How Electoral Institutions Affect Political Accountability: Evidence from All-Mail Elections*

James Szewczyk
Department of Political Science
Emory University
james.szewczyk@emory.edu

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Abstract

A central question in the study of democratic governance concerns the conditions under which voters make informed choices at the ballot box. I exploit the staggered implementation of an electoral reform in a U.S. state to study the effects of electoral institutions on voter information and political accountability. I find that all-mail elections cause an increase in turnout in municipal elections and a decrease in ballot roll-off on statewide ballot measures in presidential election years in some counties, which is largely consistent with my argument that voters gather more information about politics when voting by mail. Further, there is strong evidence that vote-by-mail results in a decrease in taxing and spending in municipalities. The institution has less conclusive effects on municipal accountability audit outcomes. Using data from the Catalist voter file I show that these results cannot be explained by changes in the composition of the electorate caused by vote-by-mail.

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An enduring problem of democracy is determining how to overcome the informational asymmetries between elected officials and the public in order to ensure that policy makers are faithful agents of the electorate. Indeed, voters often do not have sufficient knowledge to make informed choices while voting because relevant political information is simply unavailable or citizens choose not to seek it out. The task that voters are faced with is especially difficult in democracies where there are many layers of government and, consequently, many incumbents that voters must evaluate in any given election. This lack of political knowledge among voters can result in the electorate selecting incompetent politicians or ineffectively monitoring incumbents, which causes a breakdown in the accountability-inducing mechanism of elections. However, a large literature on formal models of elections suggests that institutions that increase voters' access to political information can result in politicians working harder for and more in line with the interests of their constituents (e.g. Ashworth 2012, Besley 2006).

I propose that electoral institutions shape how voters gather information about politics and evaluate incumbents, which affects the behavior of elected officials. Particularly, I argue that all-mail elections[1] result in voters obtaining more information about politics than they do when voting in a traditional polling place. A voter is able to gain relevant political information if he is voting in an all-mail election, because when filling out his ballot he has the ability and time to learn more about the races that he knew nothing or little about before receiving his ballot. However, if an individual comes across a race in which he knows nothing about the candidates when voting at a polling place, he is unable to obtain additional information before casting his vote. Increases in information among voters strengthens the electorate's ability to hold politicians accountable through elections.

I trace out the effects of vote-by-mail on voter behavior, elected official behavior, and policy outcomes by exploiting the staggered implementation of the institution in an American state. This

[1]In this paper, I use the terms vote-by-mail and all-mail elections interchangeably to refer to an election where ballots are delivered to all voters by mail, which is also known as postal ballot delivery. In Washington, voters can return their ballots via special dropboxes or U.S. mail.

allows me to use a difference-in-difference design to credibly estimate the effects of vote-by-mail on a variety of outcomes. Specifically, leveraging a law passed in the state of Washington that allowed individual counties to decide if and when they wanted to switch to all-mail elections, I find evidence that vote-by-mail affects the strategic interaction between voters and politicians that takes place through elections.

With respect to voters, I first show that switching to vote-by-mail causes an increase in turnout for municipal office that is larger than the increase in aggregate turnout caused by vote-by-mail. I also find mixed evidence that switching to vote-by-mail results in a decrease in ballot roll-off for statewide ballot measures in presidential election years. This effect is only present in a subset of Washington's counties. Nevertheless, these findings are largely consistent with the logic that vote-by-mail causes a change in voter behavior that results in voters seeking out additional political information. I then examine how vote-by-mail affects the behavior of politicians and policy outcomes in Washington's municipalities. I first examine how vote-by-mail affects the average number of violations documented in accountability audits completed by the state government. I find that there is a decrease in this quantity after switching to vote-by-mail, but this result does not hold across all years that municipalities switched to vote-by-mail. Further, consistent with models of political economy (Persson and Tabellini 2000) and previous work that suggests voters punish incumbents for high levels of spending (Besley and Case 1995*b*), I also find strong evidence that switching to vote-by-mail results in a decrease in revenue, especially from property taxes, and a decrease in total expenditures in municipalities in Washington. These results are conditioned by the presence of a mayor-council form of government and the competitiveness of elections. Finally, using data from Catalist on the demographic characteristics of voters I show that these results cannot be explained by changes in the composition of the electorate caused by vote-by-mail.

The findings that I present in this paper have implications for our understanding of responsiveness in local governments as well as the consequences of electoral institutions more broadly. As Trounstine (2010) notes, there is a lack of research on responsiveness and accountability at the local level. Thus, this paper builds on more recent work that demonstrates how fiscal policy outcomes

in cities are affected by the ideology of citizens (e.g. Einstein and Kogan 2016, Tausanovitch and Warshaw 2014) by showing how electoral institutions also shape these policies. Further, although there is a large literature on the effects of vote-by-mail in the United States (e.g., Bergman and Yates 2011, Berinsky, Burns and Traugott 2001, Gerber, Huber and Hill 2013, Kousser and Mullin 2007, Magleby 1987, Richey 2008), it focuses almost exclusively on how the institution affects voter turnout. Therefore, I expand our understanding of vote-by-mail in at least two ways. First, I propose a new theory of how the institution affects the behavior of voter: vote-by-mail leads voters to gather more information about elected officials. Second, I move beyond previous work on vote-by-mail by examining how these changes in voter behavior shape the behavior of elected officials and affect policy outcomes. Electoral institutions such as election timing (Anzia 2011), ballot technology (Fujiwara 2015), and compulsory voting (Bechtel, Hangartner and Schmid 2016, Fowler 2013) have been shown to affect the policymaking process. This paper, thus, demonstrates that an electoral institution that has been given little attention in the literature on the policy consequences of electoral reforms has profound effects on electoral accountability and public policy.

How Vote-by-Mail Affects and Voter Knowledge

The central theoretical argument in this paper is that holding elections by mail causes a change in voter behavior that gives voters the ability to gather more information about politics than they would when voting at a polling place. The mechanism that increases the probability that voters who cast their ballots in all-mail elections will obtain information about elected officials is simple: voters have the ability and time to gather more information about candidates and races for which they would otherwise have little or no information when they participate via vote-by-mail rather than at a polling place. In this section, I expand on this intuition and discuss how voters in Washington changed their behavior after the switch to vote-by-mail.

