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3G Mobile Internet and Incumbency Advantage

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Abstract

This thesis examines the impact of the dissemination of mobile internet on incumbency advantage in the U.S. House of Representatives and state legislative elections from 1976 to 2022. Prior to the introduction of mobile internet, incumbents enjoyed significant electoral benefits, with vote share premiums of approximately 10 and 7 percentage points in congressional and state legislative elections, respectively. However, following the adoption of 3G mobile internet, this advantage decreased by nearly 60% in the House of Representatives and 40% in state legislative elections. An event study confirms this decline occurred only after the introduction of mobile internet.

Keywords: Elections, Incumbency Advantage, Media, Mobile Internet

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I Introduction

Has mobile internet affected candidate's probability of getting re-elected?

The arrival of 3G mobile internet drastically changed the way information is acquired and disseminated, fundamentally altering communication and information technologies. This innovation allowed people to access the internet from their smartphones, enabling them to acquire and share information anytime, anywhere. This unprecedented connectivity served as a prelude to a new era of social interaction and information exchange, with profound implications for political processes worldwide.

One notable impact of the introduction mobile internet is the democratization of information creation and distribution. Citizens are no longer passive consumers of news. Through social media and other on-line platforms, people can create their own content and reach audiences far beyond their immediate social circle, creating vast networks that rival traditional media outlets. This has shifted power dynamics in the media landscape, as politicians and public figures are now under intense scrutiny from a multitude of independent observers. Every action, whether public or private, can quickly become the subject of widespread discussion, placing leaders under a magnifying glass like never before.

This increased access to information has mixed outcome possibilities. On the one hand, it promotes accountability, as politicians' actions can be swiftly highlighted, analyzed, and criticized. Corruption scandals, missteps, or unethical behaviors are easily unveiled, forcing leaders to be more mindful of their conduct. On the other hand, the sheer speed of unverified information diffusion has contributed to the rise of misinformation and disinformation, with false narratives spreading as rapidly as factual ones.

The expansion of mobile internet has also changed political engagement. Voters have access to an endless amount of information, which radically changes the way they interact with politics. At the same time, politicians have adapted and reshaped their communication strategies to take full advantage of these innovations, extending their reach beyond traditional media formats and now resorting to tweets, Instagram stories and TikToks. Moreover, it appears that the general population sees a positive effect from social media, an outlet that is intrinsically connected with mobile internet, on democracy; the public is generally more informed but people are also aware

that it is easier to distort facts and spread misinformation. Americans, in contrast, seem to think that the bad outweighs the good and that overall mobile internet has a slightly more negative effect on society and on democracy (Pew Research Center 2022).

Coincidentally, reports such as those by the Pew Research Center, show declining confidence in national governments, with only 22% of Americans over the age of 15 expressing trust in their government, while in 2004, for comparison, this number was almost double (Pew Research Center 2024). This growing discontentment with government officials is often linked to the pervasive nature of mobile internet, which increases political awareness by quickly exposing governance failures, corruption, and inequalities in real-time, leaving little room for errors to be hidden or glossed over. Guriev, Melnikov, and Zhuravskaya (2020) confirm this, estimating that the expansion of 3G mobile internet increased public belief that their government is corrupt by 1.4%, ultimately decreasing trust in national governments by 2.5%. In light of this, one would expect that the increased political awareness and discontentment would translate into candidates having more trouble being reelected nowadays than they had 30 years ago. The starting point of this analysis is then the evolution of the incumbency advantage, that later evolves into connecting the role of the internet, if any.

In this thesis, we look at the electoral advantage to incumbency, defining it as the impact that being the incumbent party in a certain district has on the votes the party obtains in the following district elections, looking at congressional, but also state legislative elections for the period of 1976 until 2022. We begin by examining elections of the U.S. House of Representatives, a particularly compelling case for studying incumbency advantage due to historically high reelection rates for incumbents. Previous research by Lee (2008) has estimated this advantage to increase a party's vote share by as much as 7.8 percentage points. We then extend the analysis by comparing these results with those derived from state legislative elections, in particular, state house elections.

The results obtained confirm our hypothesis that the electoral advantage of incumbency has been decreasing in recent decades, by approximately 60% and 40% when compared to their estimates in the 70's until the early 00's, for congressional and state legislative elections, respectively. Furthermore, an event study connects this decrease with the introduction and diffusion of 3G mobile internet coverage. These results are statistically significant and robust to

congressional and state legislative elections.

This thesis is organized as follows: in section II we do a brief overview of the literature on incumbency advantage, going over some of the political implications of the media expansion, and political landscape of the 21st century. In section III, we describe the data used for this work and the identification strategy performed to arrive at our conclusions. In section IV, we present the results and an event study, and finally in section V, we conclude this analysis and summarize the findings obtained.

II Literature Review

Mobile internet has profoundly reshaped the political setting across the globe by influencing how citizens engage with politics, access information, and participate in elections. The ramifications of this technological shift are endless and its implications are complex and often context-dependent, with varying effects on voter turnout, electoral competitiveness, and incumbency advantage.

Campante, Durante, and Sobbrío (2018) have found political activism to benefit from the increased availability of mobile internet, particularly noting a positive connection between the presence of local activists and the existence of broadband mobile internet, in Italy. By lowering communication barriers, mobile internet allows individuals to expand their networks and influence, while grassroots protest groups are able to leverage digital tools to organize, build connections and mobilize both resources and people more effectively.¹ These tools facilitate faster growth and quicker development of such movements, amplifying their capacity to rally support.

Although it would also be expected that this increase in civic engagement translated into a higher mobilization on election days, research shows otherwise. Higher penetration of mobile internet coverage has been found to decrease voter's turnout (Gavazza, Nardotto, and Valletti 2018, Guriev, Melnikov, and Zhuravskaya 2020, Melnikov 2023), particularly impacting those younger, with lower education and lower economic status (Falck, Gold, and Heblich 2014). In turn, Campante, Durante, and Tesei (2023) have also reported that in the periods right after the

1. Grassroots protest groups are a type of community-driven movement or campaign that attempts to mobilize individuals or groups of individuals to influence an outcome, usually political.

introduction of mobile internet, there is a decrease in election turnout, particularly affecting smaller parties. However, contrarily to other authors, they found that this decrease is quickly mitigated and turnout not only bounces back to previous levels, but actually increases, ultimately having a net positive effect.

