemployment and housing prices. Mobile broadband affected incumbency advantage for both major political parties, though its effects were initially larger for the party controlling the White House, Republicans in 2008 and Democrats in 2010. As mobile broadband later became ubiquitous, incumbency advantage effectively disappeared for both parties.

We examine two channels through which mobile broadband disadvantaged incumbents and benefited challengers in congressional elections: information and campaign financing. First, it

[1] Although gerrymandering is often cited as a contributor to incumbency advantage, the literature provides little supporting evidence (Gelman and King, 1994; Ansolabehere et al., 2000).

increased disapproval of incumbents and enabled challengers to communicate more effectively with voters. Second, it substantially strengthened challengers' fundraising capacity, primarily by raising the number of small contributions to their campaigns.

By documenting that the expansion of mobile broadband explains the dramatic decline in incumbency advantage of U.S. congressional representatives, marking a fundamental change in the electoral environment and the beginning of a more competitive era in American politics, we contribute to two literatures.

First, we add to the research on incumbency advantage in the United States. Earlier work documented the persistent and sizable incumbency advantage in U.S. congressional elections before the mobile broadband era (Cox and Katz, 1996; Gelman and King, 1990; Lee, 2001, 2008).[2] While political scientists have noted a recent decline (Jacobson, 2015, 2021; Rogers, 2023), these studies focus on the advantage of individual candidates relative to their party, overlooking party-level incumbency advantage. Our paper is the first to document the decline in party-level incumbency advantage using the state-of-the-art regression discontinuity methodology developed by Lee (2008). We also study how incumbency advantage has evolved within each of the two major parties, an analysis made possible by the stability of the U.S. two-party system, in which former incumbents often return as challengers.[3]

Second, we contribute to the literature on the political effects of the spread of mobile broadband internet. Previous research shows that mobile broadband and the social media it enabled affect politics through multiple mechanisms (see surveys by Zhuravskaya et al., 2020; Aridor et al., 2024). By allowing fast internet access directly from smartphones, mobile broadband increased time spent online and accelerated the adoption of social media. On the one hand, this gave the opposition new tools to expose corruption and incompetence among political elites, particularly in contexts where traditional media is controlled (Enikolopov et al., 2018; Guriev et al., 2021; Enríquez et al., 2024). On the other hand, as Haidt and Rose-Stockwell (2019) argue, it fostered more negative attitudes toward the status quo: the advertising-based business model of social media platforms, designed to maximize attention, pushes them to prioritize divisive, negative, and emotionally charged content (Guess et al., 2023; Milli et al., 2025). Such content increases user engagement (Kätsyri et al., 2016; Brady et al., 2017; Beknazar-Yuzbashev et al., 2024, 2025; Braghieri et al., 2024; Robertson et al., 2023), and in extreme cases, negative online sentiment spills over

[2] Fowler and Hall (2014) found a similar magnitude of advantage in state legislative elections through 2008.

[3] Dano et al. (2025) study France's multi-party system and show that incumbency advantage results in endogenous party and candidate entry into elections.

into offline hate crimes and xenophobia (Bursztyn et al., 2024; Müller and Schwarz, 2021, 2023). Consequently, voters with access to mobile broadband face substantially greater exposure to both accurate and false news criticizing the status quo and incumbents than before the age of social media. Social media also improves challengers' fundraising prospects, further lowering barriers to political competition (Petrova et al., 2021). Consistent with these mechanisms, Guriev et al. (2021) show that the expansion of mobile broadband reduced self-reported confidence in national governments across the globe. They also find that mobile broadband lowered incumbent parties' vote shares in parliamentary elections across Europe, while Manacorda et al. (2025) show that it increased voter support for European parties campaigning on nationalism and hostility toward immigrants and minorities. In addition, Melnikov (2025) finds that mobile broadband expansion contributed to greater political polarization in the United States. This paper links the diffusion of mobile broadband to the decline in incumbency advantage in the United States.

The rest of the paper is structured as follows. Section II describes the data used in this study. Section III outlines the identification strategy. Section IV presents the empirical findings. Section V concludes.

II Data

This section describes the main data sources used in the analysis. Appendix Section A.I provides further details and definitions of secondary variables. Appendix Table A1 presents the summary statistics for the variables used in the analysis.

U.S. congressional elections.— We use data from the MIT Election Data and Science Lab, which cover congressional elections from 1976 to 2022, and from Dave Leip's Atlas of U.S. Presidential Elections for 2024. Both sources report candidate-level information, including party affiliation, vote counts, and total votes cast, disaggregated by congressional district and year. From these data, we construct vote shares for the two major parties in each district-year and identify the party controlling each district in each period.

Mobile broadband coverage.—We measure mobile broadband internet coverage from 2007 to 2023 using annual maps from Collins Bartholomew's *Mobile Coverage Explorer*, which collects data from operators using the GSM (Global System for Mobile Communications) standard. The two largest operators in this dataset are AT&T and T-Mobile, together accounting for more than half of the U.S. mobile market (Statista, 2023). From the iPhone's launch in 2007 until 2011, AT&T held an exclusivity agreement with Apple, requiring all U.S. iPhone users to subscribe to

AT&T.

The dataset provides 1×1-kilometer grid cells indicating the presence of 3G, 4G, or 5G coverage (collectively referred to as "mobile broadband"). From these data, we compute the share of each congressional district's territory with coverage in each year. Appendix Figure A1 maps mobile broadband expansion in the contiguous United States for two-year periods aligned with congressional elections between 2008 and 2014. Appendix Figure A2 reports both the share of districts with access to mobile broadband and the average territorial coverage within districts. By 2011, all congressional districts had GSM 3G coverage.

In the early years of mobile broadband, Verizon and Sprint—the two other major U.S. mobile operators—used the alternative CDMA standard for mobile internet provision, which is not covered in the *Mobile Coverage Explorer*. On CDMA devices, user identification with the carrier is performed not via a SIM card, as on GSM devices, but through the hardware of the device itself, effectively tying Verizon and Sprint customers to the phones that they initially purchased. Although CDMA internet coverage was widely available across the United States before the rollout of GSM 3G networks, Verizon and Sprint customers could not take full advantage of mobile internet due to the inferiority of early CDMA-compatible devices (e.g., Motorola Droid, BlackBerry Bold 9650, HTC Hero). These were primarily designed for SMS texting, emailing, and limited browsing, making them poorly suited for social media use or sharing images and videos. Early CDMA devices did not support simultaneous voice and data, lacked many of the iPhone's innovative features, and offered far fewer apps than Apple's App Store (Ganapati, 2009; Hardy, 2010). The first modern CDMA-compatible smartphone in the United States was the iPhone 4S, introduced by Sprint and Verizon in 2011, when all U.S. congressional districts already had GSM mobile broadband.[4]

Cooperative Election Study (CES).—To analyze individual-level voting behavior, disapproval of the incumbents, and voters' knowledge of congressional candidates' policy positions, we draw on data from the Cooperative Election Study (CES) (Ansolabehere and Schaffner, 2024). For voting behavior, we use the Cumulative CES Common Content file (Kuriwaki, 2024). For knowledge of candidates' policy positions, we harmonized and cleaned the original CES surveys from 2006 to 2024.

Campaign Contributions.—The data on individual campaign contributions come from the Database on Ideology, Money in Politics, and Elections (DIME) (Bonica, 2024), which covers the period from 1980 to 2010.

[4]See Appendix Section A.I for more details about CDMA networks.

III Empirical Methodology

We estimate the party incumbency advantage using a regression discontinuity design (RDD) following Lee (2001, 2008). To trace the dynamics of incumbency advantage, beginning with the 1976 election cycle, we divide the sample into seven consecutive six-year periods, excluding redistricting years.[5] For each period, we estimate the following specification:

$$\begin{aligned} DemResult_{i,t} = \alpha_0 + \alpha_1\, DemWon_{i,t-1} + \alpha_2\, DemMargin_{i,t-1} \\ + \alpha_3\, DemMargin_{i,t-1} \times DemWon_{i,t-1} + \tau_t + \delta_i + \varepsilon_{i,t}, \end{aligned} \tag{1}$$

where i indexes congressional districts and t indexes election years. The dependent variable $DemResult_{i,t}$ is either the Democratic candidate's vote share or an indicator for whether the Democrat won.[6] The main regressor $DemWon_{i,t-1}$ is an indicator for whether the Democrat won the previous election (i.e., incumbency status). The running variable $DemMargin_{i,t-1}$ is the Democrat's margin of victory in the prior election. We control linearly for this vote margin and its interaction with incumbency status. Our parameter of interest α_1 captures the discontinuity at zero margin in the previous election and thus identifies incumbency advantage—the average electoral benefit of incumbency when party control is as-if randomly assigned in close races. We include election and district fixed effects (τ_t and δ_i) in the baseline specification and show that the results are robust to excluding them. To compare the average incumbency advantage before and after the introduction of mobile broadband, we estimate Equation (1) separately for two periods: 1976–2006, before any coverage, and 2012–2024, after all congressional districts had some coverage.

To ensure consistent district definitions across elections, in our main specification, we exclude election years corresponding to redistricting cycles, as well as observations from states that underwent court-mandated redistricting since the prior election. We also restrict attention to races with both a Democratic and a Republican candidate and to districts where the absolute value of the Democratic margin of victory in election $t-1$ was less than 20 percentage points. This cutoff corresponds to the average optimal bandwidth for vote share, calculated using the procedure of Calonico et al. (2014) and Calonico et al. (2020) separately for each of the seven six-year periods

[5] The elections included in each period are: Period 1: 1976, 1978, 1980; Period 2: 1984, 1986, 1988; Period 3: 1990, 1994, 1996; Period 4: 1998, 2000, 2004; Period 5: 2006, 2008, 2010; Period 6: 2014, 2016, 2018; Period 7: 2020, 2024. Including redistricting years (1982, 1992, 2002, 2012, 2022) yields similar results.

[6] Because the U.S. two-party system implies that one party's vote share almost fully determines the other's, the choice of party is immaterial in this specification. Following Lee (2008), we focus on Democrats.

(see Appendix Table A2). We also show that the results are robust to using period-specific optimal bandwidths rather than a single bandwidth across all periods.

To study how mobile broadband affected incumbency advantage, we estimate the following difference-in-discontinuities specification, which we implement as an event study. We interact dummies for leads and lags of mobile broadband availability with the incumbency indicator $DemWon_{i,t-1}$, while also controlling for the direct effects of mobile broadband and incumbency:

$$\begin{aligned} DemResult_{i,t} = &\sum_{k\neq -1} \beta_1^k \, MobileBroadband_{i,t+k} \times DemWon_{i,t-1} \\ &+ \beta_2 \, DemWon_{i,t-1} + \sum_{k\neq -1} \beta_3^k \, MobileBroadband_{i,t+k} \\ &+ \beta_4 \, DemMargin_{i,t-1} + \beta_5 \, DemMargin_{i,t-1} \times DemWon_{i,t-1} + \tau_t + \delta_i + \varepsilon_{i,t}, \end{aligned} \tag{2}$$

where $MobileBroadband_{i,t+k}$ is an indicator for whether district i had at least some mobile broadband coverage in period $t+k$.[7] The coefficients of interest are β_1^k, which estimate the effects of mobile broadband on incumbency advantage. Intuitively, the specification contrasts Democrats' electoral support in districts where Democrats barely won versus barely lost in the previous election, before and after mobile broadband became available, thereby identifying its effect on incumbency advantage.

Building on recent advances in staggered difference-in-differences designs (De Chaisemartin and D'Haultfœuille, 2020; Callaway and Sant'Anna, 2021; Goodman-Bacon, 2021; Sun and Abraham, 2021; Borusyak et al., 2024), our event-study analysis restricts the sample to elections that occurred before all congressional districts were treated, using the last-treated cohort as the control group. We implement the estimator of Sun and Abraham (2021), which is designed for event-study settings with staggered adoption and dynamic effects. By 2012, all districts had at least some mobile broadband coverage, with the territorial expansion of mobile networks nearly complete. Hence, the identifying variation in our analysis comes from the first two congressional elections following its introduction, in 2008 and 2010.

We next ask whether the overall decline in incumbency advantage was primarily driven by Democrats, Republicans, or both. To examine this heterogeneity, we adapt the framework of Lee (2008). For Democratic and Republican incumbents separately, we estimate the average vote

[7] We primarily focus on mobile broadband availability measured by whether a district has any coverage. This definition yields the most precise estimates, though the results are robust to alternative measures of treatment status.

margin in election t conditional on narrowly winning election $t-1$, controlling for the vote margin in $t-1$. Specifically, for each period, we estimate the analogue of Equation (1), replacing the outcome variable with $DemMargin_{i,t}$. We then calculate party-specific incumbency advantage as $DemIncAdv_t = \alpha_0 + \tau_t + \alpha_1$ and $RepIncAdv_t = -\alpha_0 - \tau_t$.[8] Intuitively, in the presence of incumbency advantage, incumbents who narrowly won election $t-1$ should, on average, secure a larger margin in the subsequent election. This approach lets us trace the evolution of party-specific incumbency advantage while remaining closely tied to the canonical RDD of Lee (2008). Notably, the sum of $DemIncAdv_t$ and $RepIncAdv_t$ equals α_1, the RDD coefficient from Equation (1) estimated with the same outcome variable.[9] We also apply this approach to compare incumbency advantage for the president's party and the party in opposition at the national level at the time of each congressional election.

Having analyzed how incumbency advantage evolved across parties, we next examine whether the spread of mobile broadband had differential effects on incumbents from the sitting president's party and from the opposition party at the national level. We estimate the triple-difference-in-differences specification, focusing on elections after 1996 and before 2012, to cover the initial stage of the mobile broadband expansion, as well as applying the same sample restrictions as before:

$$\begin{aligned} DemResult_{i,t} = {} & \gamma_1 \, MobileBroadband_{i,t} \times DemWon_{i,t-1} \times DemPresident_t \\ & + \gamma_2 \, MobileBroadband_{i,t} \times DemWon_{i,t-1} \times RepPresident_t \\ & + \gamma_3 \, DemWon_{i,t-1} \times DemPresident_t + \gamma_4 \, DemWon_{i,t-1} \times RepPresident_t \\ & + \gamma_5 \, MobileBroadband_{i,t} \times DemPresident_t + \gamma_6 \, MobileBroadband_{i,t} \times RepPresident_t \\ & + \gamma_7 \, DemMargin_{i,t-1} + \gamma_8 \, DemMargin_{i,t-1} \times DemWon_{i,t-1} + \tau_t + \delta_i + \varepsilon_{i,t}. \end{aligned} \tag{3}$$

The coefficients of interest γ_1 and γ_2 measure the effect of mobile broadband on Democratic incumbents' electoral performance when Democrats hold the presidency and when they are in the opposition, respectively. Because of the timing of broadband's rollout, presidential party variation comes from the transition between the Bush and Obama administrations as a result of the 2008 election.

[8] As in other specifications, we exclude redistricting years and states that underwent court-mandated redistricting since the previous election. We further restrict to contested elections between Democratic and Republican candidates in districts where the winning margin in $t-1$ was within 20 percentage points. For ease of interpretation, we omit district fixed effects (which would otherwise replace α_0).