Due to the large number of elected offices and multiple layers of governments in the United States, there are many officials that voters are tasked with holding accountable through elections

(Berry and Gersen 2009). However, when casting a ballot most citizens do not have sufficient information or interest in a particular office to evaluate all of these elected officials. That is, there are typically many races on the ballot in a given election for which voters have little information about the candidates running for office or the performance of the incumbent if he is running for reelection. Moreover, when casting a ballot at a polling place if an individual comes across a race that he has very little information on or knows nothing about, he has no time or ability to obtain additional information about these races.

However, when elections in which all voters are mailed a ballot are held, the process of voting is much different. Voters receive their ballots multiple weeks before an election and are able to examine the ballot for an extended period of time before deciding how to vote. Thus, voters have the ability to gather information about the candidates running for office and relevant policy issues. This informational effect will be particularly large for the numerous races for local office that are not very salient. Anecdotal evidence suggests that individuals do indeed seek out political information while filling out their ballot when they participate in a vote-by-mail election. For example, one voter in Washington said, "When I voted at the polls, I would not read up as much. Now that I have the absentee, I have the time to really read things" (Reed 2007). This quote illustrates that voters who otherwise would not look up information about a particular low-salience race on the ballot when voting in a polling place do choose to do so when they have more time with their ballot when voting by mail.

Further, others have argued that all-mail elections add a new social aspect to voting that results in discussion about politics, which will also increase levels of voter knowledge (Eveland 2004). For example, an opinion piece in the newspaper *The Columbian* observes that under vote-by-mail, "Many voters enjoy gathering with children to share the research, deliberation and voting experiences" (*In Our View: A Good Way to Vote* 2010). Thus, not only are voters taking more time to conduct research about politics under a vote-by-mail system but they are also building additional discussion about the issues into their voting experience. This should also result in vote-by-mail voters learning more about the candidates running for office.

Whether they are researching on their own or discussing the election with family, there are a number of tools that voters can use to gather information about candidates or ballot measures when they are voting in their home. For example, voters have a great deal of information available to them through newspaper coverage and the Internet. Importantly, all households in the state of Washington are also mailed a Voters' Pamphlet that contains biographical information about the candidates running for office and detailed descriptions of ballot measures. At a minimum, this source of information can help voters select more experienced and competent candidates based on their background and previous experiences that are outlined in the pamphlet. In sum, the core argument of this paper is that when voting in an all-mail election voters have access to information about the election while voting and naturally have the time to conduct additional research about candidates on the ballot. Consequently, under a vote-by-mail electoral system voters will be more informed, on average, than they would be when voting in a traditional polling place systems.

Political Information and Electoral Accountability

For the effects of vote-by-mail on voter behavior to also affect the behavior and incentives of politicians, they must be aware of the changes in voter behavior that are the result of the reform. In the case of Washington, elected officials, indeed, are aware of the effects that vote-by-mail has on the voting experience and that voters will be more informed than when they voted at a polling place. For example, the Secretary of State in Washington, an elected office, says, "He...believes voters probably make better-informed choices, sitting down at the dining room table with voters' guides, editorials and Web sites available" (*Is Online Voting Next for Washington Voters?* 2006). Incumbent politicians, therefore, understand that when the jurisdiction that they are representing switches to a vote-by-mail electoral system that voters will be gathering more information about their performance in office. The discussion of this by the press in Washington also makes it apparent that the public and elected officials understand the effects of vote-by-mail on voter knowledge.

Because incumbents are aware of this change in voter behavior, vote-by-mail should also induce changes in behavior among elected officials. A rich theoretical literature on political agency models sheds light on the principal-agent relationship between citizens and their elected officials by looking at how the institutional context of elections structures the interactions between voters and politicians (Ashworth 2012). For example, Besley (2006) presents a two-period model where voters evaluate the incumbent based on her performance in office and the incumbent's behavior is conditioned by her anticipation of the voters' decision rule. As in all agency models, the key strategic tension in this model is that elected officials have an informational advantage over citizens about the ideal policy, which creates a number of problems for monitoring incumbents and the selection of competent policy makers. That is, voters are likely to be poorly informed about the optimal policy that should be implemented as the government has more knowledge about the nuances of the policy environment. Moreover, it may also be the case that voters do not observe what policies are implemented and the consequences of those policy choices, which also contributes to this informational asymmetry. When this is the case, elected officials are not necessarily incentivized to work in the best interest of their constituents.

However, changes in voter information levels, like those induced by all-mail elections, should affect the behavior of incumbents and policy outcomes. Indeed, a large class of models suggests that increasing policy relevant information about the incumbent politician increases the responsiveness of elected officials (e.g., Besley 2006). For example, Ashworth (2012) notes, "Most models considered in the literature have similar, and very sharp, predictions for ... informational changes. The voter observes a noisy measure of the incumbent's action. And the likelihood of responsiveness is decreasing in the amount of noise" (191). An institution like vote-by-mail decreases the amount of noise in voters' evaluations of incumbents because it makes it easier for voters to gather political information. Therefore, I expect that vote-by-mail should also cause higher levels of responsiveness among elected officials.

In sum, I argue that vote-by-mail affects the behavior of voters and, as a result, the strategic context of elections. Particularly, holding all-mail elections results in voters gathering more in-

formation about politics and an electorate that is more informed than they would be if they voted at traditional polling places. Based on the theoretical literature on electoral accountability, I posit that this change in voter behavior will affect the ability of the electorate to select competent elected officials and the incentives of incumbent politicians. As a result, vote-by-mail has the potential to cause elected officials to be more competent and responsive to the preferences of voters.

Observable Implications

The most direct hypothesis that can be derived from this theoretical framework is that voters assigned to vote-by-mail will be more informed than voters assigned to polling places. However, due to a lack of suitable survey data in Washington I cannot credibly estimate the effect of vote-by-mail on voter knowledge in this context. However, this theory generates a number of other observable implications for the behavior of voters, politicians, and policy outcomes that I test in this paper.