Additionally, mobile internet has not only exponentially increased the rate at which credible information can be shared, but also, accessed which is in itself an important vehicle to increase political accountability. Enríquez et al. (2021) highlights how increasing awareness over unethical behavior through targeted advertisements can significantly influence voter behavior. These ads, disseminated to specific audiences, reduce the vote share for incumbent candidates who mismanage their constituencies' budgets. Conversely, incumbents with no budget irregularities benefit from such advertisement, as their performance is positively received and they are rewarded with higher vote shares. Notably, the impact of these advertisements is proportional to the size of the targeted audience.

In Europe, Guriev, Melnikov, and Zhuravskaya (2020) and Gavazza, Nardotto, and Valletti (2018) offer contrasting findings on the impact of mobile internet on incumbency advantage. Gavazza, Nardotto, and Valletti (2018) found that mobile internet decreased the competitiveness of elections, essentially benefiting incumbent parties. In contrast, Guriev, Melnikov, and Zhuravskaya (2020) observed a reduction in incumbency advantage following the arrival of mobile internet, with populist smaller parties—whether leftist or far-right—gaining higher vote shares, particularly after 2010 (Guriev and Papaioannou 2022). These studies illustrate how social media, a tool born out of mobile internet, disproportionately benefits anti-establishment populist parties. Populist leaders, often characterized by their charisma and simplistic solutions, shine in the short-form content formats that social media platforms promote. These formats allow them to disseminate their messages widely while bypassing the fact-checking processes typically found in traditional media.

Simultaneously, new evidence has found that mobile internet and social media exacerbates political polarization. A significant factor contributing to this phenomenon is the formation of echo chambers, where individuals are disproportionately exposed to like-minded, pro-attitudinal content while being shielded from opposing viewpoints. This selective exposure reinforces pre-existing beliefs, creating a feedback loop that amplifies ideological drift among voters (Melnikov

2023). Social media platforms, with its algorithms designed specifically to provide content similar to the one the user already interacts with is a major culprit in fostering filter bubbles that reinforce existing beliefs and contribute to political polarization. At the same time, users themselves are less likely to share content with stances opposed to theirs (Bakshy, Messing, and Adamic 2015).

The problem is further aggravated by the widespread consumption and sharing of fake news, which thrive within these echo chambers. Research indicates that older individuals, particularly those over 65, and Republican-leaning users, are more susceptible to engage with and propagate such misinformation, thereby intensifying the polarizing effects of social media platforms (Guess, Nagler, and Tucker 2019). However, Republican leaning and Democrat leaning voters are almost as likely to believe fake news, as long as these news align with their own ideology (Allcott and Gentzkow 2017). Notwithstanding, there is also evidence that news consumption is not necessarily static nor deterministic and so, the consumption of counter-attitudinal news can be stimulated and, more importantly, can mitigate this polarization and animosity towards other parties, (Campante, Durante, and Tesei 2023).

This thesis contributes to the growing literature on political economy and the effects of information technology by not only documenting the decrease in the incumbency advantage in recent decades in the U.S. House of Representatives and in state legislative elections, but more importantly by establishing a clear connection between this decrease and the onset of 3G mobile internet.

III Data and Identification Strategy

III.A Data

In this section we briefly describe the data sources used in the analysis.

The election data for the U.S. House of Representatives was sourced from the MIT Election Data + Science Lab (Data and Lab, U.S. House 1976–2022), covering elections from 1976 to 2022. This dataset includes detailed information on every candidate, party affiliation, candidate vote counts, and total votes by state, district, and year. Since congressional district boundaries are

redrawn every 10 years following the decennial census, an additional variable was constructed to indicate whether a district was redrawn in a given year. Additionally, the Democratic and Republican vote share was calculated as the sum of votes received by all Democratic candidates divided by the total votes in a given district, state, and year. Similarly, the vote margin of victory was computed by subtracting the Republican vote share from the Democratic vote share for each district-year observation. The final dataset contains 10,775 observations.

The data for state legislative elections was sourced from the Carl Klarner Dataverse, within the Harvard Dataverse (Klarner, State Legislative Election Returns, 1967-2022), covering elections from 1967 to 2022. However, for consistency with the U.S. House analysis, only observations from 1976 onward were retained. The dataset includes information such as the number of votes received by Democratic, Republican, and smaller-party candidates, by state, district, and year. For years in which district boundaries were not redrawn after the census, lagged variables are included. The Democratic vote share and vote margin were calculated using the same methodology as the House of Representatives analysis. The final dataset for state legislative elections contains 93,916 observations.

The data on 3G mobile internet coverage was retrieved from Colin Bartholomew’s Mobile Coverage Explorer, spanning the period from 2008 to 2022. The dataset consists of 1x1-kilometer binary grid cells representing areas covered by mobile networks worldwide. Using QGIS, the grid cell data was overlaid with congressional district maps and state legislative maps obtained from the U.S. Census Bureau. This allowed for the calculation of average 3G mobile coverage within each district and year.

III.B Identification Strategy

The identification strategy used in this thesis is based on the one used by Lee (2008), who employs a Regression Discontinuity Design (RDD) to analyze the incumbency advantage in U.S. House elections, by focusing on cases where candidates win or lose by a narrow margin. In such close races, the inherent variability in vote share—stemming from factors like turnout or random election-day events, is treated as essentially random near the threshold, satisfying the RDD condition of quasi-random treatment assignment.

The key insight is that in two-party races, i.e., where there are strictly two candidates/parties

running against each other and no write-in candidates, the cutoff for winning is typically at a 50% vote share. Crossing this threshold results in a deterministic assignment of incumbency to one party, creating a discontinuity in outcomes. The RDD exploits this discontinuity: if incumbency has a causal effect, it will manifest as a sharp jump in subsequent election outcomes (e.g., vote share or re-election probability) precisely at this threshold.

In cases where minor parties are present, such as ours, the vote shares of the Democratic and Republican parties do not sum to 100% in every district. To address this, Lee (2008) calculates the Democratic vote margin of victory, the difference between the Democratic and the next strongest opponent's vote shares (i.e., the Republican vote share)—defining the cutoff at a zero margin. This approach maintains the necessary sharp threshold for treatment assignment, while accounting for multi-party contexts. Thus, any observed discontinuity in outcomes at this margin reflects the causal effect of incumbency.