[9] See Appendix A.II for a proof. The RDD coefficient for $DemMargin_{i,t}$ is twice that for $DemVoteShare_{i,t}$.

IV Results

IV.A Main results

Figure 1 summarizes the evolution of incumbency advantage between 1976 and 2024. The top panel plots estimates from Equation (1) by seven six-year periods: the left side displays the advantage in vote share, while the right side shows the corresponding increase in the probability of winning. Both measures of incumbency advantage were stable from the late 1970s through the mid-2000s but declined thereafter. The decline is sizable: incumbency advantage in vote share fell from an average of 10.6 percentage points in 1976–2004 to 3 percentage points in 2020–2024. The probability of winning fell from 52.1 percentage points in 1976–2004 to about 23.7 percentage points in 2006–2018, before partially rebounding to 45 percentage points in 2020–2024, a level still below the pre-broadband era. The bottom panel of Figure 1 presents the regression discontinuity plots for incumbency advantage in vote share before and after the spread of mobile broadband.

The decline in incumbency advantage is highly robust. The estimates in Figure 1 use the most restrictive sample with a full set of controls, while Appendix Table A3 shows similar results when excluding district fixed effects or including redistricting years. Appendix Figures A3 and A4 provide seven period-specific RDD plots with and without controls, confirming that the decline in incumbency advantage is not sensitive to specification choice.

To assess the role of mobile broadband in the decline of incumbency advantage, we estimate Equation (2). Figure 2 plots event-study estimates from the Sun and Abraham (2021) estimator: the left panel shows the effects on the vote share, and the right panel shows the impact on the probability of winning. Immediately after the arrival of mobile broadband, incumbents lost about 6–8 percentage points in vote share, and their probability of winning the election declined by more than 40 percentage points. By contrast, in the pre-mobile-broadband period, districts that would later receive broadband followed trends similar to those of the control group.

Appendix Table A4 reports the regression output underlying the estimates presented in Figure 2, which are based on the most restrictive sample with a full set of controls. It also shows that the results are robust to excluding district fixed effects and to using an alternative specification that assumes a time-invariant effect of mobile broadband.

Overall, the arrival of mobile broadband accounts for a decline in incumbency advantage comparable in magnitude to the total drop observed since the late 2000s.

IV.B Robustness, specification checks, and potential confounders for the main results

Candidate-level incumbency advantage.—There is a debate in political science whether incumbency advantage should be measured at the individual or the party level.[10] Because candidates' decisions to seek reelection may be endogenous, our main analysis focuses on party-level incumbency advantage. That said, our findings are also robust to restricting the sample to congressional races in which the incumbent sought reelection. Appendix Figures A5 and A6 replicate Figures 1 and 2 for this subsample, while Appendix Tables A5 and A6 report the corresponding regression estimates. The results show a similarly pronounced decline in incumbency advantage following the spread of mobile broadband in this subsample.[11]

McCrary test.—Consistent with prior work on U.S. incumbency advantage, we find no evidence of selective sorting at the regression discontinuity threshold. This conclusion is based on the density test proposed by McCrary (2008), applied separately to each of the seven six-year periods between 1976 and 2024 (see Appendix Figure A7).

District × election fixed effects.—Because mobile broadband coverage is measured at a finer spatial scale than congressional districts, we can test whether the decline in incumbency advantage was driven by local variation in broadband availability within each congressional race, while holding constant all race-specific factors, such as the identities of the candidates and the local political environment. We merge local mobile broadband availability with county-level electoral results from 1992 to 2024 and with survey-based voting data from the Cooperative Election Study (CES) (Ansolabehere and Schaffner, 2024) covering 2006 to 2024. We then estimate the effect of local broadband access on incumbent and challenger support, controlling for congressional district × election fixed effects.[12] The results confirm that incumbents lost significantly more electoral support in areas with greater mobile broadband access, even after accounting for the characteristics of specific electoral contests (Appendix Table A7). The point estimates at the county- and ZIP-code-levels are roughly half the size of the corresponding estimates in Figure 2

[10] Gelman and King (1990) highlight the personal, candidate-specific nature of incumbency advantage, whereas Lee (2008) demonstrates its persistence at the party level.

[11] As in other studies of candidate-level incumbency advantage in congressional elections, these estimates assume away the potential endogeneity in the incumbent's decision to run. Fowler and Hall (2014), for example, use state-level term limits as a source of exogenous variation in candidates' ability to stand for election. We cannot use this strategy because the U.S. Congress has no term limits.

[12] The regression specification is: $\textit{Incumbent/Challenger Result}_{l,t} = \textit{MobileBroadband}_{l,t} + \Phi_{i,t} + \varepsilon_{l,t}$, where l indexes subdistrict geographic units (i.e., counties or ZIP codes), whereas t indexes elections and i districts. $\Phi_{i,t}$ denotes district-election fixed effects.

and Table A4. This difference in magnitude suggests spillovers across local areas within the congressional districts. Voters commute and socialize across different parts of their districts, so mobile broadband in one area may influence voters who reside elsewhere.

Treatment timing.—To further support the claim that the decline in incumbency advantage in the United States was driven by the introduction of mobile broadband, we exploit variation in treatment timing across congressional districts. Most districts received coverage in either 2008 or 2010 (Appendix Figure A2). We therefore split the sample into two groups: districts treated before the 2008 election and those treated afterward, and examine the dynamics of incumbency advantage separately for each group. As shown in Appendix Figure A8, both groups exhibited similar incumbency advantage through the mid-2000s. In the late 2000s, however, their trajectories diverged: incumbency advantage remained stable in districts without mobile broadband coverage but declined in districts that gained coverage. From the 2010s onward, once all districts had coverage, incumbency advantage fell similarly in both groups, reinforcing the conclusion that mobile broadband played a central role in its decline.

The Great Recession.—An important potential confounder in our analysis is the Great Recession, triggered by widespread defaults on subprime mortgages, which could have differentially affected incumbents' electoral performance in 2008–2010. To show that the decline in incumbency advantage was not driven by the recession, we compare the effects of mobile broadband across congressional districts differentially exposed to the collapse of the housing bubble and subsequent rise in unemployment. Specifically, we split districts by whether they experienced a below- or above-median increase in unemployment between 2007 and 2010, or a below- or above-median decline in home values using Zillow data. In both cases, mobile broadband had similar effects on incumbents' performance, providing no evidence that the Great Recession determined our results (Appendix Tables A8 and A9).

Period-specific optimal bandwidth.—The choice of the optimal bandwidth, whether for the whole sample or by sub-periods, does not affect our results. As noted earlier, to ensure that our findings are not driven by different bandwidth choices across periods, our baseline regressions restrict the sample to observations where the incumbent party's margin of victory in election $t-1$ is less than 20 percentage points. This threshold corresponds to the average optimal bandwidth computed across the seven six-year periods using the procedure of Calonico et al. (2014) and Calonico et al. (2020). In Appendix Tables A10 and A11, we apply period-specific optimal bandwidths and replicate Appendix Tables A3 and A4, respectively. The results remain very similar.

IV.C Heterogeneity by party

We next examine whether the expansion of mobile broadband had differential effects on Democratic and Republican incumbents. We find no evidence of such differences. Specifically, we estimate the party-specific incumbency advantage—as defined in Section III—for two periods: in the twenty years before the arrival of mobile broadband (1988–2006) and in the ten most recent years, after all the districts had full coverage (2012-2024). Panel A of Figure 3 plots these estimates by party and shows that the eventual decline in incumbency advantage was similar across parties, with both Democrats and Republicans experiencing a decline in vote margins of 7–8 percentage points. The difference between the magnitudes of the decline in incumbency advantage between the two parties is precisely zero. Appendix Figure A9 presents the detailed evolution of party-level incumbency advantage from 1988 to 2024, by four-year periods corresponding to presidential terms.

Prior research shows that the digital age has contributed to a "nationalization" of political news (Fischer et al., 2020; Jaidka et al., 2023) and of political discourse in local elections in the U.S. (Jacobson, 2015), with congressional races increasingly shaped by national-level dynamics. Guriev et al. (2021) show that the subnational expansion of mobile broadband reduced public confidence in national governments. If social media discourse enabled by mobile broadband centers primarily on national politics, then disillusionment with the national government should first reduce electoral support for congressional incumbents from the president's party, before broadening into a more general erosion of voter confidence in incumbents from both major parties.

Consistent with this hypothesis, we find that in the years following the introduction of mobile broadband, incumbency advantage declined mainly for candidates from the president's party. To show this dynamic, we estimate party-specific incumbency advantage by consecutive four-year presidential terms from 1988 to 2024 and plot the results separately for incumbents from the president's party and the opposition. The estimates are presented in Panel B of Figure 3. Before 2018, the decline in incumbency advantage was concentrated among incumbents from the president's party.[13] In later years, incumbency advantage converged toward zero for both parties.

To test whether the expansion of mobile broadband explains this pattern, we examine whether it differentially affected incumbency advantage for candidates from the president's party relative

[13] Appendix Figure A9 illustrates the same pattern by presenting the dynamics of party-level incumbency advantage over time. During the period of initial mobile broadband expansion, in George W. Bush's second term, Republican congressional incumbents experienced a substantial decline in incumbency advantage, while Democrats maintained previous levels. In contrast, during Barack Obama's first term, Democratic congressional incumbents' advantage declined sharply, whereas Republicans' advantage rebounded.

to the opposition in the early years of expansion, i.e., before 2011. Figure 4 plots regression discontinuity estimates for four types of congressional districts and election observations—defined by broadband availability in a district and the party in the White house—based on Equation (3) with full controls.[14]

Panel A of Figure 4 shows that the arrival of mobile broadband resulted in a major reduction in incumbency advantage for the party of the sitting president: incumbency advantage declined from approximately 10 percentage points before mobile broadband to about 1 percentage point, becoming statistically insignificant. Panel B demonstrates the initial null effect of mobile broadband on incumbents from the opposition party: even after the arrival of mobile internet, incumbency advantage remained large and statistically significant through 2010; the decline was only 1.5 percentage points and not statistically different from zero. These results indicate that in its early years (before 2011), mobile broadband primarily reduced incumbency advantage for candidates from the president's party.

IV.D What changed after the emergence of mobile broadband?

How did mobile broadband affect incumbents and challengers? To address this question, we first use the Cooperative Election Study (Ansolabehere and Schaffner, 2024), which includes questions on respondents' disapproval of their congressional representative as well as whether they can describe the ideologies of the incumbent representative and their challenger. When feasible, we pool responses to the questions about incumbents and challengers (specifically, those related to knowledge of candidates' ideology) and regress these responses on the respondent's ZIP code mobile broadband coverage, interacted with an indicator for whether the question concerns the incumbent or the challenger. We control for year-specific linear trends in the Democratic Party's vote margin in the district in the previous election, separately for Democratic and Republican incumbents, and for questions concerning the incumbent and the challenger. We further include district-by-party and year-by-party fixed effects, separately for questions about the incumbent and the challenger. We apply the same sample restrictions as in the rest of the analysis, focusing on elections featuring both a Democratic and a Republican candidate in districts that did not experience redistricting, and where the margin of victory in the previous elections was less than 20 percentage points.

In Column 1, we show that mobile broadband increased disapproval of congressional incumbents, consistent with the results of Guriev et al. (2021) for national governments worldwide. As

[14] Appendix Table A12 reports the triple-difference estimates from Equation (3).

this question concerns politicians currently in office, the data contain no information on disapproval of challengers. We find that the disapproval of incumbents increased by 2.2 percentage points with the arrival of mobile broadband in a respondent's ZIP code, representing a 6% increase relative to the mean of 37.2%. Column 2 examines respondents' knowledge of the policy positions of incumbents and challengers. The estimated effects are positive and significant for both, indicating that mobile broadband makes voters better informed about both types of candidates. Specifically, the ability to describe an incumbent's ideology increased by 1.8 percentage points relative to a mean of 55%, while the ability to describe a challenger's ideology increased by 2.4 percentage points from a mean of 39%.

Second, we analyze the effect of mobile broadband on individual campaign contributions using data from the Database on Ideology, Money in Politics, and Elections (Bonica, 2024). Following Zytynski (2025), we consider both all individual contributions and small individual contributions of $150 or less. Using Poisson Pseudo-Maximum Likelihood (Correia et al., 2020) to account for the presence of zeros in the data (Chen and Roth, 2024), we estimate the effects of mobile broadband in the congressional district on the number and value of both types of contributions received by incumbents and challengers in each congressional race. Results are reported in Columns 3–6 of Table 1. The unit of analysis is the congressional district, and in all other respects the specification matches that in the first two columns.

For all outcomes, the coefficients on district mobile broadband coverage are positive for both types of candidates, though the point estimates are much larger for challengers than for incumbents, and the effects are statistically significant only in the case of challengers. While we cannot reject the hypothesis that incumbents and challengers benefited equally because the estimates for incumbents are imprecise, the results provide suggestive evidence that mobile broadband helped challengers narrow the fundraising gap with incumbents. The strongest effects emerge for small contributions to challengers' campaigns: their number increased by a factor of 4, and their total amount increased by a factor of 5.4 (Columns 5 and 6).

Overall, the introduction of mobile broadband reduced incumbents' popularity and enhanced challengers' ability to communicate with voters and to fund their campaigns, potentially narrowing the fundraising gap between incumbents and challengers.

V Conclusion

We demonstrate that party-level incumbency advantage in U.S. congressional elections has declined sharply since the late 2000s, a change largely driven by the introduction and rapid expansion of mobile broadband internet. Initially concentrated among incumbents from the president's party, the effects have since extended to both major parties, signaling a structural shift in American electoral politics. Mobile broadband increased disapproval of incumbents, presumably by delivering negative information about them to voters. It also improved voters' knowledge of challengers and enhanced challengers' ability to raise campaign funds, eroding the longstanding informational and financial advantages of incumbency.

These findings point to mobile broadband as a transformative technology in U.S. elections, one that disrupted entrenched patterns of political advantage. However, by increasing representatives' electoral vulnerability, it may also have increased their reliance on presidential support. More broadly, our results suggest that mobile broadband and social media platforms amplify voices critical of incumbents and the political status quo, reshaping the dynamics of democratic accountability.