Voter Behavior. Conditional on a voter casting a ballot, vote-by-mail should result in voters being more likely to vote in lower salience races, because they have more political information. Previous research has found that one of the main contributors to ballot roll-off, the proportion of individuals who cast a ballot in an election but do not vote in a given race, is the low levels of information about certain races (Bullock and Dunn 1996, Wattenberg, McAllister and Salvanto 2000). Relatedly, others have found that processes that increase information about lower salience elections, such as partisan cues (Schaffner, Streb and Wright 2001), decrease ballot roll-off.

I examine two dependent variables to test this hypothesis. I first look at the effects of vote-by-mail on voter turnout in municipal elections and compare it to the average effect of vote-by-mail on turnout. I expect that there will be a larger increase in turnout in municipal elections than in aggregate turnout as a result of vote-by-mail. Ideally, I would examine the relationship between vote-by-mail and ballot roll-off on municipal races, but the total number of ballots cast by individuals residing in a given municipality is not uniformly available over time or across jurisdictions, which is necessary to create the measure of ballot roll-off. Therefore, I also directly estimate the

effects of vote-by-mail on ballot roll-off on statewide ballot measures in presidential election years and expect that the electoral reform will decrease ballot roll-off.

Elected Official Behavior. I examine two different dimensions of the behavior of elected officials. First, if voters obtain more information about incumbents, then elected officials should behave more competently. That is, under vote-by-mail elected officials will avoid misappropriating resources or breaking laws, which hurts their reelection chances, as they anticipate these actions are more likely to be observed. This is consistent with previous work that examines how electoral incentives affect corrupt behavior among politicians (e.g. Ferraz and Finan 2011). Further, even if elected officials are not directly engaging in misconduct themselves, I still expect that if they are managing the government well that there will be fewer violations of protocol among career civil servants. Thus, in political jurisdictions with vote-by-mail elections I predict that there will be more safeguards of public resources and fewer breaches of good governance policies.

I also expect that vote-by-mail will lead to higher levels of responsiveness to the policy preferences of voters. Although individual voters may differ with regard to which policy they think is optimal among a host of different choices, most voters prefer that government services are provided to the public efficiently and at a low cost. Indeed, previous research suggests that voters punish incumbents for high levels of taxing and spending (Besley and Case 1995*b*), and the relevant political agency literature argues that incumbents who exert relatively higher levels of effort will provide services at a lower cost (Persson and Tabellini 2000). Further, empirical evidence indicates that when government officials have to face reelection that taxing and spending decreases (Alt, De Mesquita and Rose 2011, Besley and Case 1995*a*, Sances 2016). This is also consistent with research that finds when voters are faced with ballot measures, and thus policy outputs are more likely to reflect the preference of the median voter, that the level of government spending and tax rates decrease (Matsusaka 2004). Therefore, I hypothesize that vote-by-mail elections will cause politicians to decrease taxing and spending, because they are being more responsive to the preferences of voters.

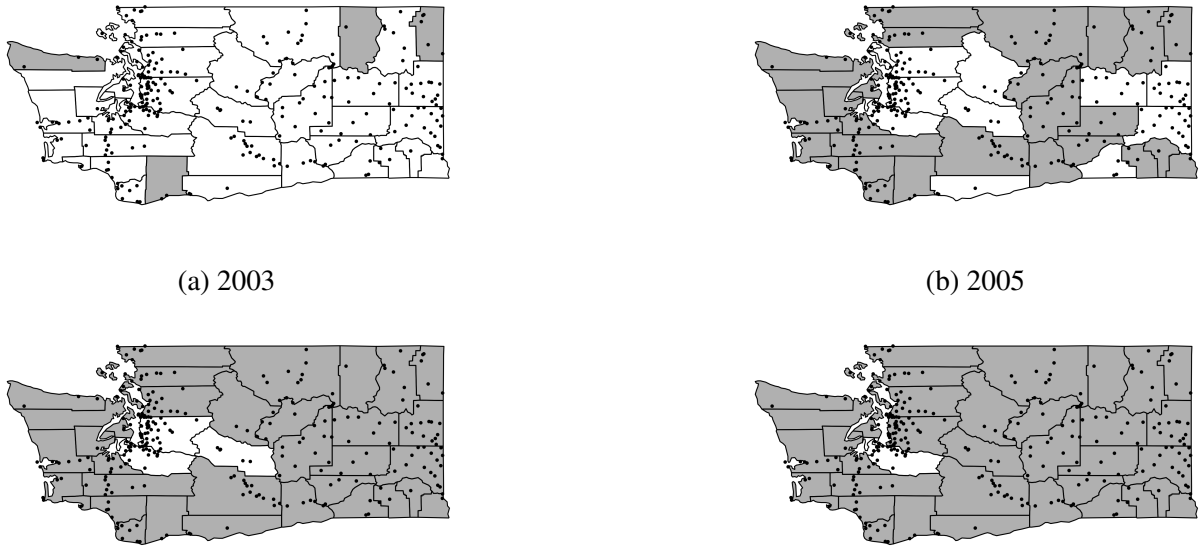
Estimating the Effects of Vote-by-Mail

Identifying the causal effects of an institutional change is often challenging due to the absence of a counterfactual unit that is exactly the same as the one observed except for the absence or presence of the institution of interest. I overcome this issue by leveraging a quasi-natural experiment that is the result of a staggered roll-out of vote-by-mail in Washington state. I now discuss the institutional context of Washington and my research design.

Municipal Elections in Washington

Elections for municipal office in Washington are low-information environments that are held off-cycle in November of odd-numbered years. Although it may be the case that holding local elections off-cycle results in more attention being paid to local politics rather than voters solely focusing on national races, off-cycle elections are typically low-salience and low-turnout contexts (Berry and Gersen 2010, Hajnal and Lewis 2003). Indeed, previous research has shown that local elections are indicative of an electoral environment in which incumbents are not held accountable because voters do not use available political information. For example, Kogan, Lavertu and Peskowitz (2016) find that the implementation of school performance measures in Ohio had little effect on retrospective evaluations of elected school board officials in the state. Thus, the theoretical framework that I have presented is especially applicable for thinking about accountability in local elections as there are relatively low levels of information about elected officials and policy outcomes.