His results were proven to be robust across various specifications, and he also performs validity checks, such as ensuring that pre-determined characteristics and electoral outcomes of districts are balanced on either side of the cutoff. These checks strengthen confidence in the causal inferences drawn from the RDD, demonstrating that the observed effects are attributable to incumbency rather than confounding factors. As in Lee (2008), the incumbency advantage in this empirical work is analyzed at the party, not at the candidate level.

Given this, our regression specification is the following:

$$Y_{i,t} = \alpha + \beta D_{i,t-1} + \gamma D_{i,t-1} \cdot V_{i,t-1} + \theta R_{i,t-1} \cdot V_{i,t-1} + \tau_t \quad (1)$$

where i is a congressional, or state legislative, district indicator and t is a year index. Y is the vote share of the democratic party, V is the democratic party vote share margin of victory, if $V_{i,t-1} > 0$, the Democratic party is the incumbent party, if not, by construction, the Republican party is the incumbent party. D and R are binary variables, representing the winning party. τ_t represents year fixed effects.

This study is primarily interested in how the incumbency advantage evolves over time. To examine it, the specification was estimated for nine distinct periods, excluding observations where redistricting occurred and races without both Democratic and Republican candidates.

To ensure variability in the dependent variable, the sample was further restricted to observations where the vote margin was between -0.2 and 0.2. This restriction helps isolate elections with inherently competitive outcomes, which are critical for identifying variations in incumbency advantage.

Moreover, this thesis sets out to test whether the introduction of 3G mobile internet influenced the evolution of incumbency advantage, with our hypothesis being that the increased access to mobile internet diminished the incumbency advantage. To this end, new variables were introduced to capture this effect, with the revised regression specification detailed below.

$$Y_{i,t} = \alpha + \beta D_{i,t-1} + \lambda 3G_{i,t} + \gamma D_{i,t-1} \cdot V_{i,t-1} + \theta R_{i,t-1} \cdot V_{i,t-1} + \omega D_{i,t-1} \cdot 3G_{i,t} + \tau_t \quad (2)$$

where i is a congressional, or state legislative, district indicator and t is a year index. Y is the vote share of the Democratic party, V is the Democratic party vote share margin of victory, if $V_{i,t-1} > 0$, the Democratic party is the incumbent party, if not, the Republican party is the incumbent party. D and R are binary variables, representing the winning party. τ_t represents year fixed effects. Additionally, $3G$ is the calculated average of the 3G mobile internet coverage by district and year.

For this specification, the treatment group consists of districts where mobile internet was made available (i.e., where the calculated average mobile internet coverage indicator is greater than 0). Conversely, the control group comprises districts where mobile internet was not yet available. To ensure comparability between the two groups, the same restrictions from the original specification are applied.

Notably, after 2012, virtually all districts had access to mobile internet. Including such observations would primarily compare districts treated earlier with those treated later. In cases where treatment effects vary over time, such comparisons can result in the assignment of negative weights on the treatment effect for certain groups, that then bias the overall estimated treatment effect. According to Chaisemartin and D'Haultfœuille (2020), this likelihood of attributing negative weights to certain periods is higher when the periods under analysis have a large fraction of treated groups, and groups that have been treated for long periods.

As previously mentioned, districts with no mobile internet coverage are virtually nonexistent in 2012. Thus, not restricting our sample would fall under the situation described above, potentially resulting in the assignment of negative weights biasing the analysis, in the presence of time-dependent treatment effects. To avoid this, we restrict the sample to only include periods prior to 2012.

IV Results

IV.A Decline in Incumbency Advantage

Figure 1: Regression Discontinuity (RD) plots using data from the House of Representatives elections over different time periods. The vertical axis represents the vote share of the Democratic party in period $t + 1$, in function of the vote margin of victory obtained at election t , with the cutoff at 0. To the right of the horizontal axis the Democratic candidate has been elected, and to the left they have not.

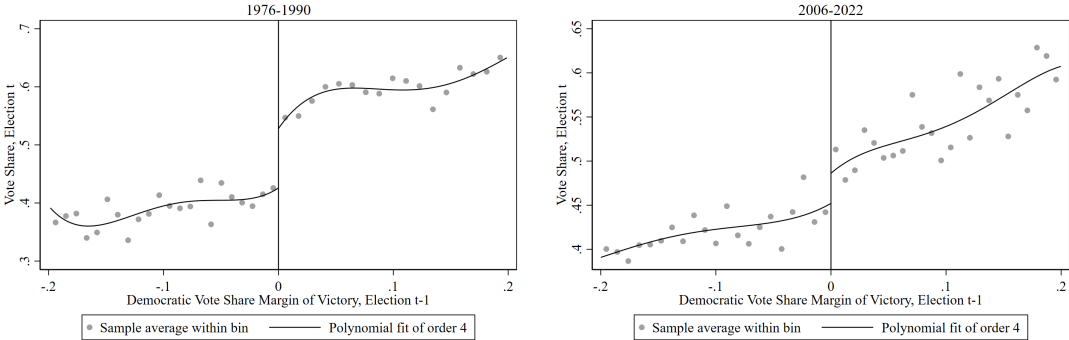
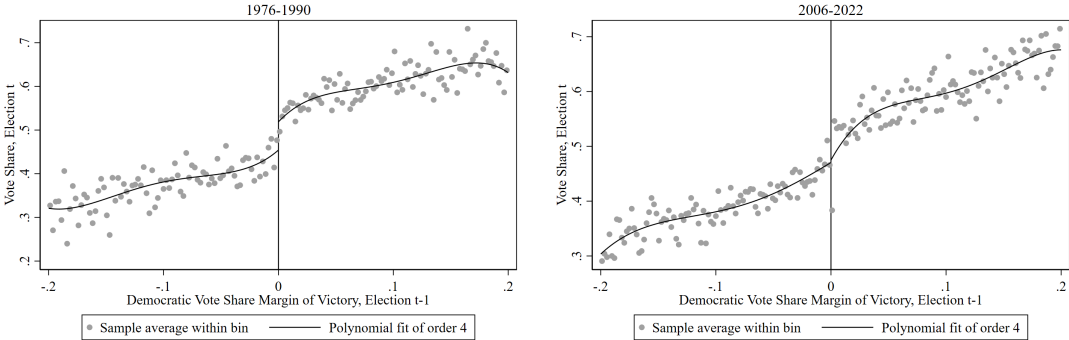


Figure 2: Regression Discontinuity (RD) plots using data from the state legislative elections, analogous to Fig.1.