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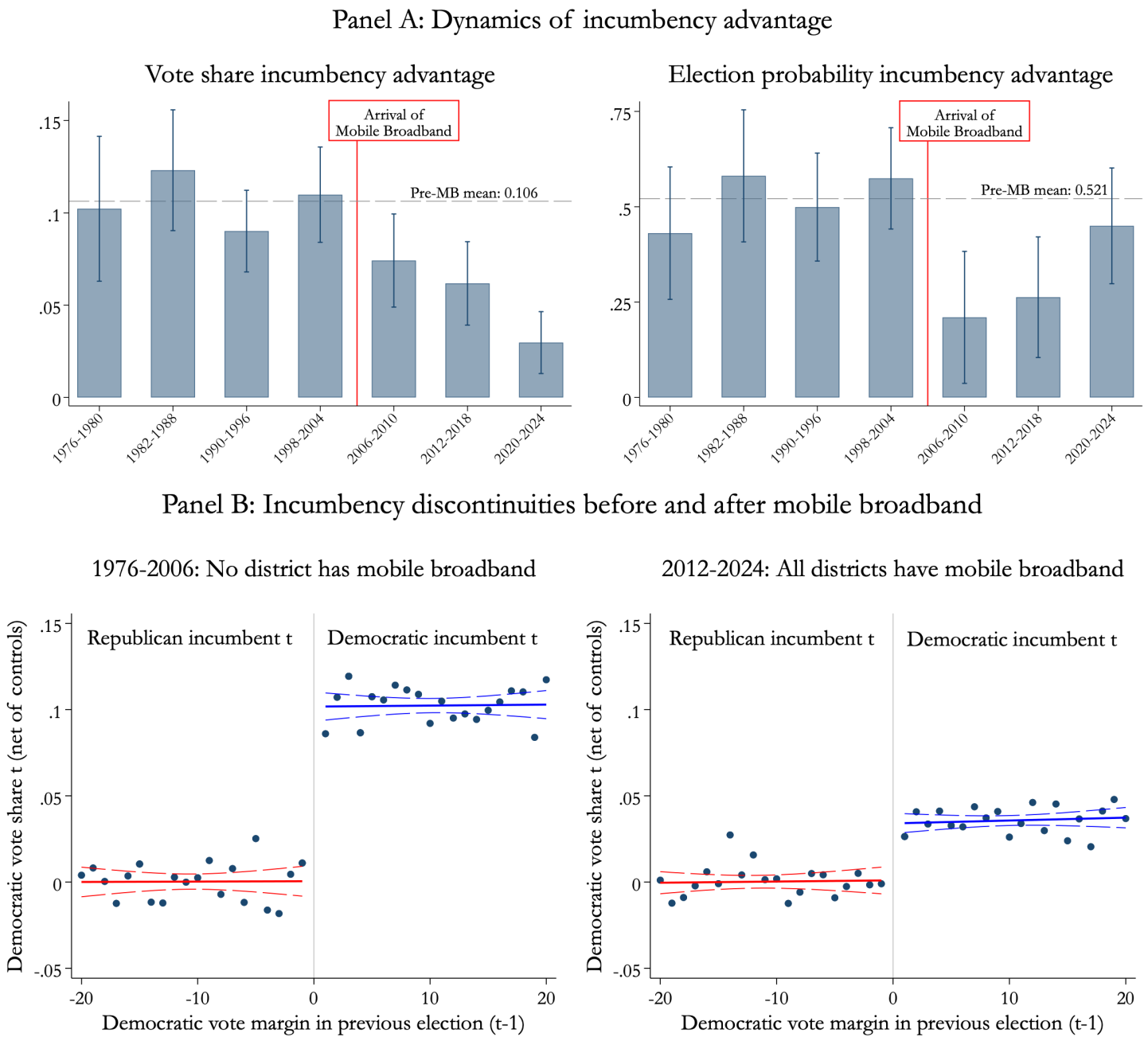

Figure 1: Decline in Incumbency Advantage Over Time

Note: MB = Mobile Broadband. Panel A of the figure presents the results of estimating Equation (1) for different time periods. Corresponding regression estimates are presented in Columns 4 and 8 of Appendix Table A3. Panel B presents the regression discontinuity plots for vote share incumbency advantage, before any and after full mobile broadband coverage, net of all controls. It also presents the mean dependent variable by 1 percentage point bins of electoral margin at t-1. The sample consists of elections featuring both a Democratic and a Republican candidate in districts where the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$, and where the state did not experience redistricting between elections at time $t-1$ and time t. Controls include year and congressional district fixed effects and linear trends in the Democratic Party's vote margin in the congressional district in period $t-1$, separately for races that Democrats won and lost and for each time period. The standard errors are corrected for clusters at the level of the congressional districts. Both panels present 90% confidence intervals.

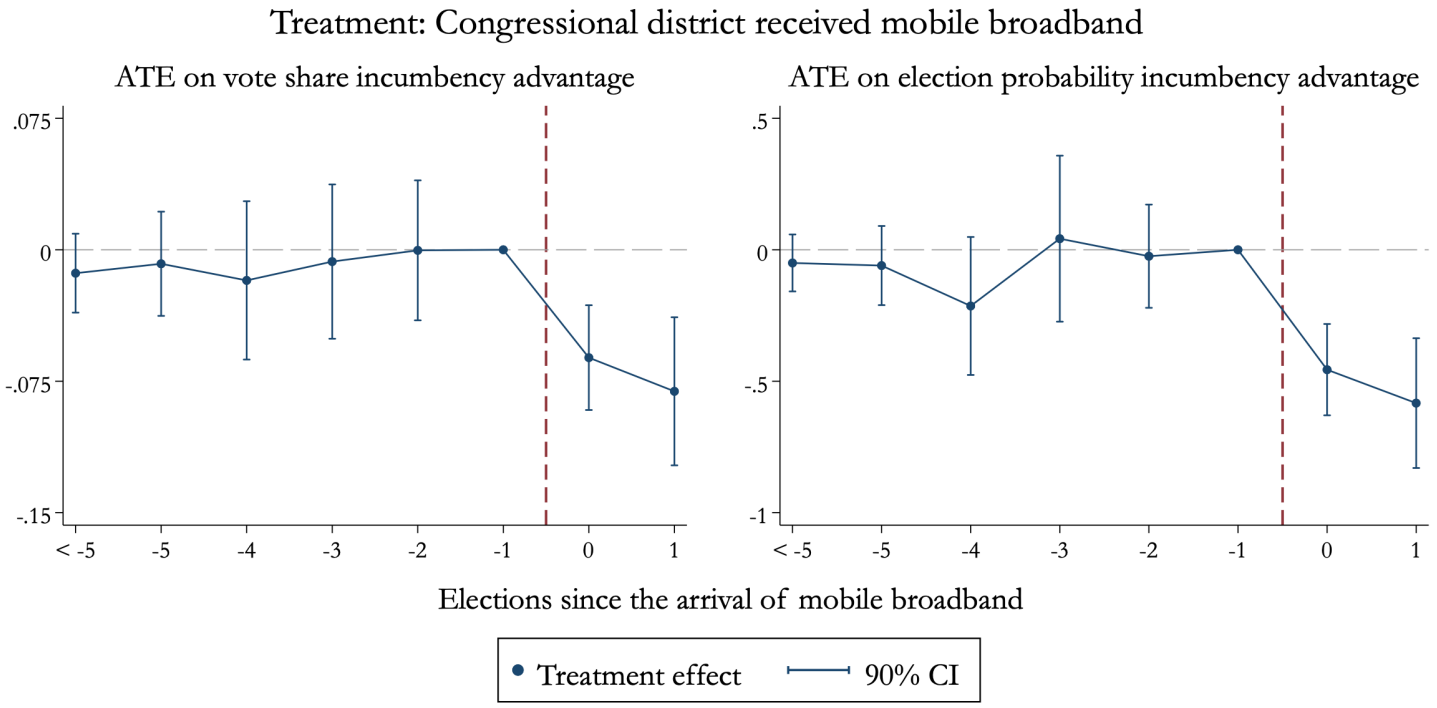

Figure 2: Mobile Broadband and Incumbency Advantage

Note: The figure presents the results of estimating Equation (2) for the incumbency advantage in vote share (left) and election probability (right) using the Sun and Abraham (2021) estimator. Corresponding regression estimates are presented in Columns 4 and 8 of Appendix Table A4. The sample consists of elections prior to 2012 featuring both a Democratic and a Republican candidate in districts where the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$, and where the state did not experience redistricting between elections at time $t-1$ and time t. Controls include year and congressional district fixed effects, linear trends in the Democratic Party's vote margin in the congressional district in period $t-1$ (separately for races that Democrats won and lost), *Election win in period* $t-1$, and the lags and leads of the treatment variable. The standard errors are corrected for clusters at the level of the congressional districts.

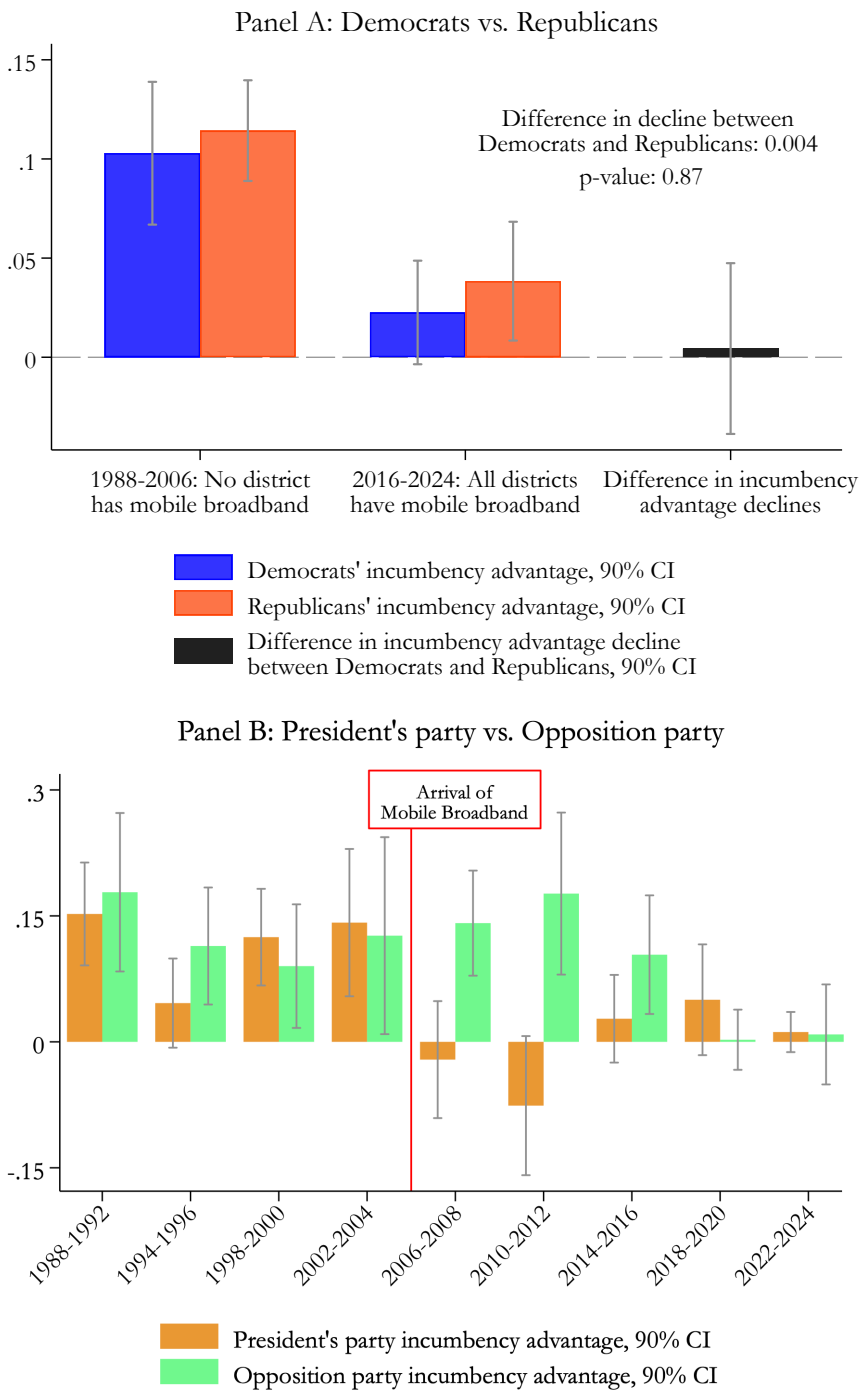

Figure 3: Incumbency Advantage, by Party and Presidency

Note: The figure presents the heterogeneity analysis of the evolution of incumbency advantage (Figure 1) by party. As discussed in Section III, the analysis is conducted separately for Democratic and Republican candidates (top panel) and for incumbents from the sitting president's party and the opposition party (bottom panel). Controls include period-specific linear trends in the vote margin for the respective outcome variable in congressional district i in period $t-1$ (separately for races that Democrats won and lost). The sample consists of elections featuring both a Democratic and a Republican candidate in districts where the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$, and where the state did not experience redistricting between elections at time $t-1$ and time t. The standard errors are corrected for clusters at the level of the congressional districts.

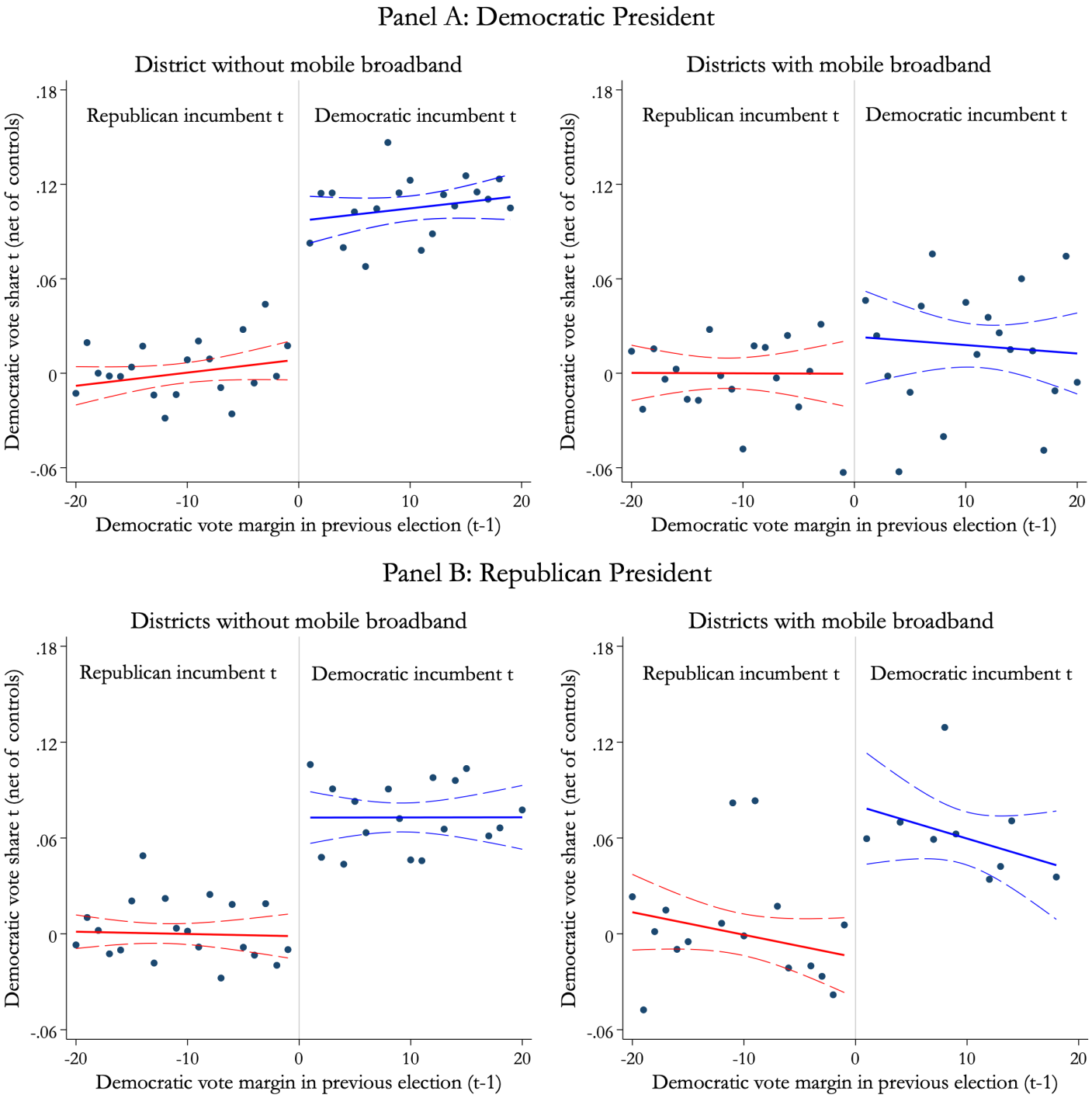

Figure 4: Initial Effects of Mobile Broadband (until 2010), by own vs. opposing party in the White House

Note: The figure presents the regression discontinuity plots for the vote share incumbency advantage by mobile broadband availability and the party in control of the White House, net of controls. The results are based on estimating Equation (3), and the underlying triple-difference regression estimates are reported in Column 2 of Appendix Table A12. The sample consists of elections from 1998 to 2010 featuring both a Democratic and a Republican candidate in districts where the Democratic Party's margin of victory or defeat was less than 20 percentage points in election $t-1$, and where the state did not experience redistricting between elections $t-1$ and t. Controls include year and congressional district fixed effects, linear trends in the Democratic Party's vote margin in the congressional district in election $t-1$ (separately for races that Democrats won and lost), and the direct effects of mobile broadband, separately for years with a Democratic and Republican president. Both panels report 90% confidence intervals with standard errors corrected for clusters at the level of the congressional districts.