Washington's municipal elections, in particular, lack a number of features that typically send informational signals to voters. Specifically, these local elections are non-partisan and there is no marking of who the incumbent is on the ballot. Party identification serves as a strong heuristic for voters and the absence of this shortcut decreases the informational content of the ballot (Schaffner, Streb and Wright 2001). Moreover, because there is no signal of who the incumbent is on the ballot, voters who have relatively low levels of political information and do not know the name of the incumbent will not be able to perform a simple retrospective evaluation of his performance. There-



(a) 2003 (b) 2005

(c) 2007 (d) 2009

Figure 1: Maps of Washington's counties and municipalities (black dots). Grey shading indicates that a county held vote-by-mail elections in a given year.

fore, an institutional change, like vote-by-mail, that affects how voters' access political information should have a significant effect on electoral accountability in this type of environment.

The Staggered Implementation of Vote-by-Mail in Washington

Most importantly for this study, Washington presents an excellent case for analyzing the effects of vote-by-mail on electoral accountability due to the staggered implementation of the institution in the state. Washington experienced a gradual transition from traditional polling places to vote-by-mail that I exploit in order to estimate the causal effects of vote-by-mail on political behavior and policy outcomes. Starting as early as 1915, Washington allowed for absentee voting using a mail-in ballot, and voters were able to apply to receive their ballot in the mail rather than going to a polling place if they could provide a reason as to why they could not vote on election day (Reed 2007). Further, in 1993 the state passed a law that allowed voters to apply for permanent absentee status (Reed 2007), which allowed voters to receive their ballot in the mail without an excuse.

There were also a number of reforms in Washington that gradually forced citizens to use vote-by-mail, which is the source of treatment in this study, rather than individual voters being able to choose to receive their ballot in the mail. First, in 1967 the state allowed county auditors in the state's 39 counties to assign precincts with fewer than 200 registered voters to hold all-mail elections (Reed 2007). During this time, some rural counties with small populations redrew their precincts so they were small enough to allow the entire county to hold all-mail elections. Second, in 2005 the state legislature passed a law, HB 1754, with a number of electoral reforms including a statute allowing individual counties to decide if they wanted to switch all voters in their jurisdiction to compulsory vote-by-mail, regardless of the size of their precincts. Individual counties, under the direction of their county councils, gradually switched to vote-by-mail elections in the years following HB 1754. Finally, in 2011 only one county had yet to implement all-mail elections, and the state legislature enacted a law forcing the county to implement vote-by-mail.

Figure 1 displays maps that depict the transition to vote-by-mail in select years. The outline of each county is displayed on the map along with black dots representing each municipality in the state. In each panel, grey shading on the map indicates that a particular county held all-mail elections in a given year while the counties shown in white held polling place elections. As can be seen in the maps depicting which counties had vote-mail elections prior to 2005, a total of five counties had sufficiently small precincts to allow vote-by-mail elections for the entire county. After the state allowed individual counties to switch to vote-by-mail in 2005, many counties decided to immediately discontinue polling place elections. Then, almost every year after 2005 more counties switched to vote-by-mail until the state legislature required that all elections in the state were held using vote-by-mail in 2011. In Figure F.1 in the Online Appendix, I also display a figure that gives counts of the number of counties and municipalities that held vote-by-mail elections in each year.

Estimating Equation

In this paper, I exploit the staggered implementation of vote-by-mail in Washington with a difference-in-differences estimation strategy. This design allows me to compare changes in municipalities and

counties where officials were elected using vote-by-mail, the treatment group, to changes in municipalities and counties where officials were elected using a traditional polling place election, the control group. I classify a county and all municipalities within it[2] as being in treatment for all of the years in which the the county held vote-by-mail elections and the control group consists of all other counties and municipalities that have not yet switched to vote-by-mail in a given year. Because counties, and the municipalities nested within them, where the local election officials intentionally redrew precincts to force vote-by-mail elections prior to 2005 may be different than the other counties and municipalities in Washington, I estimate all of my empirical models using the full sample of political units in the state as well as a restricted sample that is only the subset of counties or municipalities that switched to vote-by-mail in 2005 or later. That is, I use this restricted sample of the data because we may be concerned that the outcomes of interest in the counties and municipalities that implemented all-mail elections before 2005 follow different trends than the outcomes in the other counties and municipalities, which would violate the parallel trends assumption that is necessary for a causal interpretation of the difference-in-differences estimator.

In my analyses I estimate models of the following form,

$$Y_{i,t} = \alpha_i + \beta VBM_{i,t} + \lambda d_t + \boldsymbol{\delta}^T \mathbf{X}_{i,t} + \epsilon_{i,t} \tag{1}$$

where $Y_{i,t}$ represents the outcome variables of interest. On the right hand side of the equation, α_i represents either county or municipality fixed effects, depending on the model, to control for time invariant differences between counties or municipalities. To control for year specific shocks I include year specific fixed effects, d_t. $\mathbf{X}_{i,t}$ is a vector of unit specific control variables that vary over time. Finally, $VBM_{i,t}$ is a dummy variable that is equal to 1 after a county or the municipalities within it switch to vote-by-mail and β is the causal effect of interest. Because treatment is applied at the county level, I report robust standard errors clustered by county for the models of this form.

[2]I omit the six municipalities in Washington that cross county borders. I also exclude one municipality, Spokane Valley, that was incorporated during the time period of the analysis.

The Impact of Vote-by-Mail on Voters

My first set of analyses considers the effects of vote-by-mail on the behavior of voters. Recall, I expect that as a consequence of being more informed voters will be more likely to cast a ballot for low salience races when voting by mail. I assess this hypothesis by examining the effects of vote-by-mail on the number of ballots cast in municipal elections and compare it to the estimated average treatment effect of the institution on aggregate turnout in Washington. Then, I directly estimate the effects of vote-by-mail on ballot roll-off on statewide ballot measures in Washington. I now discuss the data used in this set of analyses. Summary statistics of all data used in the paper are displayed in Section A of the Online Appendix.