Figures 1 and 2 represent the RD plots for the elections at the congressional level - with the House of Representatives elections - and at the state level - with the State House elections - in the first and last 15 years of our sample.

Focusing on the first panels from both figures, that is, on the first 15 years of our sample, there is a discontinuous jump in vote share outcomes at the threshold, both for congressional and state legislative elections, although more apparent in congressional elections. More importantly, though, is the fact that when comparing those plots to the ones covering the last period, there is a clear decrease in the size of the incumbency advantage over time, as can be seen by the change in vote share at the 0 margin of victory cutoff.

For state legislative elections, illustrated by Figure 2, there is an even more drastic change. Although the jump in vote share is not as large as in the congressional elections, when we compare the first period with the most recent one, the impact of incumbency on candidates' vote shares appears to have diminished over time, virtually disappearing in the last 15 years.

Figures 3 and 4, pictured bellow, illustrate the estimated coefficients of the independent variable D_{t-1} , as well as their respective confidence intervals, from specification (1). In other words, these figures illustrate the evolution of the vote share premiums attributed to incumbents over multiple time periods, for the congressional and state legislative elections, respectively. The red line marks the period where 3G mobile internet was introduced, while the grey line indicates the bonus in vote share incumbents were awarded, prior to 2008.

Both graphs signal the same message: from the 70's until the early 00's the premiums in vote share attributed to incumbency remained relatively stable for both congressional and state elections. After 2006, there is a decreasing trend in the electoral benefits traditionally associated with incumbency, indicated by the estimated coefficient itself and its confidence interval.

Figure 3: Electoral advantage of incumbency for House of Representatives elections over time, with the vertical axis representing the vote share premium attributed simply by being in-office. The average incumbency advantage before the introduction of 3G mobile internet is also reported.

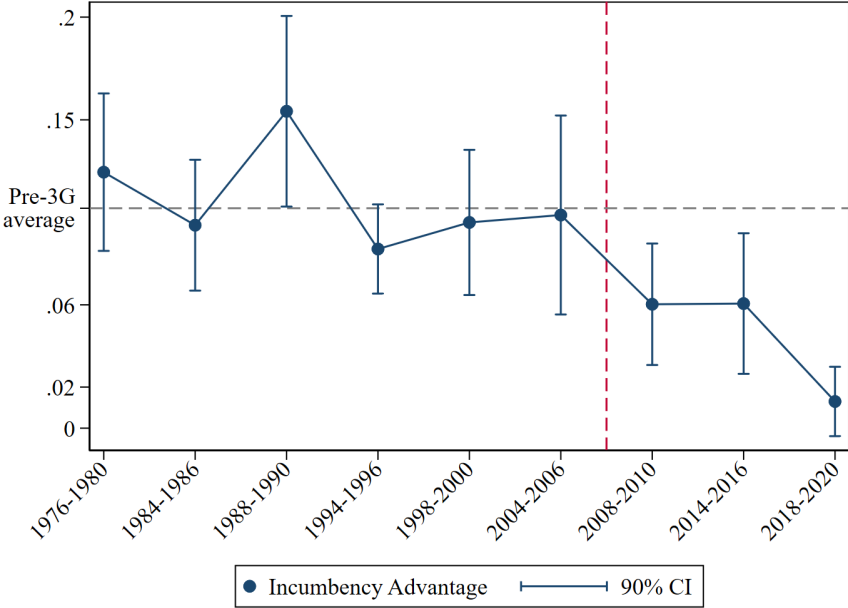


Figure 4: Electoral advantage of incumbency in state legislative elections over time, analogous to Fig.3.

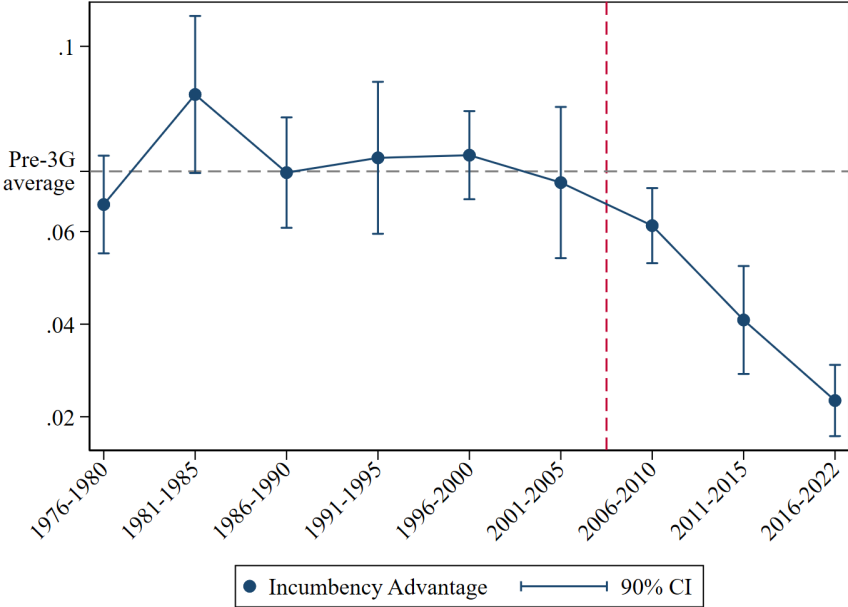


Table 1: RDD regressions for multiple time periods before and after the introduction of 3G mobile internet for the House of Representatives and state legislative elections.