Table 1: Disapproval of Incumbents, Knowledge of Candidates' Ideology, and Campaign Contributions

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Disapproval of incumbents	Knowledge of candidate's ideology	Number of individual contributions	Amount of individual contributions	Number of indiv. contributions up to $150	Amount of indiv. contributions up to $150
Model:	OLS	OLS	PPML	PPML	PPML	PPML
Incumbent × ZIP code Mob. Broadband	0.022**	0.018**				
	(0.010)	(0.009)				
Challenger × ZIP code Mob. Broadband		0.024**				
		(0.011)				
Incumbent × District Mob. Broadband			0.055	0.115	0.563	0.817
			(0.404)	(0.217)	(0.858)	(0.645)
Challenger × District Mob. Broadband			0.670*	0.560*	1.392***	1.690***
			(0.346)	(0.320)	(0.504)	(0.497)
Observations	118,131	240,238	2,184	2,184	1,531	1,531
Incumbent: Mean dep. var	0.372	0.548	896.4	454,096	274.6	15,905
Challenger: Mean dep. var		0.388	641.0	302,193	257.3	13,606
P-value: $\gamma[Incumb.] = \gamma[Chal.]$		0.525	0.194	0.200	0.336	0.192
All controls	✓	✓	✓	✓	✓	✓

Note: The table presents the results of estimating the effects of mobile broadband on disapproval of incumbents, knowledge of the candidates' ideology, and campaign contributions. In Columns 1–2, the estimation model is a standard OLS specification. In Columns 3–6, the estimation model is Poisson Pseudo-Maximum Likelihood (PPML), following Correia et al. (2020). In Columns 1–2, the unit of observation is an individual. In Columns 3–6, the unit of observation is a congressional district. Controls include congressional district and year fixed effects, separately for races with Democratic and Republican incumbents and for outcomes related to the incumbent and the challenger, and year-specific linear trends in the Democratic Party's vote margin in congressional district i in period $t-1$, separately for races with Democratic and Republican incumbents and for outcomes related to the incumbent and the challenger. The sample consists of elections featuring both a Democratic and a Republican candidate in districts where the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$, and where the state did not experience redistricting between elections at time $t-1$ and t. In Columns 1–2, the sample consists of elections from 2006 to 2024. In Columns 3–6, the sample consists of elections from 1978 to 2010. Standard errors in parentheses are corrected for clusters at the level of the congressional districts. *** p<0.01, ** p<0.05, * p<0.1.

Supplementary Appendix

A.I Data

Mobile broadband coverage.—Collins Bartholomew's coverage maps are based on data submitted to the GSM Association by mobile operators that use the GSM (Global System for Mobile Communications) standard. In the United States, the primary GSM providers during the study period were AT&T and T-Mobile, which accounted for up to 40% and 16% of wireless subscriptions, respectively, between 2008 and 2019 (Statista, 2023). Both companies submitted coverage data to the GSM Association. AT&T played a particularly significant role in the early years of mobile broadband due to its exclusivity agreement with Apple, which made it the sole U.S. provider of iPhone service from the device's launch in 2007 until 2011. Because the iPhone was central in transforming how individuals accessed and used mobile internet, and given that our identifying variation is based on the 2008 and 2010 congressional elections, the availability of AT&T coverage is especially important for our analysis.[15]

The Mobile Coverage Explorer dataset does not include two major U.S. mobile operators, Verizon and Sprint, that used the CDMA communication standard during this period. At the time, CDMA-compatible phones were designed in a way that user identification (e.g., phone number) with the carrier was conducted through the phone's hardware. As a result, CDMA users were tied to the device that they initially purchased because the carrier signal could not be separated from the device. Due to this feature, Verizon and Sprint users were much less affected by the initial phases of the "smartphone revolution" kicked off by the introduction of the iPhone in 2007: early CDMA-compatible devices (HTC, Blackberry, Motorola Droid, and other early Android devices) were much less suitable for social media use, internet browsing, and sharing images and videos than the iPhone. Both Verizon and Sprint eventually became compatible with modern smartphones, but this happened much later. For instance, the first CDMA-compatible iPhone was introduced only in 2011, after the period when all of the U.S. congressional districts had at least some areas covered with GSM 3G. In earlier years, however, AT&T's exclusivity agreement with Apple makes it plausible that GSM networks played a particularly important role in increasing smartphone adoption and transforming internet use.[16]

[15] As shown in Figure A2, no congressional district had access to mobile broadband in 2006, whereas all congressional districts did by 2012.

[16] Coverage data for Verizon and Sprint are available through the Federal Communications Commission (FCC), beginning in late 2010 (reflecting treatment status in 2011), when all the congressional districts already had access

Campaign Contributions.—In the Database on Ideology, Money in Politics, and Elections (DIME) (Bonica, 2024), we restrict attention to contributions not exceeding the maximum legally permitted individual limits and calculate, for each candidate, both the number of contributions received and their total value.[17] In addition, we separately compute the number and total value of small contributions, defined as those not exceeding $150.

Unemployment.—To examine heterogeneity in the effects of mobile broadband across the congressional districts, we classify districts according to whether they experienced above- or below-median increases in the unemployment rate between 2007 and 2010. We use county-level labor market data from the U.S. Bureau of Labor Statistics, matching counties to congressional districts based on their centroids. For each district, we then calculate the unemployment rate in 2007 and in 2010, and divide districts into two groups depending on whether the increase was above or below the median of 4.62 percentage points.

Housing prices.—We also examine the heterogeneity in the effects of mobile broadband across the congressional districts that were differentially affected by the collapse of the U.S. housing bubble in 2008. We use data from Zillow's Home Value Index (ZHVI) to calculate changes in typical home values between 2007 and 2010 across congressional districts. The ZHVI is a seasonally adjusted measure reflecting the typical home value in a given area, calculated from the values of homes in the 35th to 65th percentile of the local housing market. The index is constructed as a weighted average of model-based home value estimates for more than 100 million U.S. residential properties, regardless of recent sales activity.

For each congressional district, we calculate the change in ZHVI between 2007—the year preceding the collapse of the U.S. housing market—and 2010, when housing prices in the United States reached a local minimum. We then divide the sample into two groups: districts that experienced a decline in average home values greater than $30,800—the median decline across all districts—and those with smaller decreases.

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to mobile broadband. In a related study, Melnikov (2025) utilizes both the Mobile Coverage Explorer and FCC data at the ZIP-code level—many of which remained untreated in 2011—to compare the post-2010 effects of the two types of mobile operators on political polarization in the United States. The estimates derived from the two data sources are highly consistent. Thus, although the absence of post-2010 variation in the congressional districts' treatment status prevents us from conducting a comparable analysis, there is no evidence to suggest that GSM and CDMA operators differentially affected voters after 2010.

[17]The maximum permitted individual contribution limits were as follows: $1,000 before 2004, $2,000 in 2004, $2,100 in 2006, $2,300 in 2008, and $2,400 in 2010.

A.II Party-specific incumbency advantage

The canonical regression discontinuity design framework developed by Lee (2008) does not allow for calculating a party-specific measure of incumbency advantage in a two-party system. To illustrate this point, consider the following notation. Let V_p^{0+} and V_p^{0-} denote the expected vote shares of the congressional candidate from party $p \in \{d, r\}$ in election t, conditional on the party narrowly winning or losing the election in the previous period, respectively. Lee's canonical regression discontinuity estimator calculates incumbency advantage using the Democratic Party's vote share as follows:

$$IA_d^L = V_d^{0+} - V_d^{0-}.$$

In a two-party system, where $V_d^{0+} = 1 - V_r^{0-}$ and $V_d^{0-} = 1 - V_r^{0+}$, an analogous regression discontinuity measure using the Republican party's vote share yields an identical result:

$$IA_r^L = V_r^{0+} - V_r^{0-} = [1 - V_d^{0-}] - [1 - V_d^{0+}] = V_d^{0+} - V_d^{0-} = IA_d^L.$$

To address this limitation, we propose the following simple party-specific measure of incumbency advantage:

$$\widetilde{IA}_p = V_p^{0+} - V_{p'}^{0-} = 2V_p^{0+} - 1$$

where p' represents the party other than p. In other words, this measure of incumbency advantage represents the expected vote margin of party p conditional on it narrowly winning the previous election. In the absence of incumbency advantage, a congressional candidate who narrowly won election $t-1$ (by margin $\varepsilon \to 0$) would be expected to receive a vote margin of 0 in election t. Therefore, $\widetilde{IA}_i$ captures the average electoral advantage incumbent candidates from party p enjoy in subsequent elections.

The advantage of $\widetilde{IA}_p$ is that, in a two-party system, its sum across the two parties corresponds to incumbency advantage measured for the same outcome variable (i.e., vote margin) using the regression discontinuity design of Lee (2008):

$$\widetilde{IA}_d + \widetilde{IA}_r = 2V_d^{0+} - 1 + 2V_r^{0+} - 1 = 2V_d^{0+} - 2V_d^{0-} = 2IA_d^L = 2IA_r^L.$$

The relation of $\widetilde{IA}_p$ to the RDD-based vote *share* incumbency advantage is also straightforward: $IA_p^L = (\widetilde{IA}_d + \widetilde{IA}_r)/2$.

Appendix Figures

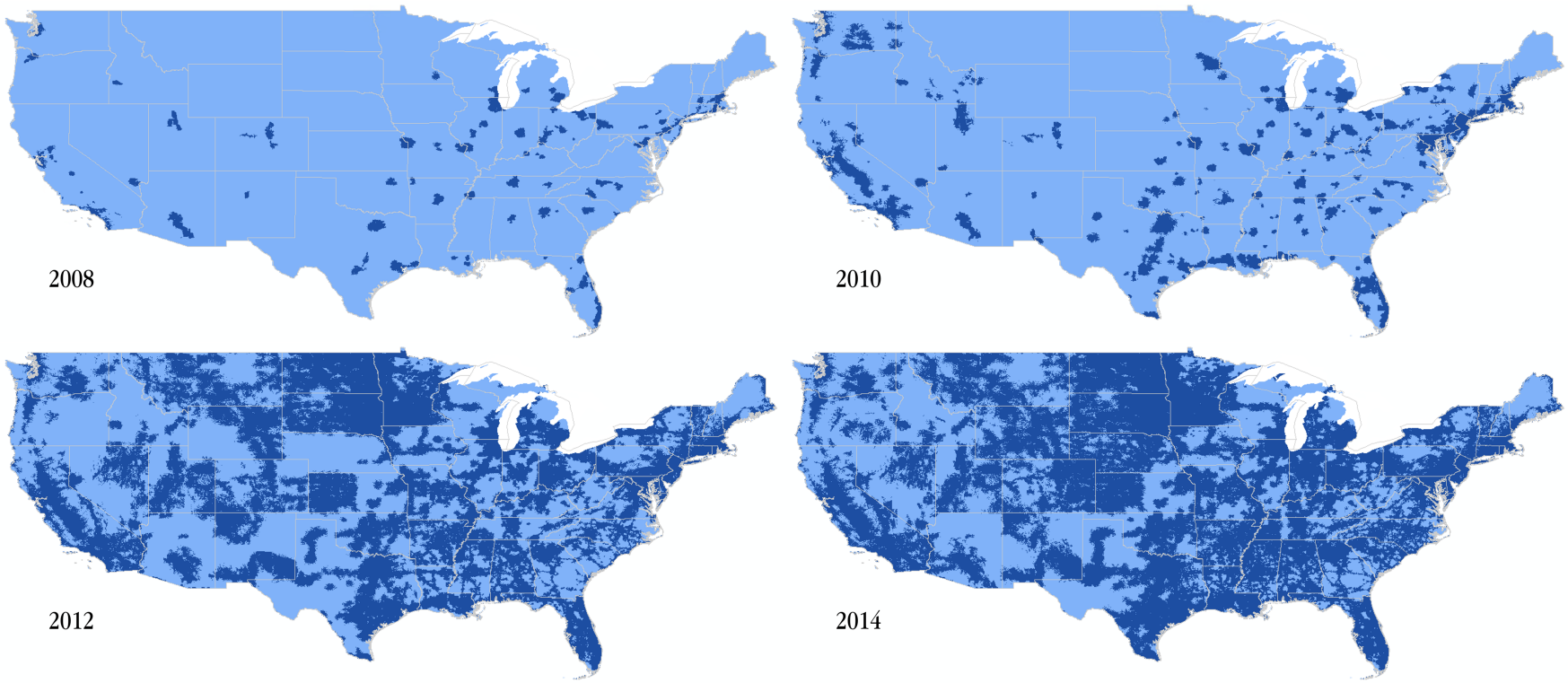

Figure A1: Expansion of Mobile Broadband Between 2008 and 2014

Note: The maps depict mobile broadband network coverage in the contiguous United States for two-year periods between 2008 and 2014. All the maps present mobile broadband network coverage at the beginning of that year. The data consist of 1×1-kilometer binary grid cells.