Data

Election Results. First, I collect the results of city council and mayoral elections for all municipalities in Washington from 2001 to 2011. The results were collected for all odd-year November general elections from individual county election offices. I use this data along with estimates of the Citizen Voting Age Population (CVAP) from the American Community Survey to create the variable $\textit{MunicipalTurnout}_{m,t}$. This variable is created by taking the total number of ballots cast for the race in each municipality in a given year that received the most votes and dividing it by the CVAP. Because voters may choose to vote for only a subset of municipal races, this variable is a lower bound on the total number of people who cast a ballot for a municipal race. Using this data I also create a dummy variable indicating if there is a $\textit{MayorElection}_{m,t}$.

Second, I gather the results of all statewide ballot measures in Washington from 2000 to 2010 broken down by county from the Washington Secretary of State's website and individual county election offices. I obtain county-level voter turnout from the Gerber, Huber and Hill (2013) replication file. The variable $\textit{BallotRollOff}_{c,t}$ is created, first, by dividing the number of individuals in a county who voted for a given ballot measure by the total number of ballots cast in that county. Then, this quantity is subtracted from 1 and multiplied by 100. The variable ranges from 0 to 100

with 100 indicating that no voters cast a ballot for a given ballot measure and 0 indicating that there was no ballot roll-off. In addition, I control for the prevalence of absentee ballot usage in counties prior to the switch to all-mail elections with the variable $LaggedAbsentee_{c,t}$.[3] Following Gerber, Huber and Hill (2013), this variable is the average of the percentage of votes cast absentee in the previous two elections of the same type.

Vote-By-Mail. The main independent variable of interest in my analyses, $VBM_{i,t}$, is created using information from the Washington Secretary of State's Office about when each county switched to vote-by-mail. It is a dummy variable equal 1 in all years when a county or municipality holds all-mail elections and 0 otherwise.

United States Census. I control for the demographic characteristics of Washington's counties and municipalities using data from the 2000 Decennial U.S. Census and the 2009 and 2010 American Community Survey's 3 Year Estimates. I linearly interpolate the Census data for each missing year of the panel (2001 - 2008). Particularly, I control for total population as well as the distribution of racial characteristics, educational attainment, age, income, and rural residents in each jurisdiction.

Voter Behavior Results

I first examine the effects of vote-by-mail on voter turnout in Washington's municipal elections. Figure 2 displays turnout among the treated group of municipalities that switched to vote-by-mail in 2005 and a control group of municipalities that switched to vote-by-mail after 2005.[4] Encouragingly, the figure shows that prior to the switch to vote-by-mail in 2005 treated and control municipalities have similar levels of turnout and changes in turnout from 2001 to 2003. In 2005 there is a large jump in turnout among both groups of municipalities, but this increase is much

[3]I do not account for prior absentee usage for my analyses a the municipality level, because this data is not available for municipalities.

[4]Municipalities are omitted from the control group for this figure for the years after they switch to vote-by-mail.

larger among vote-by-mail municipalities. This suggests that vote-by-mail causes an increase in municipal turnout among municipalities that switched to all-mail elections in 2005.

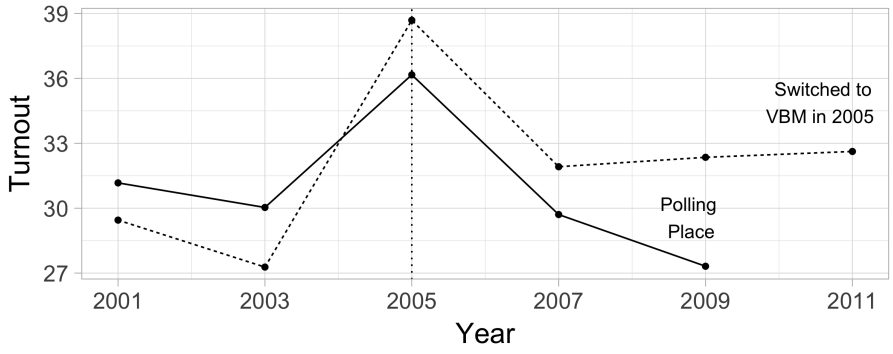


Figure 2: Municipal turnout over time among municipalities that switched to vote-by-mail in 2005 and polling place municipalities.

In Table 1, I quantify the size of this effect by estimating models in the form of Equation 1 with municipal turnout as the dependent variable.[5] All of the models include municipality and year fixed effects and the models in Columns 2 and 4 include a set of demographic and municipal race specific control variables. I control for a variety of municipality-level demographic characteristics and whether or not there is a mayoral race on the ballot, because that could also potentially cause increases in turnout. The results indicate that vote-by-mail causes a 4.3% to 4.7% increase in turnout in Washington's municipal elections. This effect is substantially larger than what Gerber, Huber and Hill (2013) estimate using turnout at the county level as the dependent variable. Specifically, Gerber, Huber and Hill (2013) find that vote-by-mail causes a 2.6% to 3.3% increase in voter turnout (p. 98, Table 3). The larger magnitude of the effect of vote-by-mail on turnout in municipal elections is consistent with my hypothesis that voters will be more likely to vote in lower salience elections when casting their ballot after the switch to vote-by-mail.

I corroborate this interpretation of these results by estimating the effects of vote-by-mail on ballot roll-off on statewide ballot measures in presidential election years. I restrict my attention to presidential elections, because statewide ballot measures can be highly salient issues that drive turnout in midterm and odd-year elections (Nicholson 2003). That is, I do not expect that vote-

[5]I present robustness checks of the voter behavior results in Section D of the Online Appendix.