	(1)		(2)
Election	House		State House
<i>Dep. Var.:</i>	<i>Democrat party vote share t</i>		
Dem. Win $t_{-1} \times$		Dem. Win $t_{-1} \times$	
$\times t = [76-80]$	0.125*** (0.0232)	$\times t = [76-80]$	0.0655*** (0.0064)
$\times t = [80-86]$	0.0988*** (0.0193)	$\times t = [81-85]$	0.0902*** (0.0104)
$\times t = [88-90]$	0.154*** (0.0281)	$\times t = [86-90]$	0.0724*** (0.0073)
$\times t = [94-96]$	0.0872*** (0.0132)	$\times t = [91-95]$	0.0759*** (0.01)
$\times t = [98-00]$	0.100*** (0.0214)	$\times t = [96-00]$	0.0765*** (0.0058)
$\times t = [04-06]$	0.104*** (0.0294)	$\times t = [01-05]$	0.0706*** (0.01)
$\times t = [08-10]$	0.0603*** (0.0179)	$\times t = [06-10]$	0.0613*** (0.0049)
$\times t = [14-16]$	0.0606*** (0.0207)	$\times t = [11-15]$	0.0409*** (0.0071)
$\times t = [18-20]$	0.0130 (0.0102)	$\times t = [16-22]$	0.0238*** (0.0047)
Observations	2,117		15,764
R-squared	0.611		0.486
Number of Clusters	431		3,523
Year FE	Yes		Yes

Notes: Table 1 presents RDD regression outcomes with the dependent variable being the vote share at election t for the Democratic Party. Column 1 presents the results for the House of Representatives while column 2 presents the results for the State Legislature. The key independent variable " $Dem. Win_{t-1}$ " is a binary variable, taking the value 1 if the Democratic Party won the elections in that district in the previous period and 0, if not. This variable is then interacted with multiple dummy variables representing time periods from 1976 until 2020. The years 1982, 1992, 2002 and 2012 are not included in the House of Representatives analysis as dependent variables because of the aforementioned redistricting process taking place every 10 years. For the state legislative elections analysis, the time periods included are slightly different to cover observations of off-years elections. Additionally, both regressions include interactions between the time periods, incumbent party and vote share margin of victory obtained by the Democratic party in the previous period. It is also reported the number of clusters and the clustered standard errors, calculated at the congressional and state legislative district level, reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 1 presents the results estimating the electoral gain Democratic incumbent candidates are granted, using specification (1).

In conjunction with the plots presented in Figures 1 through 4, the results clearly illustrate a significant decline in the incumbency advantage, measured in terms of vote share, over time.

These findings are statistically significant at the 5% level for all periods analyzed, with the exception of the final House of Representatives election period.

Before 2008, incumbents parties running for the House of Representatives benefited from a substantial advantage, gaining on average 10.7 percentage points higher vote share compared to non-incumbents, holding all else constant. However, this advantage experienced a sharp decline after the introduction of mobile internet. It dropped more than 4 percentage points post-2008, marking a stark reduction in electoral support for incumbent candidates.

For state legislative elections, the incumbency advantage, while significant, was smaller in magnitude when compared to House elections. Before 2008, incumbents enjoyed an estimated advantage of 7.3 percentage points in vote share, in average, *ceteris paribus*. However, following the introduction of mobile internet, this advantage progressively diminished. In the period during which mobile internet was introduced, the predicted increase in vote share for incumbents decreased to approximately 6 percentage points. This trend continued in subsequent periods, with the advantage declining further to 4.09 percentage points and, in the final observed period, falling to just 2.38 percentage points.

The results indicate that there was a significant erosion of electoral support for incumbents over time, more specifically, after 2008, when mobile internet was introduced. The democratization of information likely disrupted traditional electoral dynamics that favored incumbents, such as greater name recognition, resource advantages, and the ability to control narratives through traditional media channels. Mobile internet provides voters with more direct access to diverse and independent sources of information, potentially reducing reliance on incumbents' established media influence. Additionally, it may have increased scrutiny of incumbent performance, holding them more accountable for their actions and amplifying any dissatisfaction.

The magnitude of the decrease and the consistency between both election cases leads us to believe that the distribution of 3G mobile internet is, in fact, related to this decrease, which we analyze in the next subsection.

IV. B The role of 3G

Figure 5: 3G mobile internet coverage in 2008, by congressional district.

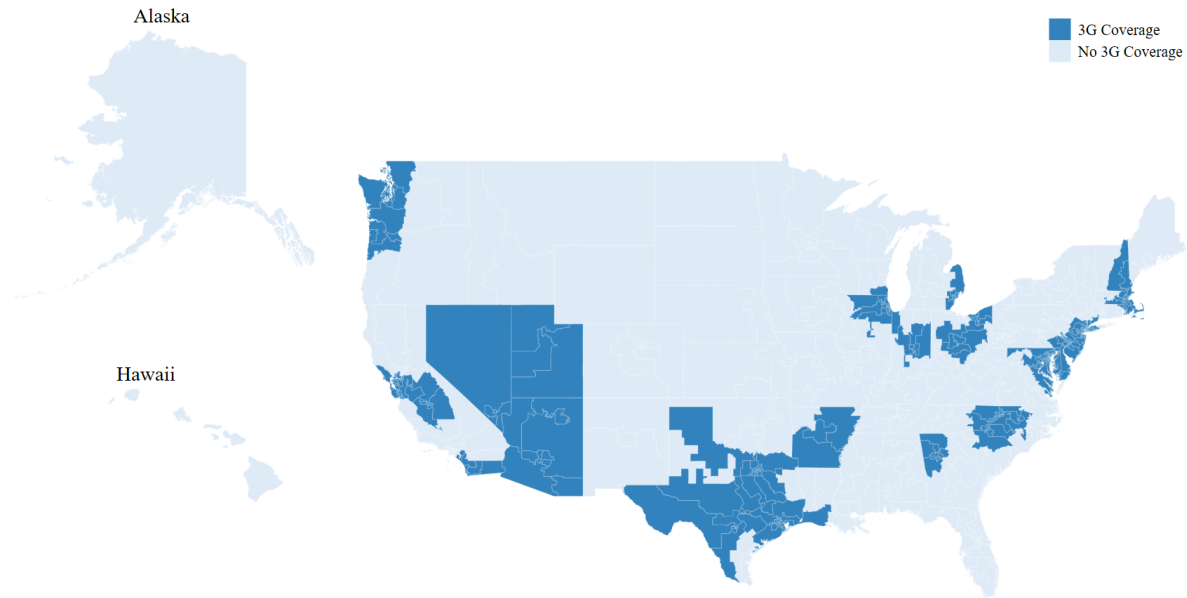
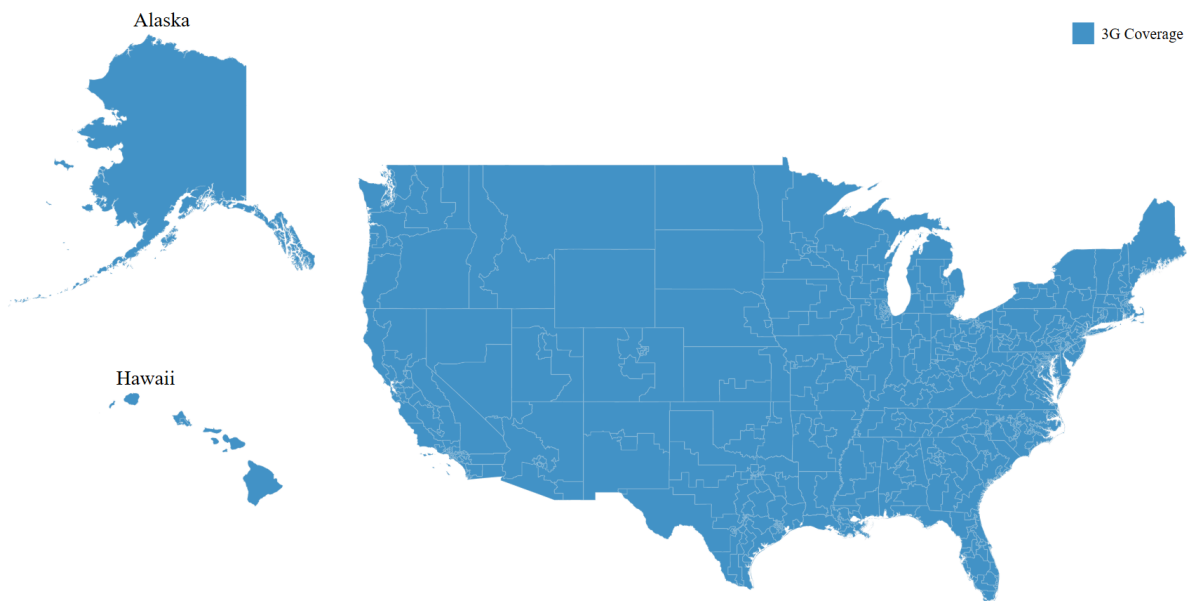