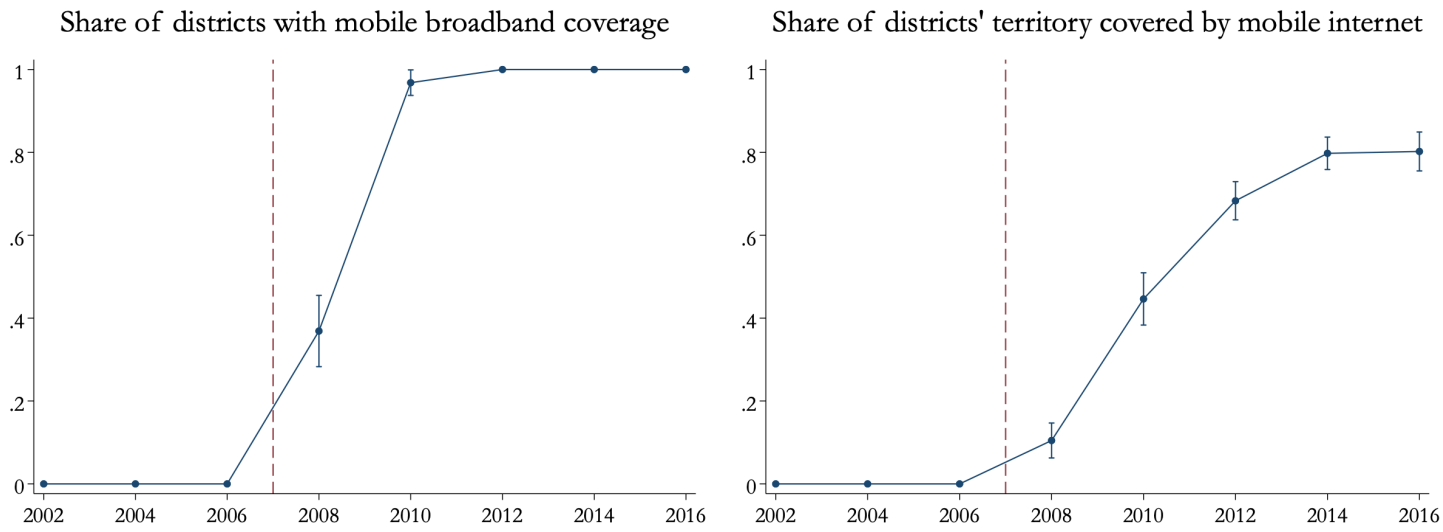

Figure A2: Mobile Broadband Coverage Over Time

Note: The figure presents the evolution of the share of congressional districts with access to mobile broadband and the share of their territory covered over time. The standard errors are corrected for clusters at the level of the congressional districts.

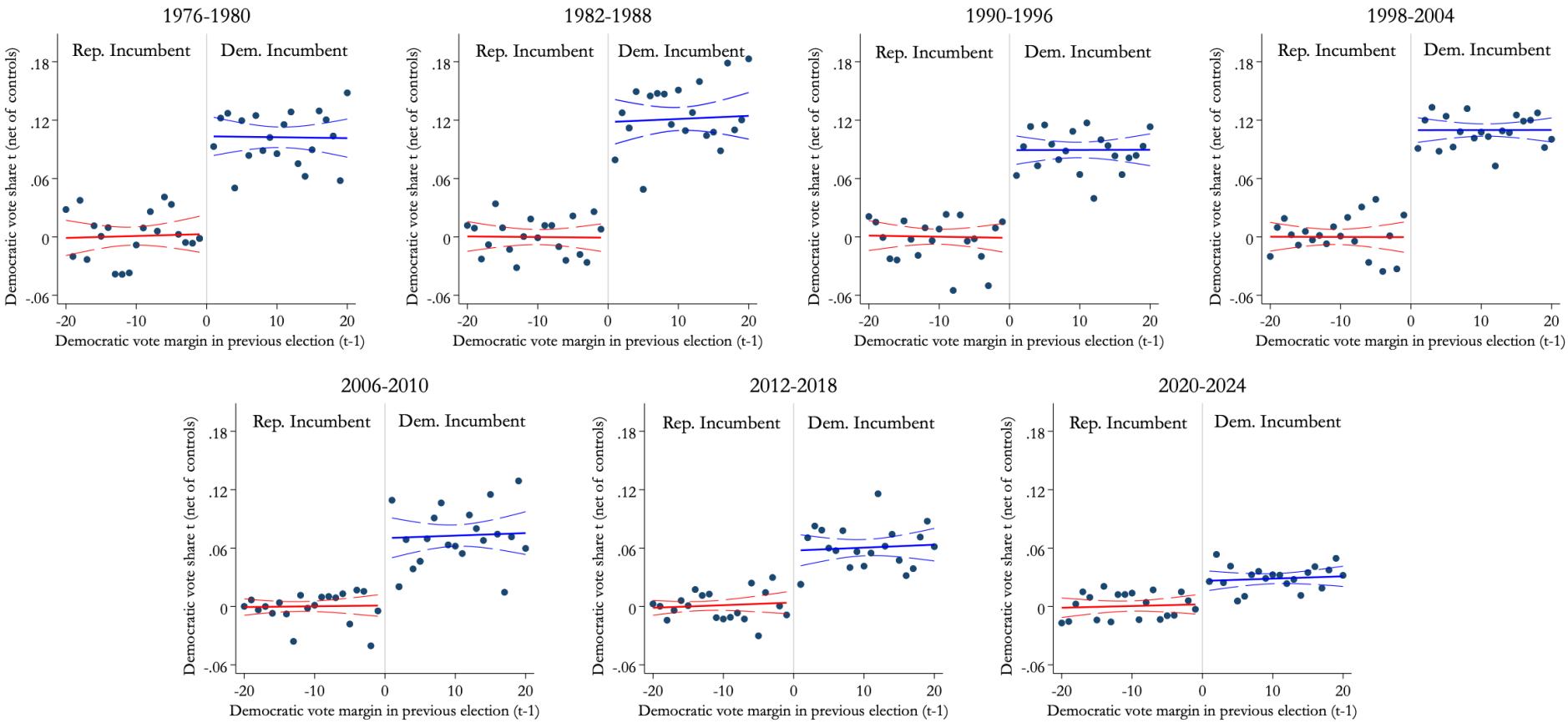

Figure A3: Regression Discontinuity Estimates of Incumbency Advantage, Net of All Controls

Note: The figure presents period-by-period regression discontinuity plots for vote share incumbency advantage, net of all controls. Controls include year and congressional district fixed effects and linear trends in the Democratic Party's vote margin in the congressional district in period $t-1$, separately for races that Democrats won and lost and for each period. The vertical axis represents the average residual of the Democratic vote share; the horizontal axis—the Democratic vote margin in the previous election. The sample consists of elections featuring both a Democratic and a Republican candidate in districts where the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$, and where the state did not experience redistricting between elections at time $t-1$ and time t. The figure presents 90% confidence intervals.

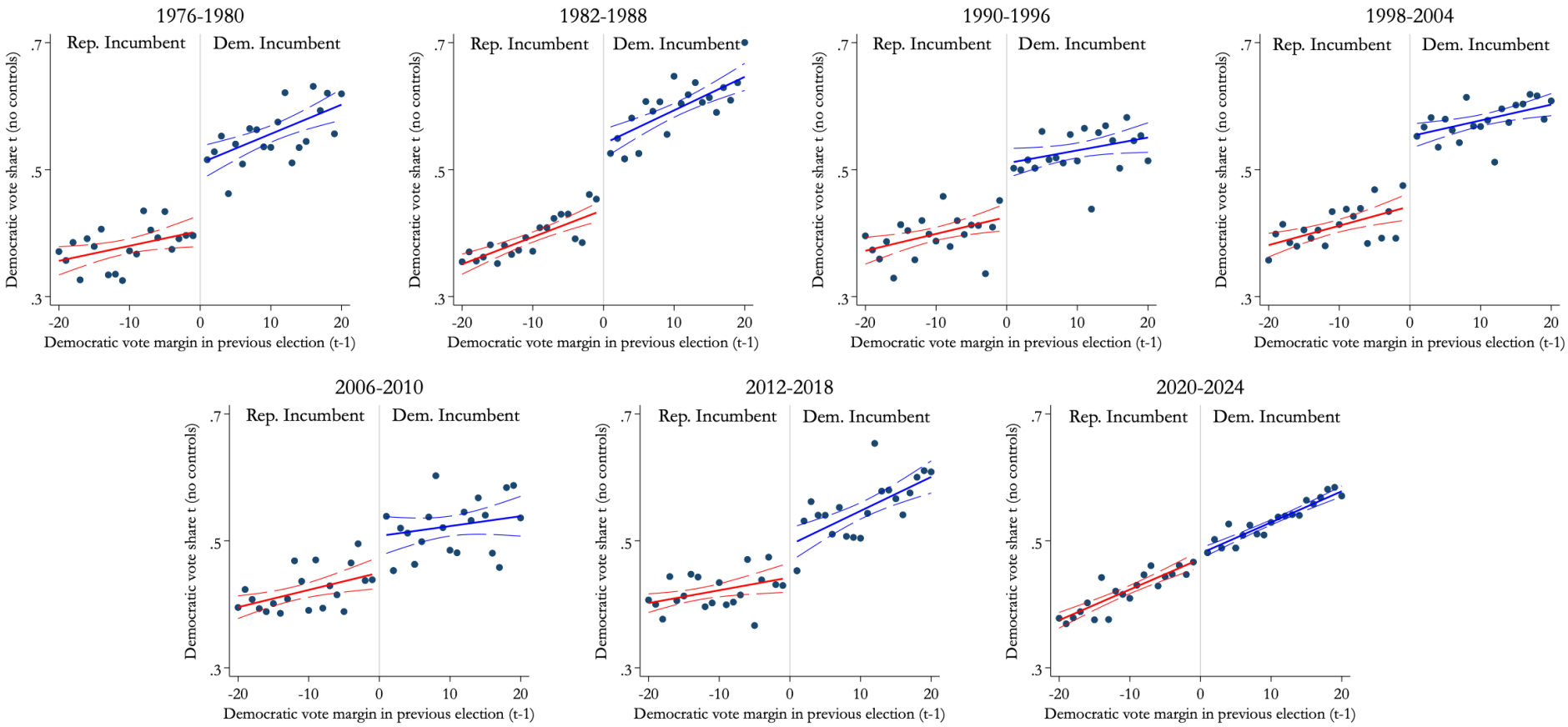

Figure A4: Regression Discontinuity Estimates of Incumbency Advantage, No Additional Controls

Note: The figure presents period-by-period regression discontinuity plots for vote share incumbency advantage with no controls included. The vertical axis represents the average residual of the Democratic vote share; the horizontal axis—the Democratic vote margin in the previous election. Each dot corresponds to the mean Democratic vote share, by one-percentage-point bins. The sample consists of elections featuring both a Democratic and a Republican candidate in districts where the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$, and where the state did not experience redistricting between elections at time $t-1$ and time t. The figure presents 90% confidence intervals.

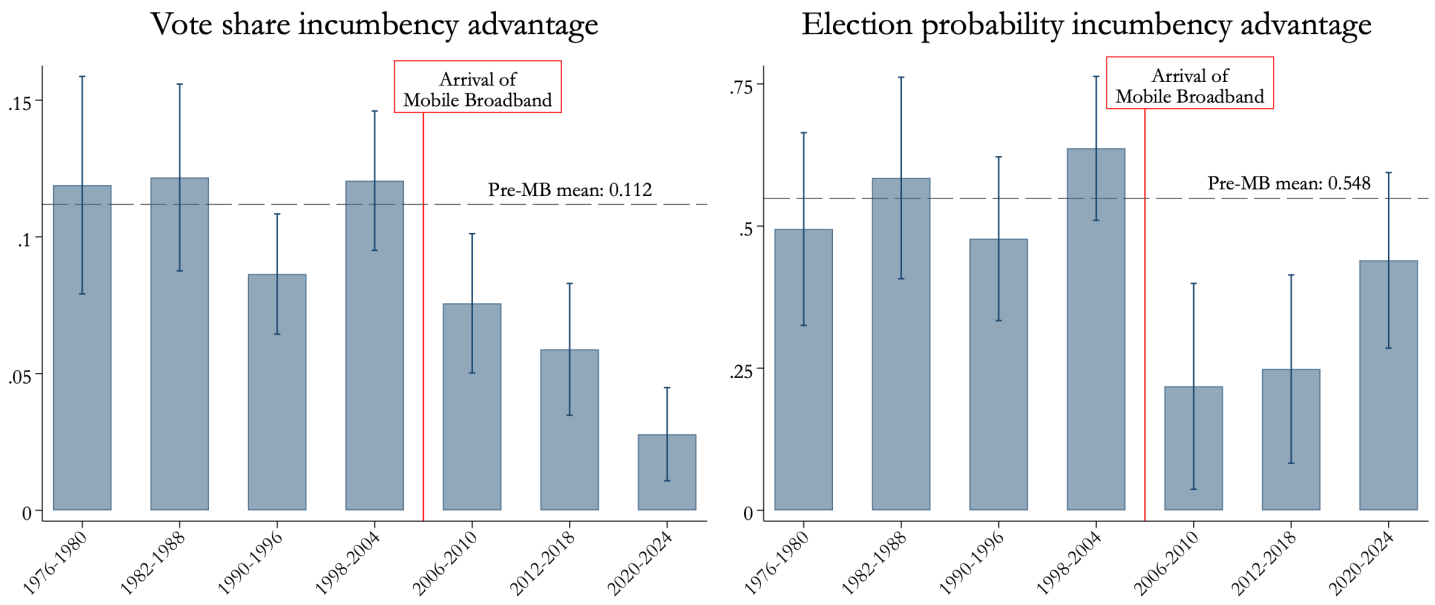

Figure A5: Candidate-Level Incumbency Advantage Over Time

Note: MB = Mobile Broadband. The figure presents the results of estimating Equation (1) for different time periods, focusing only on races where the incumbent is running for reelection. Corresponding regression estimates are presented in Columns 4 and 8 of Appendix Table A5. The sample consists of elections featuring both a Democratic and a Republican candidate in districts where the incumbent is running for reelection, where the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$, and where the state did not experience redistricting between elections at time $t-1$ and time t. Controls include year and congressional district fixed effects and linear trends in the Democratic Party's vote margin in the congressional district in period $t-1$, separately for races that Democrats won and lost and for each time period. The standard errors are corrected for clusters at the level of the congressional districts.