Table 1: The Effects of Vote-by-Mail on Municipal Turnout

	Dependent variable:			
	Turnout			
	Full Sample		Restricted Sample	
	(1)	(2)	(3)	(4)
Vote-by-Mail	4.367***	4.453***	4.706***	4.709***
	(0.604)	(0.508)	(0.615)	(0.542)
Munic-Year FE	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
Observations	1,685	1,685	1,547	1,547
Adjusted R^2	0.662	0.695	0.670	0.704

Note: Robust standard errors clustered by county in parentheses. *p<0.1; **p<0.05; ***p<0.01. Control variables include an indicator for if there was a mayoral race as well as the following demographic controls: percent Black, percent Latino, median income, percent with high school degree or higher, percent urban and total population.

by-mail will have a large impact on ballot roll-off in these non-presidential elections in which statewide ballot measures are some of the most high profile races. In addition to analyses where I directly estimate the effects of switching to vote-by-mail on ballot roll-off, I estimate models where I control for the percentage of voters who cast their ballots with a mail-in absentee ballot. This is because some Washingtonians used permanent absentee ballots prior to the switch to vote-by-mail and, therefore, would not be treated with the switch to all-mail elections. I also interact the lagged absentee variable with the vote-by-mail election indicator. This allows me to estimate a quantity similar to the treatment effect on the treated by exploiting variation in the size of the population that was actually treated with the switch to vote-by-mail because they did not previously use mail-in absentee ballots.

The results of the models with ballot roll-off as the dependent variable are displayed in Table 2 and provide mixed support the hypothesis that vote-by-mail decreases ballot roll-off. Columns 1-3 include the full sample of counties and Columns 4-6 include the restricted sample of counties. Examining the results with the full sample of counties, the coefficient on the vote-by-mail indicator is in the expected direction but it never achieves statistical significance. After excluding the counties from the sample that switched to vote-by-mail prior to 2005, the estimated effect of

vote-by-mail is substantively larger and statistically significant in all of the specifications of the model. In the regression that includes a variable controlling for the average percentage of voters that used absentee ballots in the previous two elections (Column 5), I estimate that vote-by-mail decreases ballot roll-off by 2.126%. Further, the marginal effect of vote-by-mail on ballot roll-off among voters who did not use absentee ballots (Column 6) is a substantively larger 3.876%. This indicates that the effect of all-mail elections on ballot roll-off is largest in counties that had the least amount of mail-in ballot usage prior to the reform.

Table 2: The Effects of Vote-by-Mail on Ballot Roll-Off

	Dependent variable:					
	Ballot Roll-Off					
	Full Data			Restricted Data		
	(1)	(2)	(3)	(4)	(5)	(6)
Vote-by-Mail	−0.429	−0.554	−0.710	−1.983*	−2.126**	−3.876**
	(0.513)	(0.569)	(1.169)	(1.080)	(0.985)	(1.593)
Lagged Absentee		−0.007			0.040	
		(0.028)			(0.029)	
Vote-by-Mail*Lagged Absentee			0.004			0.031
			(0.021)			(0.020)
County-Yr FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	502	502	502	437	437	437
Adjusted R^2	0.364	0.618	0.618	0.633	0.636	0.637

Note: Robust standard errors clustered by county in parentheses. *p<0.1; **p<0.05; ***p<0.01. Control variables include indicators for ballot measure type as well as the following demographic controls: percent Black, percent Latino, median income, percent with high school degree or higher, percent urban and total population.

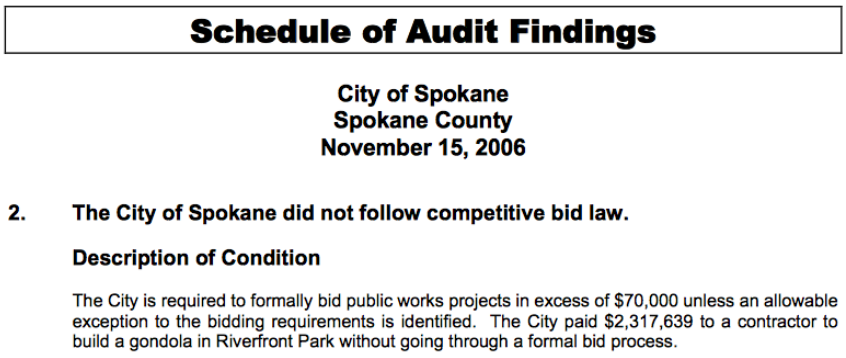
Although the findings regarding ballot roll-off are only robust to the inclusion of counties that switched to vote-by-mail in 2005 or later, this set of results regarding voter behavior provides some tentative evidence in support of the theory presented in this paper. After switching to vote-by-mail, turnout in municipal elections increases at a higher rate than aggregate turnout and ballot roll-off on statewide ballot measures decreases in at least some counties. I argue that these effects are the result of voters gathering more information about politics when voting by mail.

The Impact of Vote-by-Mail on Elected Officials

I now turn to an analysis of how vote-by-mail affects the behavior of politicians and policy outcomes in Washington's municipalities. As discussed, if vote-by-mail leads voters to gather more information about those running for office this should induce elected officials to also change their behavior. Specifically, I analyze the effects of vote-by-mail on the likelihood that municipal governments receive negative accountability audit findings and on taxing and spending in municipalities. I now turn to a discussion of the data used in these analyses before presenting the results.

Data

Audit Reports. First, I gather information from audit reports that the Washington State Auditor's Office releases for every governmental entity in the state. Municipalities are regularly subject to "accountability audits" and "financial audits" that are completed by representatives of the State Auditor's Office. Accountability audits are intended to ensure that municipalities are safeguarding public resources and following necessary policies and laws in day-to-day governance, while financial audits assess whether or not a municipality's financial statements are being completed accurately. Accountability audits are completed at least once every three years in each municipality and financial audits are done yearly for municipalities that have revenues that exceed a specified threshold. After an audit is completed, the auditor summarizes any bad behavior in the municipality by noting if there are any "findings." Each finding explicitly states a specific breach of law or protocol by a municipal official and if a municipality has zero findings for a given audit period this indicates that no violations were found. These reports include the misconduct of both career government employees as well as elected officials. But, elected officials, either the mayor or a city manager that is directly accountable to the city council, are in charge of managing the government so I expect that a shock, such as vote-by-mail, that induces elected officials to act more responsibly will affect the outcomes of these audits. Figure 3 displays an example of an activity for which a municipality could receive a finding.