Figure 6: 3G mobile internet coverage in 2012, by congressional district.



Figures 5 and 6 depict the coverage of the mobile broadband internet in 2008 and 2012 by congressional districts.

While in 2008, mobile internet coverage was limited with very few districts being able to access it, by 2012 this picture has become reversed, mobile internet is now freely available with every congressional district covered. This rapid expansion of mobile internet coincides with the sharp decline in incumbency advantage observed during this period.

For reference, Appendix Figures 1 and 2 present the same data at the state legislative district level.

Table 2: RDD regressions for the House of Representatives and state legislative elections, now including an interaction for the role of the introduction of 3G.

	(1)	(2)
<i>Dep. Var.:</i>	<i>Democrat party vote share t</i>	
Election	House	State House
Dem. Win t_{-1}	0.100*** (0.00758)	0.0675*** (0.00245)
Dem. Win $t_{-1} \times 3G$ Coverage	-0.0624*** (0.00771)	-0.0285*** (0.00246)
Observations	2,127	15,784
R-squared	0.568	0.485
Number of Clusters	431	3,182
Year FE	Yes	Yes

Notes: Table 1 presents RDD regression outcomes with the dependent variable being the vote shares at election t for the Democratic Party, both for the House of Representatives and the state legislative elections. Column 1 presents the results for the House of Representatives, while column 2 presents the results for the state legislative elections. The key independent variable, "*Dem. Win $t_{-1} \times 3G$ Coverage*" is the interaction between two binary variables, one taking the value 1 if the Democratic Party won the elections in that district in the previous period and 0, if not; while "*3G Coverage*" takes the value of 1 if the district has an average mobile internet coverage higher than 0, and 0 otherwise. It is also reported the number of clusters and the clustered standard errors, calculated at the congressional and state legislative district level, reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2 presents the results estimating the effects of 3G network coverage on incumbent Democrats vote share, using specification (2) for both House and state legislative elections.

The interaction between the variables *Dem.Win t_{-1}* and *3G Coverage* enables us to assess how the introduction of mobile internet affected the incumbency advantage, defined as the increase in vote share obtained by candidates already in office during the subsequent election cycle. The findings illustrate that the arrival of mobile internet significantly reduced the vote share advantage of incumbent candidates in both House of Representatives and state legislative elections. Specifically, for House of Representatives candidates, the introduction of mobile

internet in their respective districts is associated with a decrease of 6.24 percentage points in vote share for the incumbent party. In comparison, state legislative incumbent candidates experienced a smaller, yet still substantial, decline of 2.85 percentage points.

These numbers reflect a significant change when considering the historically strong advantage incumbents have held. For House of Representatives elections, incumbents traditionally enjoyed an estimated vote share advantage of around 10 percentage points. The observed decline, therefore, corresponds to a reduction of approximately 60% in this advantage. Similarly, for state legislative elections, incumbents' typical advantage of 6.75 percentage points was reduced by roughly 40% following the introduction of mobile internet. These results provide compelling evidence that the expansion of mobile internet access significantly undermined the electoral performance of incumbents.

To further support these findings and establish that the reduction in incumbency advantage occurred only after the introduction of mobile internet, we now turn to an event study analysis for both types of elections. The horizontal axis in the event study plots represents the time relative to the treatment year, ranging from all available years before the district gained mobile internet access to the year following its introduction.

Figure 7: Event study using data from the House of Representatives elections over different time periods.