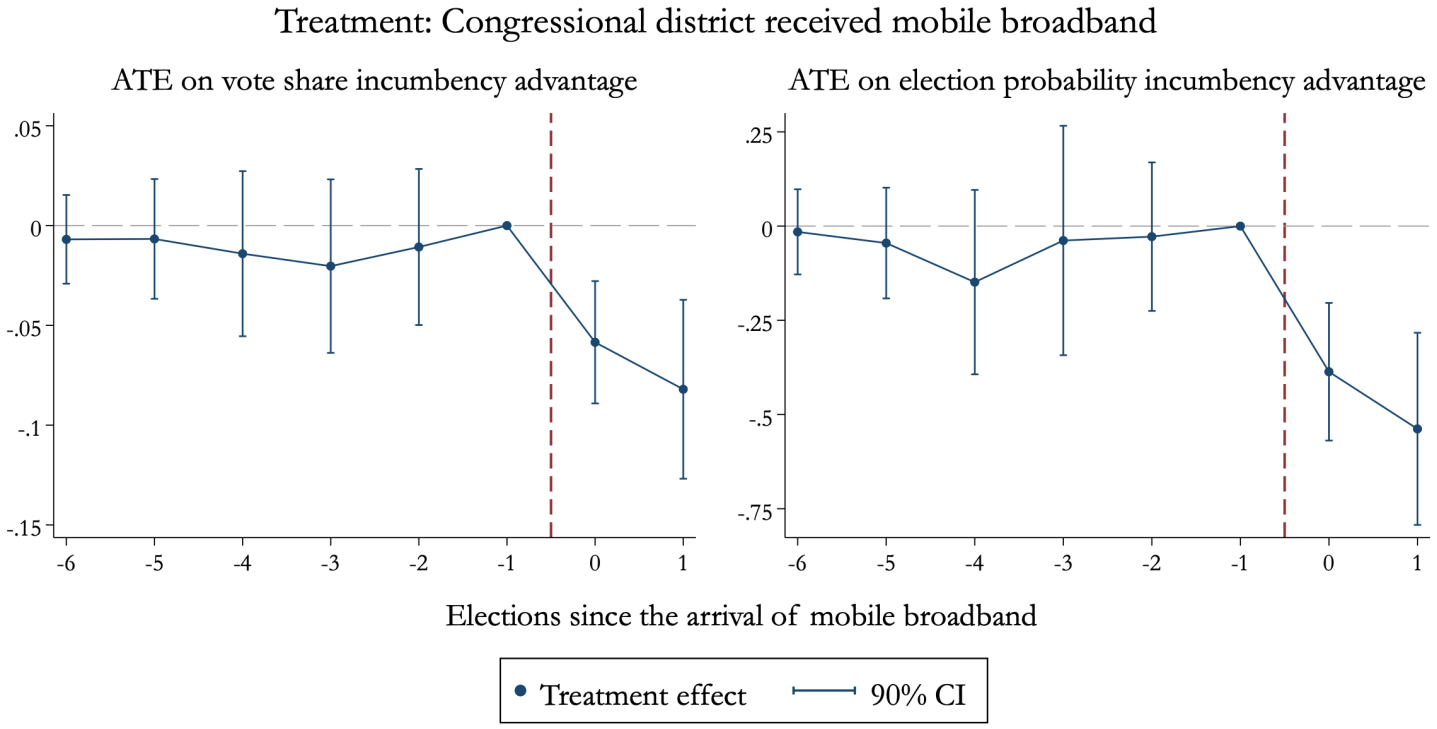

Figure A6: Mobile Broadband and Candidate-Level Incumbency Advantage

Note: The figure presents the results of estimating Equation (2) for the incumbency advantage in vote share (left) and election probability (right) using the Sun and Abraham (2021) estimator, focusing only on races where the incumbent is running for reelection. Corresponding regression estimates are presented in Columns 4 and 8 of Appendix Table A6. The sample consists of elections prior to 2012 featuring both a Democratic and a Republican candidate in districts where the incumbent is running for reelection, where the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$, and where the state did not experience redistricting between elections at time $t-1$ and time t. Controls include year and congressional district fixed effects, linear trends in the Democratic Party's vote margin in the congressional district in period $t-1$ (separately for races that Democrats won and lost), *Election win in period* $t-1$, and the lags and leads of the treatment variable. The standard errors are corrected for clusters at the level of the congressional districts.

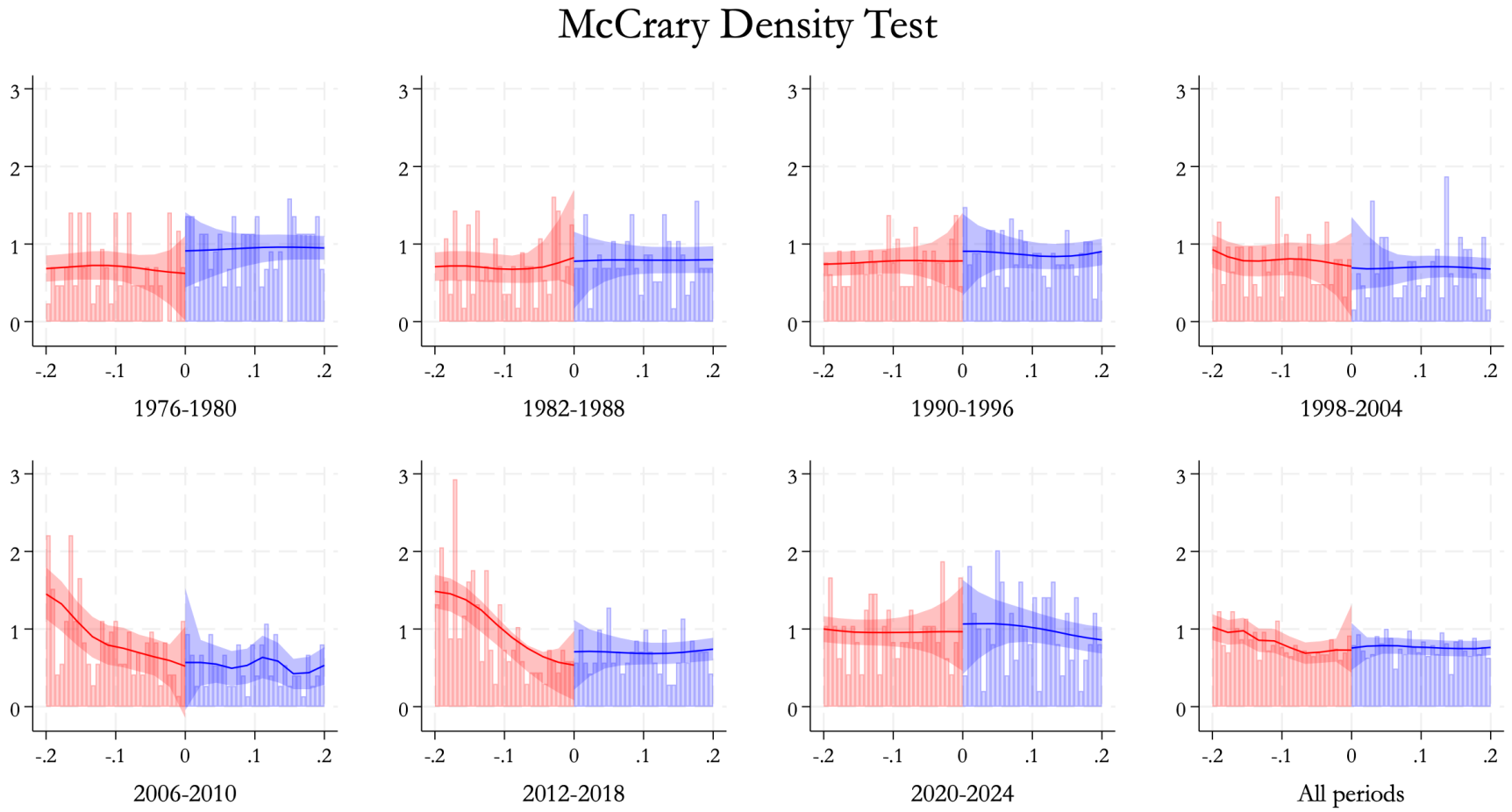

Figure A7: McCrary Density Test

Note: The figure presents the period-by-period results of the density test proposed by McCrary (2008) for the RD running variable: the Democratic vote margin in $t-1$. For each period, the sample consists of elections featuring both a Democratic and a Republican candidate in districts where the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$, and where the state did not experience redistricting between elections at time $t-1$ and time t.

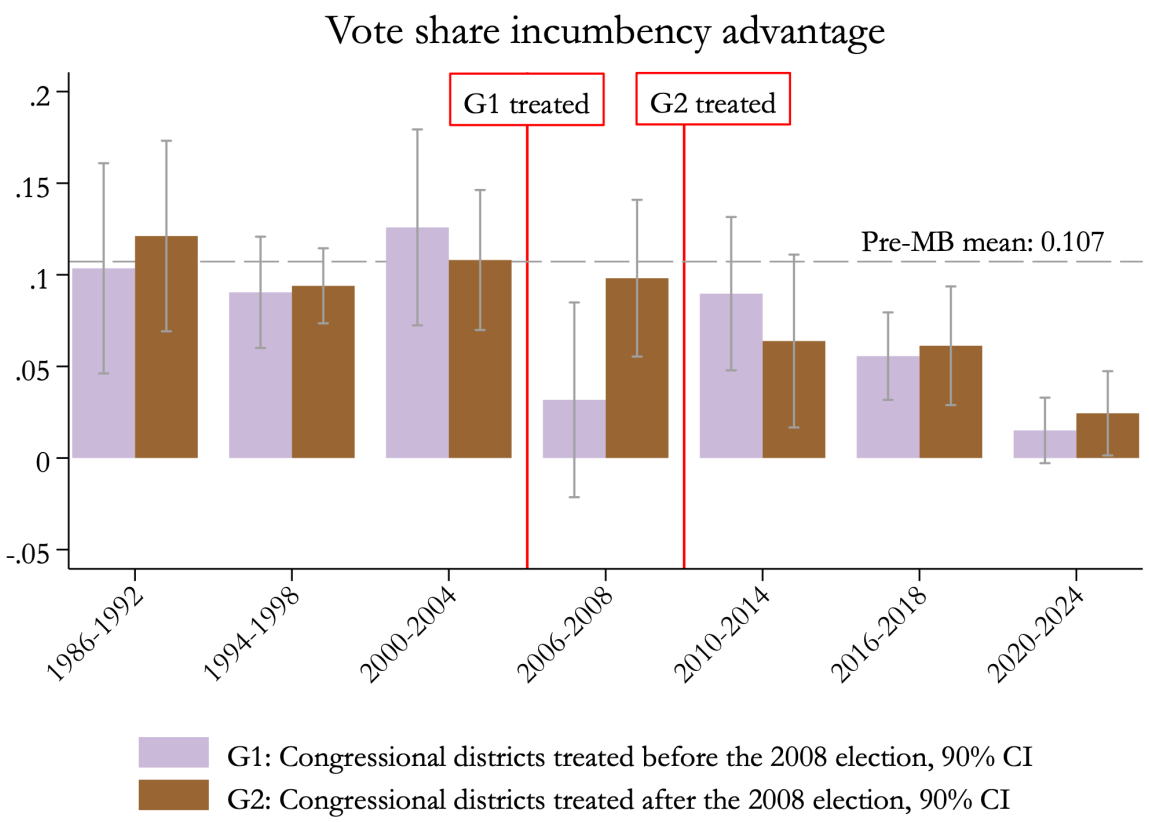

Figure A8: Incumbency Advantage Over Time, by Treatment Cohort

Note: MB = Mobile Broadband. The figure presents the results of estimating Equation (1), separately for the cohort of congressional districts treated before and after the 2008 elections. Controls include year and congressional district fixed effects and linear trends in the Democratic Party's vote margin in the congressional district in period $t-1$, separately for races that Democrats won and lost, each year, and each treatment cohort (i.e., G1 and G2). The sample consists of elections featuring both a Democratic and a Republican candidate in districts where the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$, and where the state did not experience redistricting between elections at time $t-1$ and time t. The standard errors are corrected for clusters at the level of the congressional districts.

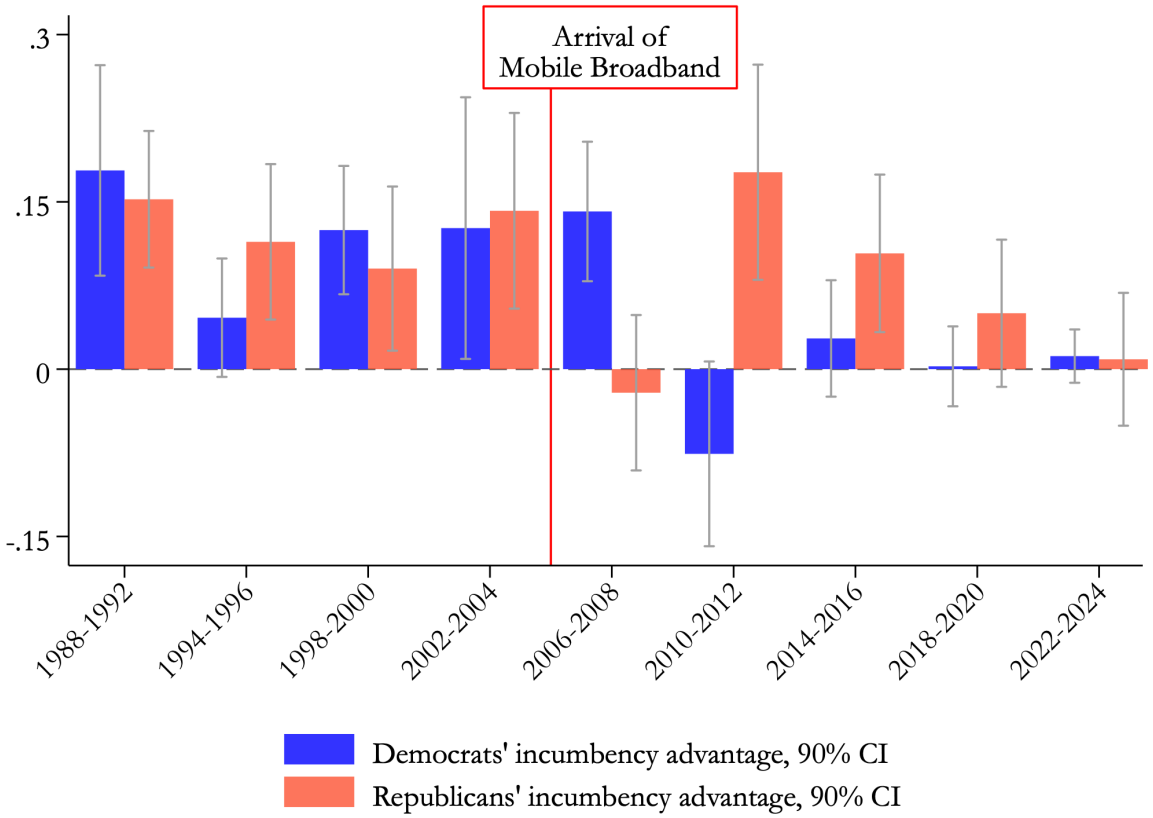

Figure A9: Incumbency Advantage Over Time, by Party

Note: The figure presents the heterogeneity analysis of the evolution of incumbency advantage (Figure 1) by party. The analysis is conducted separately for Democratic and Republican candidates. Controls include period-specific linear trends in the vote margin for the respective outcome variable in congressional district i in period $t-1$ (separately for races that Democrats won and lost). The sample consists of elections featuring both a Democratic and a Republican candidate in districts where the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$, and where the state did not experience redistricting between elections at time $t-1$ and time t. The standard errors are corrected for clusters at the level of the congressional districts.