Schedule of Audit Findings

City of Spokane
Spokane County
November 15, 2006

2. The City of Spokane did not follow competitive bid law.

Description of Condition

The City is required to formally bid public works projects in excess of $70,000 unless an allowable exception to the bidding requirements is identified. The City paid $2,317,639 to a contractor to build a gondola in Riverfront Park without going through a formal bid process.

Figure 3: Example of an audit finding in a municipality in Washington.

I obtain the audit reports from the Washington State Auditor's website where a PDF of each report from January 2005 to present is publicly available. The audit periods covered in my data, however, begin prior to 2005 because the audit reports are typically released a few years after the time period that is being audited. The type of audit, the exact time period for which the government's activities were being audited, and the number of "findings" that the auditor discovers are all scraped from the reports. This information is used to create the dependent variable, $AvgFindings_{m,t}$, which is the average number of findings for a municipality in a given time period. Higher values of this variable indicate that more laws and regulations were broken or public resources were misappropriated over a particular time period by the municipality.

Municipal Revenue and Expenditures. To test my hypotheses about the effects of vote-by-mail on municipal revenue and expenditures, I collect data from the Washington State Auditor's Office on the finances of Washington's municipalities from 2001 to 2010.[6] The Auditor's Office systematically collects detailed revenue and expenditure data from each municipality in the state at the end of every calendar year and the law requires that each municipality report their finances. I use this information to compile a panel dataset of the taxing and spending behavior of municipalities. First, I create variables measuring the total revenue and the sources of this revenue in Washing-

[6]This data was obtained from the following website in October of 2016: http://portal.sao.wa.gov/LGCS/Reports/ViewExportedData.aspx. The variables that were constructed from this data were generated after correspondence with the State Auditor's Office.

ton's municipalities. Specifically, I generate the following variables: *LogRevenuePerCapita*$_{m,t}$, *LogTaxRevenuePerCapita*$_{m,t}$, and *LogPropertyTaxRevenuePerCapita*$_{m,t}$. These are measures in each year from 2001-2010 of each municipality's total revenue as well as total tax revenue and, specifically, property tax revenue. Second, I create a dependent variable measuring total spending municipalities, *LogExpendituresPerCapita*$_{m,t}$. All of these variables are generated by taking the total amount of money in a given category and then normalizing the amount to 2001 real dollars using the consumer price index. Then, I divide the totals by the population in the municipality and log this value in order to adjust for skew in the data.

Accountability Audits Results

I first examine how vote-by-mail affects the quality of elected officials and the governments that they are tasked with overseeing using the audit report data. Specifically, I expect that in municipalities with vote-by-mail elections that elected officials will be less likely to break laws or misappropriate public resources. The audit report data presents a number of challenges because audits do not take place at universal intervals across all municipalities and there are sometimes multiple types of audits happening simultaneously in a given municipality. For example, the period of time that the auditor is examining can range from 1 year to 4 years and a municipality could have its financial records audited while, say, a three year accountability audit is also taking place. This presents a problem because the data are not in the standard panel format where each observation would be a municipality-year. Thus, I cannot use the same approach as in the previous section where I adapt the difference-in-differences framework over multiple periods to a single regression in the form of Equation 1.

Therefore, in order to examine the effects of vote-by-mail on the average number of findings that a municipality receives in a given year, I calculate non-parametric difference-in-differences estimates that compare changes in treated municipalities after a switch to vote-by-mail to changes in those municipalities which have not yet been treated. Specifically, I calculate the sample analogs of the population quantities in the following equation:

$$\hat{\beta} = \big(E[\textit{AvgFindings}_{m,t} \mid m = \textit{Treated}, t = 1] - E[\textit{AvgFindings}_{m,t} | m = \textit{Treated}, t = 0]\big) - \big(E[\textit{AvgFindings}_{m,t} | m = \textit{Control}, t = 1] - E[\textit{AvgFindings}_{m,t} | m = \textit{Control}, t = 0]\big) \quad (2)$$

In this framework, $t = 0$ indicates the time period before a switch to vote-by-mail and $t = 1$ indicates the time period after a switch to vote-by-mail. The municipalities in the group $m =$ *Treated* are those that switched to vote-by-mail in a given year and the municipalities in the group $m =$ *Control* are the municipalities that have not yet been treated and are not treated in the year in which the effect is being estimated. As a results of this setup, as we move away from the year in which most counties decided to switch to vote-by-mail (2005) the number of counties left to be treated or to be a part of the control group drops dramatically. In fact, after 2006 there are only 5 counties that have not yet been treated with vote-by-mail and, as a result, there are an insufficient number of clusters for valid inference (Cameron, Gelbach and Miller 2008).

Therefore, I restrict my analysis of this data to the municipalities that switched to vote-by-mail in 2005 and 2006. First, I calculate the sample averages and estimate Equation 2 by using data on audit reports that began and ended in the year prior to vote-by-mail ($t = 0$) and began and ended by the year after the switch to vote-by-mail ($t = 1$). For example, for the municipalities that switched in 2005, I compare the average number of findings for reports that took place in 2004 to those that took place in 2006. Then, I estimate the same model but expand this bandwidth to include reports that began and ended within two years of the switch to vote-by-mail. I only include municipalities in my sample that have audit reports in both the time periods before and after treatment to account for the fact that some municipalities may not be audited every year. The standard error of the difference-in-differences estimates is calculated as the standard deviation of 500 block bootstraps with each county being its own cluster. This is then used to construct 95% confidence intervals around the estimates.

The quantities estimated from Equation 2 are displayed in Figure 4 with 95% confidence intervals for municipalities that switched to vote-by-mail in 2005 and those that switched in 2006.[7] The estimated effect of vote-by-mail on the average number of audit findings using a bandwidth of one year around the switch to vote-by-mail is shown with the solid line and the estimates using a bandwidth of two years around the switch is shown with the dashed line. For 2005, the difference-in-differences estimates are in the expected direction but are not statistically significant. However, for the municipalities that switched in 2006 the point estimates are negative and statistically distinguishable from 0 for both the one year (-0.261) and two year (-0.129) bandwidths. This indicates that among the municipalities that switched to vote-by-mail in 2006 that the institution caused a decrease in the average number of findings on accountability audit reports.