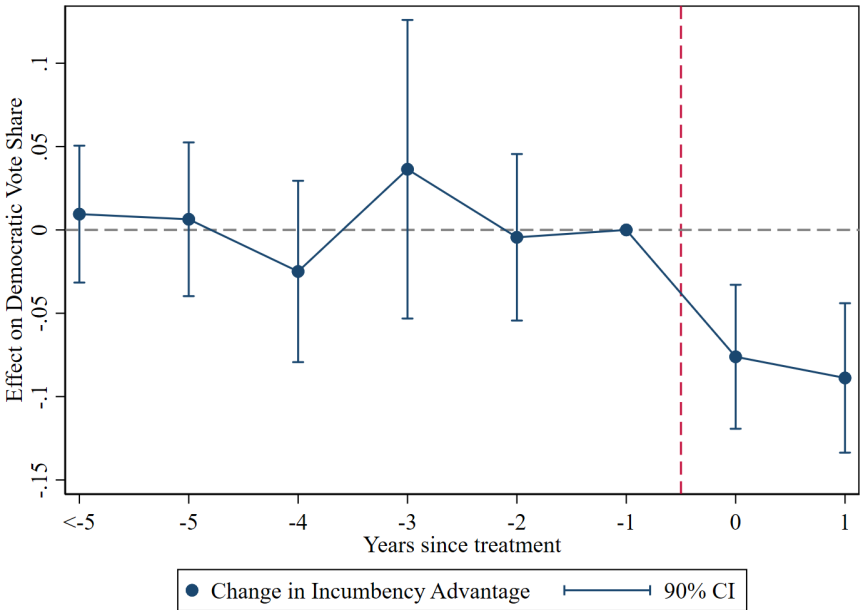
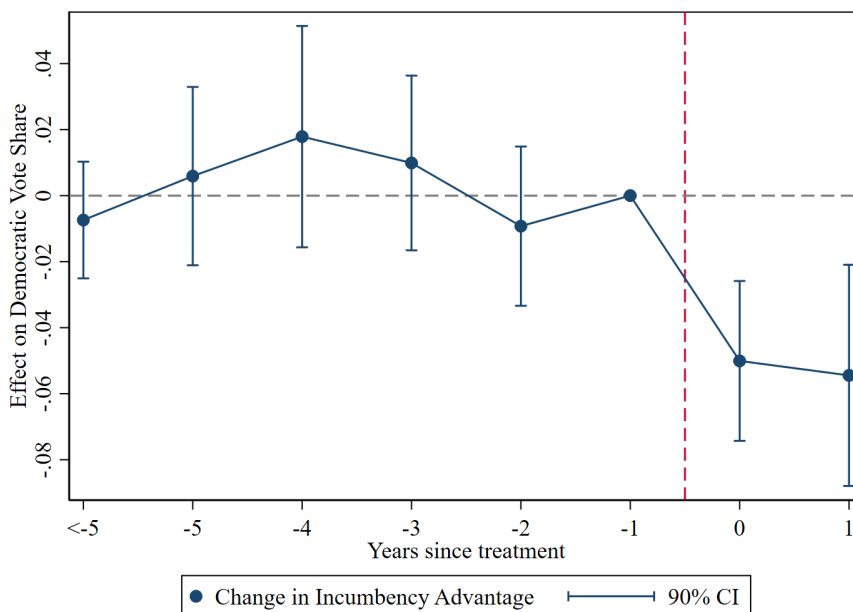


Figure 8: Event study using data from the state legislative elections, analogous to Fig.7.



Figures 7 and 8 represent the event-study estimates, with the evolution of the coefficient of $Dem.Win_{t-1}$ interacted with 3G. The vertical axis represents the change in vote share of the Democratic party in period t . To the left of the horizontal axis, the district has not been exposed to mobile internet, and to the right it has. Appendix Table 1 reports the regression estimates.

These illustrate how this vote share premium associated with incumbency only began to diminish after districts gained access to 3G mobile internet. Both for House of Representatives and state legislative elections, the figures reveal a consistent pattern: the introduction and widespread availability of 3G mobile internet corresponded to a reduction in incumbents' vote share advantage, ranging from 5 to 9 percentage points, in House of Representatives and state legislative elections.² This decline is statistically significant, as demonstrated by the reported standard errors, which show that the results are statistically different from zero at the 90% confidence levels.

The findings are especially noteworthy because they highlight how technological advancements, specifically mobile internet, fundamentally reshaped electoral dynamics. By increasing voter access to alternative sources of information and enabling greater scrutiny of incumbents' performance, mobile internet appears to have diminished the structural advantage traditionally afforded to incumbents. This effect is consistent across both federal (House of Representatives)

2. For further details, refer to Appendix Table 1.

and state-level elections, underscoring the widespread nature of this transformation.

Moreover, the results are not only statistically significant but also not inconsequential. A reduction of 5 percentage points in vote share for an incumbent, when applied to the context of closely contested elections, could easily be the deciding factor in whether the incumbent retains their seat. This demonstrates the substantive electoral implications of mobile internet adoption.

V Conclusion

This thesis investigates the impact of mobile internet on the electoral advantage of incumbency within the context of U.S. House of Representatives and state legislative elections from 1976 to 2022. The findings reveal that, prior to the introduction of mobile internet, incumbents in the House of Representatives and state legislatures enjoyed a significant advantage, with an estimated vote share increase of 10.7 and 7.3 percentage points, respectively. However, after the introduction of mobile internet, with voters gaining greater access to alternative sources of information, including online news and social media, this advantage diminished substantially, with incumbents in the House of Representatives experiencing a 6.24 percentage points reduction in vote share and those in state legislatures seeing a 2.85 percentage points reduction. These changes represent an overall decrease of approximately 60% and 40%, respectively, in the electoral support incumbents traditionally benefited from. Furthermore, an event study analysis confirms that this decline occurred only after the adoption of 3G mobile internet.

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Appendix

Figure 1: 3G Mobile Internet Coverage in 2008, by state legislative district.