Appendix Tables

Table A1: Summary Statistics

Variable	Mean	St. Dev.	Observations	Source
Democratic vote share t	0.480	0.110	2,786	MIT Election Data
Democratic vote margin t	-0.014	0.215	2,786	MIT Election Data
Democratic winner t	0.473	0.499	2,786	MIT Election Data
Democratic incumbent t	0.483	0.500	2,786	MIT Election Data
Democratic vote margin $t-1$	-0.005	0.118	2,786	MIT Election Data
Incumbent running t	0.903	0.296	2,786	MIT Election Data
District has mob. broadband t:				
All years	0.407	0.491	2,786	Mobile Coverage Explorer
Before 2012	0.090	0.286	1,816	Mobile Coverage Explorer
District mob. broadband coverage t:				
All years	0.304	0.413	2,786	Mobile Coverage Explorer
Before 2012	0.036	0.156	1,816	Mobile Coverage Explorer
County mob. broadband coverage t	0.316	0.414	45,716	Mobile Coverage Explorer
ZIP code mob. broadband coverage t	0.817	0.361	323,673	Mobile Coverage Explorer
County-level incumbent vote share t	0.627	0.144	45,716	Dave Leip's Election Atlas
County-level challenger vote share t	0.352	0.142	45,716	Dave Leip's Election Atlas
Respondent voted for the incumbent	0.611	0.487	323,673	CES
Respondent voted for the challenger	0.382	0.486	323,673	CES
Disapproval of incumbents	0.372	0.483	118,131	CES
Knowledge of incumbent's ideology	0.548	0.498	120,119	CES
Knowledge of challenger's ideology	0.388	0.487	120,119	CES
Number of individual contributions:				
All contributions to incumbents	896.4	2004.4	1,093	DIME
All contributions to challengers	639.9	1219.3	1,093	DIME
Contributions below \$150 to incumbents	274.6	1761.9	821	DIME
Contributions below \$150 to challengers	222.4	802.0	821	DIME
Amount of individual contributions:				
All contributions to incumbents	454,096	627,419	1,093	DIME
All contributions to challengers	301,640	494,125	1,093	DIME
Contributions below \$150 to incumbents	15,905	77,012	821	DIME
Contributions below \$150 to challengers	11,767	34,682	821	DIME

Table A2: Time-Specific Optimal Bandwidths

	(1)	(2)
Dep. Var.:	Vote share	Election win probability
Time period t:		
$1974 < t \leq 1980$	0.187	0.232
$1980 < t \leq 1988$	0.189	0.222
$1988 < t \leq 1996$	0.208	0.275
$1996 < t \leq 2004$	0.192	0.312
$2004 < t \leq 2010$	0.214	0.245
$2010 < t \leq 2018$	0.194	0.198
$2018 < t \leq 2024$	0.234	0.146

Note: The table reports the period-specific optimal bandwidths estimated using the procedure suggested by Calonico et al. (2014) and Calonico et al. (2020). For each period, the sample consists of elections featuring both a Democratic and a Republican candidate in states that did not experience redistricting between elections at time $t-1$ and time t.

Table A3: Incumbency Advantage Over Time

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. Var.:	Vote share in election t				Win probability in election t			
Election win in $t-1$ ×								
$1974 < t \leq 1980$	0.107***	0.107***	0.100***	0.102***	0.493***	0.493***	0.439***	0.431***
	(0.024)	(0.024)	(0.024)	(0.024)	(0.096)	(0.096)	(0.106)	(0.106)
$1980 < t \leq 1988$	0.118***	0.122***	0.121***	0.123***	0.551***	0.619***	0.517***	0.581***
	(0.015)	(0.018)	(0.016)	(0.020)	(0.069)	(0.086)	(0.077)	(0.105)
$1988 < t \leq 1996$	0.099***	0.094***	0.090***	0.090***	0.519***	0.517***	0.460***	0.499***
	(0.012)	(0.012)	(0.012)	(0.013)	(0.071)	(0.082)	(0.072)	(0.086)
$1996 < t \leq 2004$	0.114***	0.112***	0.105***	0.110***	0.727***	0.728***	0.598***	0.574***
	(0.018)	(0.016)	(0.017)	(0.016)	(0.063)	(0.078)	(0.066)	(0.081)
$2004 < t \leq 2010$	0.068***	0.071***	0.073***	0.074***	0.244***	0.234**	0.235**	0.210**
	(0.015)	(0.015)	(0.014)	(0.015)	(0.092)	(0.094)	(0.101)	(0.105)
$2010 < t \leq 2018$	0.057***	0.064***	0.047***	0.062***	0.285***	0.355***	0.195**	0.263***
	(0.016)	(0.015)	(0.017)	(0.014)	(0.081)	(0.091)	(0.082)	(0.096)
$2018 < t \leq 2024$	0.036***	0.024***	0.031***	0.030***	0.439***	0.499***	0.319***	0.450***
	(0.009)	(0.008)	(0.011)	(0.010)	(0.076)	(0.084)	(0.079)	(0.092)
Observations	2,786	2,043	2,752	1,991	2,786	2,043	2,752	1,991
Mean dep. var	0.480	0.477	0.479	0.476	0.473	0.461	0.472	0.459
Excluding redistricted districts		✓		✓		✓		✓
Congressional district FEs			✓	✓			✓	✓
Baseline controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: This table presents the results of estimating Equation (1) for different time periods. The unit of observation is a congressional district. In Columns 1–4, the outcome variable is the Democratic Party's vote share in congressional district i in period t. In Columns 5–8, the outcome variable is a dummy for whether the Democratic Party won the election in congressional district i in period t. Baseline controls include year fixed effects and linear trends in the Democratic Party's vote margin in congressional district i in period $t-1$, separately for races that Democrats won and lost and for each time period. In Columns 3–4 and 7–8, controls also include congressional district fixed effects. The sample consists of elections featuring both a Democratic and a Republican candidate in districts where the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$. In the even-numbered columns, the sample includes only states that did not experience redistricting between elections at time $t-1$ and time t. Standard errors in parentheses are corrected for clusters at the level of the congressional districts. *** p<0.01, ** p<0.05, * p<0.1.

Table A4: Mobile Broadband and Incumbency Advantage

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. Var.:	Vote share in election t				Win probability in election t			
Election win in $t-1$ ×								
× District has MB	-0.070***	-0.060***			-0.384***	-0.456***		
	(0.010)	(0.012)			(0.059)	(0.067)		
× District got MB after $t+5$			-0.007	-0.013			-0.020	-0.050
			(0.010)	(0.011)			(0.042)	(0.055)
× District got MB in $t+5$			-0.002	-0.008			0.084	-0.060
			(0.014)	(0.015)			(0.064)	(0.077)
× District got MB in $t+4$			-0.017	-0.017			-0.011	-0.214
			(0.024)	(0.023)			(0.118)	(0.134)
× District got MB in $t+3$			-0.033	-0.007			0.022	0.042
			(0.023)	(0.022)			(0.148)	(0.161)
× District got MB in $t+2$			-0.007	-0.000			-0.007	-0.024
			(0.019)	(0.020)			(0.089)	(0.100)
× District got MB in t			-0.073***	-0.062***			-0.411***	-0.456***
			(0.014)	(0.015)			(0.078)	(0.089)
× District got MB in $t-1$			-0.080***	-0.081***			-0.367***	-0.583***
			(0.016)	(0.022)			(0.111)	(0.126)
Observations	1,404	1,342	1,404	1,342	1,404	1,342	1,404	1,342
Mean dep. var	0.478	0.478	0.478	0.478	0.463	0.461	0.463	0.461
Excluding redistricted districts	✓	✓	✓	✓	✓	✓	✓	✓
Congressional district FEs		✓		✓		✓		✓
Baseline controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: MB = Mobile Broadband. This table presents the results of estimating Equation (2). The unit of observation is a congressional district. In Columns 1–4, the outcome variable is the Democratic Party's vote share in congressional district i in period t. In Columns 5–8, the outcome variable is a dummy for whether the Democratic Party won the election in congressional district i in period t. Baseline controls include year fixed effects, linear trends in the Democratic Party's vote margin in congressional district i in period $t-1$ (separately for races that Democrats won and lost), *Election win in period* $t-1$, and the variables interacted with *Election win in period* $t-1$. In the even-numbered columns, controls also include congressional district fixed effects. The sample consists of elections prior to 2012 featuring both a Democratic and a Republican candidate in districts where the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$ in states that did not experience redistricting between elections at time $t-1$ and time t. Standard errors in parentheses are corrected for clusters at the level of the congressional districts. *** p<0.01, ** p<0.05, * p<0.1.

Table A5: Incumbency Advantage Over Time, Incumbent Running for Reelection

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. Var.:	Vote share in election t				Win probability in election t			
Election win in $t-1$ ×								
$1974 < t \leq 1980$	0.119***	0.119***	0.110***	0.119***	0.545***	0.545***	0.467***	0.495***
	(0.024)	(0.024)	(0.024)	(0.024)	(0.091)	(0.091)	(0.100)	(0.103)
$1980 < t \leq 1988$	0.128***	0.126***	0.126***	0.122***	0.590***	0.651***	0.539***	0.585***
	(0.015)	(0.018)	(0.017)	(0.021)	(0.067)	(0.085)	(0.079)	(0.108)
$1988 < t \leq 1996$	0.103***	0.095***	0.096***	0.086***	0.540***	0.534***	0.464***	0.478***
	(0.012)	(0.012)	(0.012)	(0.013)	(0.074)	(0.084)	(0.077)	(0.088)
$1996 < t \leq 2004$	0.127***	0.117***	0.121***	0.121***	0.764***	0.753***	0.660***	0.637***
	(0.017)	(0.016)	(0.017)	(0.015)	(0.060)	(0.072)	(0.065)	(0.077)
$2004 < t \leq 2010$	0.068***	0.071***	0.070***	0.076***	0.242**	0.231**	0.226**	0.218**
	(0.015)	(0.015)	(0.015)	(0.015)	(0.096)	(0.097)	(0.104)	(0.110)
$2010 < t \leq 2018$	0.067***	0.067***	0.059***	0.059***	0.321***	0.366***	0.237***	0.248**
	(0.016)	(0.015)	(0.016)	(0.015)	(0.079)	(0.096)	(0.083)	(0.101)
$2018 < t \leq 2024$	0.035***	0.026***	0.028***	0.028***	0.431***	0.501***	0.311***	0.440***
	(0.009)	(0.008)	(0.010)	(0.010)	(0.077)	(0.085)	(0.080)	(0.094)
Observations	2,515	1,877	2,480	1,824	2,515	1,877	2,480	1,824
Mean dep. var	0.479	0.477	0.479	0.477	0.474	0.466	0.473	0.465
Excluding redistricted districts		✓		✓		✓		✓
Congressional district FEs			✓	✓			✓	✓
Baseline controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: This table presents the results of estimating Equation (1) for different time periods, focusing only on races where the incumbent is running for reelection. The unit of observation is a congressional district. In Columns 1–4, the outcome variable is the Democratic Party's vote share in congressional district i in period t. In Columns 5–8, the outcome variable is a dummy for whether the Democratic Party won the election in congressional district i in period t. Baseline controls include year fixed effects and linear trends in the Democratic Party's vote margin in congressional district i in period $t-1$, separately for races that Democrats won and lost and each time period. In Columns 3–4 and 7–8, controls also include congressional district fixed effects. The sample consists of elections featuring both a Democratic and a Republican candidate in districts where the incumbent is running for reelection, and the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$. In the even-numbered columns, the sample includes only states that did not experience redistricting between elections at time $t-1$ and time t. Standard errors in parentheses are corrected for clusters at the level of the congressional districts. *** p<0.01, ** p<0.05, * p<0.1.

Table A6: Mobile Broadband and Incumbency Advantage, Incumbent Running for Reelection

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. Var.:	Vote share in election t				Win probability in election t			
Election win in $t-1$ ×								
× District has MB	-0.072***	-0.061***			-0.376***	-0.414***		
	(0.010)	(0.013)			(0.060)	(0.071)		
× District got MB after $t+5$			-0.001	-0.007			0.007	-0.015
			(0.010)	(0.011)			(0.043)	(0.058)
× District got MB in $t+5$			-0.003	-0.007			0.097*	-0.045
			(0.014)	(0.015)			(0.059)	(0.075)
× District got MB in $t+4$			-0.008	-0.014			0.060	-0.149
			(0.022)	(0.021)			(0.104)	(0.125)
× District got MB in $t+3$			-0.039*	-0.020			-0.010	-0.038
			(0.023)	(0.022)			(0.147)	(0.155)
× District got MB in $t+2$			-0.007	-0.011			0.023	-0.028
			(0.019)	(0.020)			(0.086)	(0.101)
× District got MB in t			-0.069***	-0.058***			-0.371***	-0.386***
			(0.014)	(0.016)			(0.081)	(0.093)
× District got MB in $t-1$			-0.086***	-0.082***			-0.380***	-0.538***
			(0.016)	(0.023)			(0.115)	(0.130)
Observations	1,301	1,235	1,301	1,235	1,301	1,235	1,301	1,235
Mean dep. var	0.479	0.479	0.479	0.479	0.467	0.466	0.467	0.466
Excluding redistricted districts	✓	✓	✓	✓	✓	✓	✓	✓
Congressional district FEs		✓		✓		✓		✓
Baseline controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: MB = Mobile Broadband. This table presents the results of estimating Equation (2), focusing only on races where the incumbent is running for reelection. The unit of observation is a congressional district. In Columns 1–4, the outcome variable is the Democratic Party's vote share in congressional district i in period t. In Columns 5–8, the outcome variable is a dummy for whether the Democratic Party won the election in congressional district i in period t. Baseline controls include year fixed effects, linear trends in the Democratic Party's vote margin in congressional district i in period $t-1$ (separately for races that Democrats won and lost), *Election win in period* $t-1$, and the variables interacted with *Election win in period* $t-1$. In the even-numbered columns, controls also include congressional district fixed effects. The sample consists of elections prior to 2012 featuring both a Democratic and a Republican candidate in districts where the incumbent is running for reelection, and the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$ in states that did not experience redistricting between elections at time $t-1$ and time t. Standard errors in parentheses are corrected for clusters at the level of the congressional districts. *** p<0.01, ** p<0.05, * p<0.1.

Table A7: Congressional district-year Fixed Effects

Panel A: Incumbents	(1)	(2)	(3)	(4)
	Incumbent's vote share (county level)		Share of respondents voting for the incumbent	
MB coverage in the county	-0.027***	-0.034***		
	(0.008)	(0.008)		
MB coverage in the ZIP code			-0.023***	-0.021**
			(0.009)	(0.010)
Observations	45,716	44,645	323,673	323,673
Mean dep. var	0.627	0.627	0.611	0.611
Panel B: Challengers	(5)	(6)	(7)	(8)
	Challenger's vote share (county level)		Share of respondents voting for the challenger	
MB coverage in the county	0.023***	0.033***		
	(0.008)	(0.008)		
MB coverage in the ZIP code			0.024***	0.023**
			(0.008)	(0.010)
Observations	45,716	44,645	323,673	323,673
Mean dep. var	0.352	0.352	0.382	0.382
Baseline FEs	✓		✓	
District-year FEs		✓		✓

Note: MB = Mobile Broadband. This table presents the results of estimating the effects of mobile broadband on county-level voting outcomes and survey-based self-reported voting. In Columns 1 and 2, the unit of observation is a county; in Columns 3 and 4—an individual. In Columns 1 and 2, the outcome variable is the incumbent party's vote share in county j in period t. In Columns 3 and 4, the outcome variable is a dummy for whether the respondent voted for the incumbent party in period t. Columns 1 and 3 include year and congressional district × incumbent party fixed effects. Columns 2 and 4 include congressional district × year fixed effects. The sample consists of elections featuring both a Democratic and a Republican candidate. Standard errors in parentheses are corrected for clusters at the level of the congressional districts. *** p<0.01, ** p<0.05, * p<0.1.