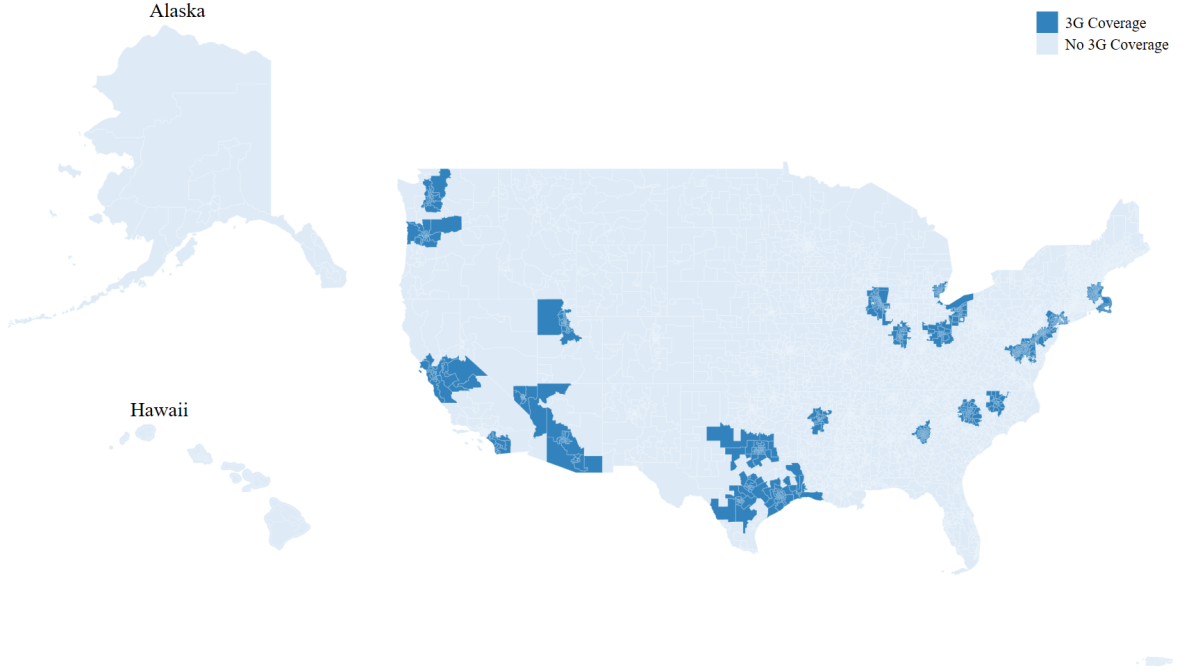


Figure 2: 3G Mobile Internet Coverage in 2012, by state legislative district.

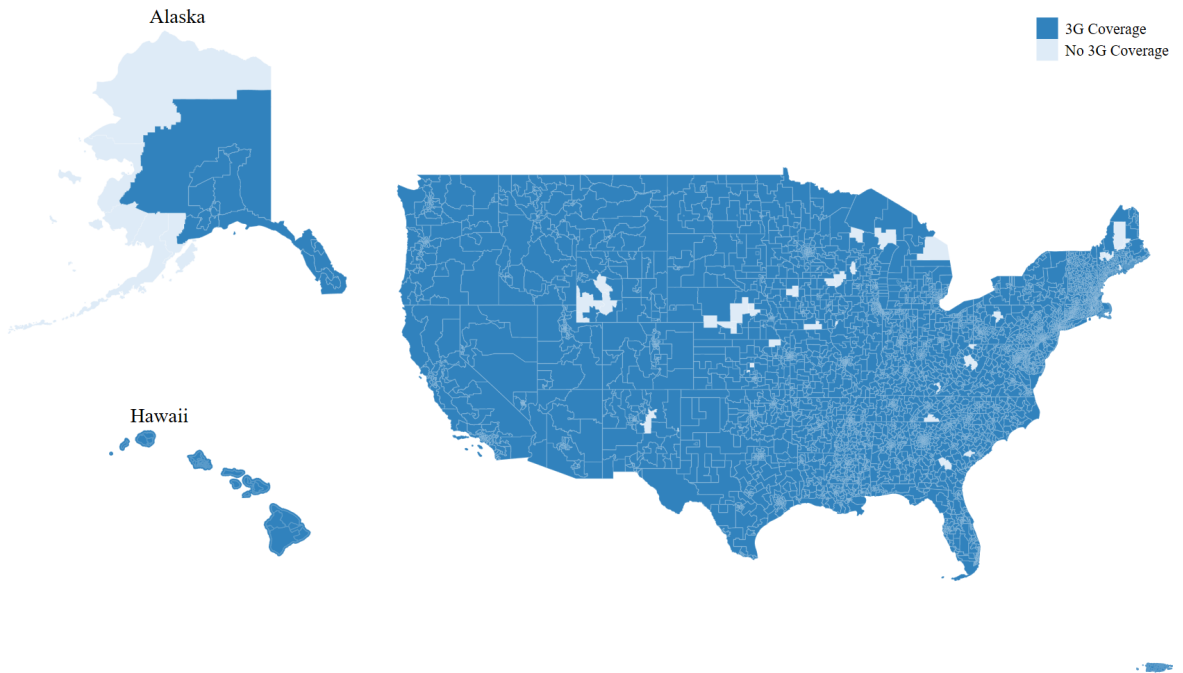


Table 1: Regression results used for the event study graph for congressional and state legislative elections.

	(1)	(2)
<i>Dep. Var.:</i>	<i>Democrat party vote share t</i>	
Election	House	State House
Dem. Win t_{-1}	0.110*** (0.0245)	0.121*** (0.0112)
Rep. Win $t_{-1} \times$ Vote Margin t_{-1}	0.294*** (0.0432)	0.624*** (0.0360)
Dem. Win $t_{-1} \times$ Vote Margin t_{-1}	0.398*** (0.0657)	0.628*** (0.0327)
Dem. Win $t_{-1} \times$		
\times Year -6 or earlier	0.00948 (0.0249)	-0.00740* (0.0107)
\times Year -5	0.00638 (0.0280)	0.00591 (0.0164)
\times Year -4	-0.0249 (0.0330)	0.0179 (0.0204)
\times Year -3	0.0364 (0.0543)	0.00989 (0.0161)
\times Year -2	-0.00444 (0.0303)	-0.00925 (0.0147)
\times Year 0	-0.0761*** (0.0262)	-0.0501*** (0.0147)
\times Year 1	-0.0888*** (0.0272)	-0.0544*** (0.0204)
Observations	1,636	14,350
R-squared	0.519	0.395
Number of Clusters	405	3,182
Year FE	Yes	Yes

Notes: The table presents the results of the event study regression. The unit of observation is for column 1 is a congressional district whereas for column 2 is a state legislative district. The sample is comprised of district that obtained mobile internet coverage in 2008, with a total of 1,636 congressional and 14,350 state legislative district from the initial sample. The regression includes lags and leads of the year of the event as well as year fixed effects. Standard errors are clustered at the district level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$