Table A8: Mobile Broadband and Incumbency Advantage, by Unemployment Increase in 2007–2010

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dep. Var.:	Vote share in election t						Win probability in election t					
Election win in $t-1$ ×												
× Dist. has MB	-0.067***	-0.058***	-0.070***				-0.513***	-0.483***	-0.528***			
	(0.013)	(0.018)	(0.020)				(0.066)	(0.097)	(0.097)			
× Dist. got MB after $t+5$				-0.014	-0.019	-0.003				-0.046	-0.044	-0.047
				(0.012)	(0.016)	(0.020)				(0.060)	(0.087)	(0.090)
× Dist. got MB in $t+5$				-0.004	-0.019	0.028				0.034	0.049	0.076
				(0.016)	(0.022)	(0.027)				(0.076)	(0.109)	(0.102)
× Dist. got MB in $t+4$				-0.018	0.016	-0.031				-0.196	-0.029	-0.280
				(0.030)	(0.048)	(0.034)				(0.156)	(0.269)	(0.192)
× Dist. got MB in $t+3$				-0.013	-0.029	0.013				-0.010	0.173*	-0.227
				(0.022)	(0.031)	(0.030)				(0.171)	(0.097)	(0.321)
× Dist. got MB in $t+2$				0.004	-0.033	0.045				-0.014	-0.129	0.121
				(0.023)	(0.038)	(0.028)				(0.111)	(0.151)	(0.160)
× Dist. got MB in t				-0.068***	-0.063***	-0.071***				-0.505***	-0.432***	-0.610***
				(0.016)	(0.021)	(0.026)				(0.087)	(0.111)	(0.135)
× Dist. got MB in $t-1$				-0.090***	-0.095***	-0.075**				-0.640***	-0.796***	-0.523***
				(0.024)	(0.033)	(0.033)				(0.129)	(0.196)	(0.161)
Observations	1,131	587	544	1,131	587	544	1,131	587	544	1,131	587	544
Mean dep. var	0.477	0.479	0.475	0.477	0.479	0.475	0.456	0.468	0.443	0.456	0.468	0.443
Full sample	✓			✓			✓			✓		
Below-median increase in unemployment rate in 2007-2010		✓			✓			✓			✓	
Above-median increase in unemployment rate in 2007-2010			✓			✓			✓			✓
Excl. redist. districts	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
All controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Note: MB = Mobile Broadband. This table presents the results of estimating Equation (2) for subgroups differentially affected by the Great Recession. The unit of observation is a congressional district. In Columns 1–6, the outcome variable is the Democratic Party's vote share in congressional district i in period t. In Columns 7–12, the outcome variable is a dummy for whether the Democratic Party won the election in congressional district i in period t. Baseline controls include year and congressional district fixed effects, linear trends in the Democratic Party's vote margin in congressional district i in period $t-1$ (separately for races that Democrats won and lost), *Election win in period* $t-1$, and the variables interacted with *Election win in period* $t-1$. The sample consists of elections before 2012, featuring both a Democratic and a Republican candidate in districts where the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$ in states that did not experience redistricting between elections at time $t-1$ and time t. Columns 1, 4, 7, and 10 present the results for the full sample of congressional districts with nonmissing unemployment data. Columns 2, 5, 8, and 11 present the results for the subsample of districts where the unemployment rate increased by less than the median unemployment increase in 2007–2010. Columns 3, 6, 9, and 12 present the results for the subsample of districts where the unemployment rate increased by more than the median unemployment increase in 2007–2010. Standard errors in parentheses are corrected for clusters at the level of the congressional districts. *** p<0.01, ** p<0.05, * p<0.1.

Table A9: Mobile Broadband and Incumbency Advantage, by Housing Price Decline in 2007–2010

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dep. Var.:	Vote share in election t						Win probability in election t					
Election win in $t-1$ ×												
× Dist. has MB	-0.060***	-0.052***	-0.055***				-0.458***	-0.402***	-0.483***			
	(0.012)	(0.016)	(0.018)				(0.068)	(0.103)	(0.097)			
× Dist. got MB after $t+5$				-0.013	-0.004	-0.023				-0.052	-0.070	-0.058
				(0.012)	(0.019)	(0.015)				(0.056)	(0.086)	(0.073)
× Dist. got MB in $t+5$				-0.004	-0.022	0.016				-0.063	-0.213*	0.066
				(0.015)	(0.023)	(0.020)				(0.077)	(0.124)	(0.094)
× Dist. got MB in $t+4$				-0.016	0.004	-0.060**				-0.214	-0.195	-0.324
				(0.023)	(0.032)	(0.027)				(0.134)	(0.142)	(0.340)
× Dist. got MB in $t+3$				-0.005	0.001	0.002				0.042	0.321***	-0.011
				(0.022)	(0.067)	(0.024)				(0.161)	(0.109)	(0.195)
× Dist. got MB in $t+2$				0.002	0.033	-0.030				-0.021	0.093	-0.120
				(0.020)	(0.033)	(0.026)				(0.101)	(0.149)	(0.160)
× Dist. got MB in t				-0.061***	-0.052**	-0.057***				-0.460***	-0.426***	-0.488***
				(0.015)	(0.023)	(0.021)				(0.089)	(0.151)	(0.116)
× Dist. got MB in $t-1$				-0.079***	-0.074***	-0.083**				-0.583***	-0.606***	-0.583***
				(0.022)	(0.026)	(0.037)				(0.126)	(0.166)	(0.208)
Observations	1,323	594	729	1,323	594	729	1,323	594	729	1,323	594	729
Mean dep. var	0.477	0.473	0.481	0.477	0.473	0.481	0.460	0.443	0.473	0.460	0.443	0.473
Full sample	✓			✓			✓			✓		
Above-median housing price decline in 2007-2010		✓			✓			✓			✓	
Below-median housing price decline in 2007-2010			✓			✓			✓			✓
Excl. redist. districts	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
All controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Note: MB = Mobile Broadband. This table presents the results of estimating Equation (2) for subgroups differentially affected by the Great Recession. The unit of observation is a congressional district. In Columns 1–6, the outcome variable is the Democratic Party's vote share in congressional district i in period t. In Columns 7–12, the outcome variable is a dummy for whether the Democratic Party won the election in congressional district i in period t. Controls include year and congressional district fixed effects, linear trends in the Democratic Party's vote margin in congressional district i in period $t-1$ (separately for races that Democrats won and lost), *Election win in period* $t-1$, and the variables interacted with *Election win in period* $t-1$. The sample consists of elections that took place prior to 2012, featuring both a Democratic and a Republican candidate in districts where the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$ in states that did not experience redistricting between elections at time $t-1$ and time t. Columns 1, 4, 7, and 10 present the results for the full sample of congressional districts that do not have missing data on housing prices. Columns 2, 5, 8, and 11 present the results for the subsample of districts where the average housing values fell by more than the median decline in 2007–2010. Columns 3, 6, 9, and 12 present the results for the subsample of districts where the average housing values fell by less than the median decline in 2007–2010. Standard errors in parentheses are corrected for clusters at the level of the congressional districts. *** p<0.01, ** p<0.05, * p<0.1.

Table A10: Incumbency Advantage Over Time, Period-Specific Optimal Bandwidths

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. Var.:	Vote share in election t				Win probability in election t			
Election win in $t-1$ ×								
$1974 < t \leq 1980$	0.106***	0.106***	0.100***	0.103***	0.547***	0.547***	0.493***	0.501***
	(0.024)	(0.024)	(0.025)	(0.025)	(0.090)	(0.090)	(0.097)	(0.099)
$1980 < t \leq 1988$	0.123***	0.127***	0.123***	0.126***	0.600***	0.636***	0.527***	0.577***
	(0.016)	(0.018)	(0.016)	(0.020)	(0.065)	(0.081)	(0.069)	(0.092)
$1988 < t \leq 1996$	0.100***	0.097***	0.092***	0.092***	0.530***	0.521***	0.487***	0.507***
	(0.012)	(0.012)	(0.012)	(0.013)	(0.060)	(0.068)	(0.061)	(0.071)
$1996 < t \leq 2004$	0.118***	0.114***	0.107***	0.111***	0.749***	0.740***	0.646***	0.582***
	(0.018)	(0.017)	(0.018)	(0.016)	(0.047)	(0.058)	(0.051)	(0.061)
$2004 < t \leq 2010$	0.070***	0.071***	0.072***	0.071***	0.295***	0.285***	0.277***	0.247***
	(0.014)	(0.015)	(0.014)	(0.015)	(0.085)	(0.087)	(0.091)	(0.095)
$2010 < t \leq 2018$	0.055***	0.064***	0.045***	0.060***	0.281***	0.360***	0.185**	0.288***
	(0.016)	(0.015)	(0.016)	(0.014)	(0.081)	(0.091)	(0.084)	(0.098)
$2018 < t \leq 2024$	0.035***	0.026***	0.028***	0.030***	0.387***	0.435***	0.316***	0.432***
	(0.010)	(0.008)	(0.011)	(0.009)	(0.089)	(0.101)	(0.089)	(0.105)
Observations	2,857	2,093	2,828	2,049	3,332	2,464	3,298	2,422
Mean dep. var	0.478	0.476	0.477	0.475	0.465	0.451	0.464	0.448
Excluding redistricted districts		✓		✓		✓		✓
Congressional district FEs			✓	✓			✓	✓
Baseline controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: This table presents the results of estimating Equation (1) for different time periods, using time-specific optimal bandwidths reported in Appendix Table A2. The unit of observation is a congressional district. In Columns 1–4, the outcome variable is the Democratic Party's vote share in congressional district i in period t. In Columns 5–8, the outcome variable is a dummy for whether the Democratic Party won the election in congressional district i in period t. Baseline controls include year fixed effects and linear trends in the Democratic Party's vote margin in congressional district i in period $t-1$, separately for races that Democrats won and lost and each time period. In Columns 3–4 and 7–8, controls also include congressional district fixed effects. The sample consists of elections featuring both a Democratic and a Republican candidate in districts where the Democratic Party's margin of victory or defeat was less than 20 percentage points in period $t-1$. In the even-numbered columns, the sample includes only states that did not experience redistricting between elections at time $t-1$ and time t. Standard errors in parentheses are corrected for clusters at the level of the congressional districts. *** p<0.01, ** p<0.05, * p<0.1.

Table A11: Mobile Broadband and Incumbency Advantage, Period-Specific Optimal Bandwidths

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. Var.:	Vote share in election t				Win probability in election t			
Election win in $t-1$ ×								
× District has MB	-0.068***	-0.054***			-0.372***	-0.403***		
	(0.009)	(0.010)			(0.054)	(0.055)		
× District got MB after $t+5$			-0.003	-0.014			-0.018	-0.073
			(0.009)	(0.010)			(0.037)	(0.047)
× District got MB in $t+5$			0.013	0.002			0.092*	-0.035
			(0.013)	(0.013)			(0.051)	(0.062)
× District got MB in $t+4$			-0.013	-0.010			0.032	-0.074
			(0.016)	(0.017)			(0.070)	(0.086)
× District got MB in $t+3$			-0.024*	-0.011			0.064	-0.002
			(0.014)	(0.015)			(0.073)	(0.081)
× District got MB in $t+2$			-0.012	-0.013			0.019	-0.041
			(0.014)	(0.015)			(0.054)	(0.067)
× District got MB in t			-0.067***	-0.054***			-0.367***	-0.411***
			(0.011)	(0.013)			(0.070)	(0.074)
× District got MB in $t-1$			-0.083***	-0.080***			-0.412***	-0.548***
			(0.016)	(0.019)			(0.107)	(0.105)
Observations	1,901	1,855	1,901	1,855	1,901	1,855	1,901	1,855
Mean dep. var	0.474	0.473	0.474	0.473	0.449	0.446	0.449	0.446
Excluding redistricted districts	✓	✓	✓	✓	✓	✓	✓	✓
Congressional district FEs		✓		✓		✓		✓
Baseline controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: MB = Mobile Broadband. This table presents the results of estimating Equation (2), using time-specific optimal bandwidths reported in Appendix Table A2. The unit of observation is a congressional district. In Columns 1–4, the outcome variable is the Democratic Party's vote share in congressional district i in period t. In Columns 5–8, the outcome variable is a dummy for whether the Democratic Party won the election in congressional district i in period t. Baseline controls include year fixed effects, linear trends in the Democratic Party's vote margin in congressional district i in period $t-1$ (separately for races that Democrats won and lost), *Election win in period* $t-1$, and the variables interacted with *Election win in period* $t-1$. In the even-numbered columns, controls also include congressional district fixed effects. The sample consists of elections prior to 2012 featuring both a Democratic and a Republican candidate in districts where the Democratic Party's margin of victory or defeat was less than the period-specific optimal bandwidth in period $t-1$ in states that did not experience redistricting between elections at time $t-1$ and time t. Standard errors in parentheses are corrected for clusters at the level of the congressional districts. *** p<0.01, ** p<0.05, * p<0.1.

Table A12: Mobile Broadband and Incumbency Advantage, by White House status

	(1)	(2)	(3)	(4)
Dep. Var.:	Vote share in election t		Win probability in election t	
Election win in $t-1$ × District has MB ×				
× Republican president	-0.033	-0.015	-0.073	-0.240*
	(0.020)	(0.021)	(0.092)	(0.126)
× Democratic president	-0.076***	-0.088***	-0.551***	-0.766***
	(0.013)	(0.019)	(0.075)	(0.111)
Observations	593	505	593	505
P-value: $\gamma[RepPres.] = \gamma[DemPres.]$	0.067	0.004	0.000	0.002
Excluding redistricted districts	✓	✓	✓	✓
Congressional district FEs		✓		✓
All controls	✓	✓	✓	✓

Note: This table presents the results of estimating Equation (3). The unit of observation is a congressional district. In Columns 1–2, the outcome variable is the Democratic Party's vote share in congressional district i in election t. In Columns 3–4, the outcome variable is a dummy for whether the Democratic Party won congressional district i in election t. The sample consists of elections from 1998 to 2010 featuring both a Democratic and Republican candidate in states that did not experience redistricting between elections at time $t-1$ and time t and districts where the Democratic Party's margin of victory or defeat in election $t-1$ was less than 20 percentage points. Baseline controls include year fixed effects, linear trends in the Democratic Party's vote margin in congressional district i in election $t-1$ (separately for races that Democrats won and lost), the direct effects of mobile broadband (separately for years with a Democratic and Republican president), and a dummy variable for whether the Democratic Party won congressional district i in election $t-1$ (separately for years with a Democratic and Republican president). Standard errors in parentheses are corrected for clusters at the level of the congressional districts. *** p<0.01, ** p<0.05, * p<0.1.