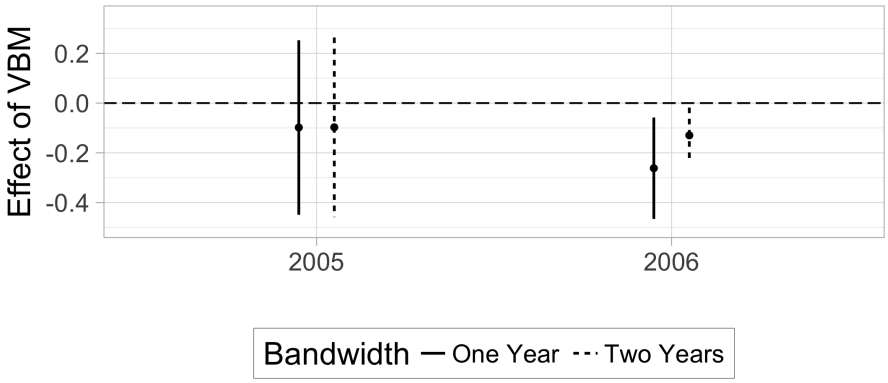


Figure 4: The effects of vote-by-mail on the average number of municipal audit findings. One-year and two-year bandwidth estimates are displayed with county-level block-bootstrap 95 % confidence intervals.

These results provide suggestive evidence that in the years directly after the switch to vote-by-mail that the institution had a negative effect on the number of findings documented in audit reports among municipalities that switched to vote-by-mail in 2006. Audit report findings in Washington represent a substantial breach of law, so it is perhaps not very surprising that the effects are substantively quite small and isolated to municipalities that switched to vote-by-mail later. That is, it may

[7]In Figure B.1 in the Online Appendix, I present a series of placebo tests that show there are no pretreatment differences between treatment and control groups.

be the case that the types of issues that are documented in audit reports are difficult for politicians to fix in a relatively short time period after they expect that voters will obtain more information about their performance. In sum, this set of analyses provides tentative support for the theory that elected officials strategically respond to the expectation that voters will gather more information about incumbents when voting in an all-mail election. Further, these results cannot be explained by any potential changes in the composition of the electorate that are a result of vote-by-mail. That being said, this set of analyses has its drawbacks because I am only able to examine the effects of vote-by-mail in a small subset of municipalities in the state of Washington, and the results are not very robust.

Municipal Fiscal Policy Results

I now estimate the effects of vote-by-mail on municipal revenue and expenditures. Recall that under the assumption that voters are fiscal conservatives, I expect when a political jurisdiction switches to vote-by-mail that taxing and spending will decrease. Table 3 displays the results of models in the form of Equation 1 with the four municipal finance dependent variables.[8] The top panel displays the effects of vote-by-mail on log total revenue per capita (Columns 1-4) and log total expenditures per capita (Columns 5-8) across a variety of specifications. Across all of the models there is a consistent theme: when a municipality switches to vote-by-mail, total revenue and expenditures decrease. The results maintain standard levels of statistical significance for both the full and restricted sample as well as with or without the set of control variables. For example, in the model with the full sample of municipalities and controls for demographic characteristics, switching to vote-by-mail leads to a statistically significant 0.059 decrease in log revenue per capita (Top Panel, Column 2). Taking into account the log transformation of the dependent variable, this is equivalent to a 5.9% decrease in total revenue per capita. In the analogous model with

[8]In Sections C.1 and C.2 of the Online Appendix, I show that these results are largely robust to the inclusion of municipality specific time trends at that there are not significant pre-treatment differences between treatment and control units.

the log expenditures per capita dependent variable the coefficient on the vote-by-mail variable is statistically significant and equal to -0.071 (Top Panel, Column 6), which indicates that vote-by-mail elections cause a 7.1% decrease in total expenditures per capita. This provides strong evidence that vote-by-mail causes elected officials to implement more conservative fiscal policies Washington's municipalities.

I next turn to a discussion of the effects of vote-by-mail on revenue obtained from taxes. If elected officials are responding to the electoral incentives created by vote-by-mail or voters are doing a better job of selected good types after the institution is implemented, then we should expect that there is a decrease in revenue obtained from sources, like property taxes, that particularly impact the pocketbooks of voters. Although one may expect that changes in property tax rates will be obvious to voters regardless of how informed they are because it is easy for voters to observe how much they have to pay each year, property taxes in the state of Washington are some of the most complicated in the country. Annual property tax levy rates in Washington are capped at $10 for every $1,000 in property value. For every $10, municipalities are typically able to have a levy rate up to $3.375. Each year municipalities determine the total property tax levy, or the amount of revenue that the jurisdiction needs to acquire from property taxes, and the levy rate for each property owner is determined based on that amount and the assessed property values in the municipality. In addition to the previously described constraints, the increase in the levy from the previous year cannot exceed 1% and a municipality's levy can be decreased depending on the levies of other taxing districts. In sum, the determination of property taxes in Washington is incredibly complex and it is challenging for uninformed voters to assign credit or blame for changes in property tax rates without seeking out additional information.

The results of the models with the tax dependent variables are displayed in the bottom panel Table 3. Columns 1-4 of the bottom panel display the effect of vote-by-mail on log total tax revenue per capita. Although, the sign of the coefficient on the vote-by-mail variable is negative across the different specifications of the model it is never statistically significant. However, Columns 5-8, which display the models with log property tax revenue per capita as the dependent variable,

indicate that the decrease in total revenue documented seems to be largely driven by a decrease in property taxes. Depending on the specification of the model the results show that vote-by-mail caused a 3.6% (Bottom Panel, Column 6) to 4.0% (Bottom Panel, Column 7) decrease in revenue from property taxes in Washington's municipalities. Thus, not only does vote-by-mail cause lower levels of revenue and expenditures, but these decreases in total revenue are driven by a decrease in property taxes, which is a revenue source that is most likely to directly effect many voters.

Table 3: The Effects of Vote-by-Mail on Municipal Revenue and Expenditures

	Dependent variable:							
	Log Revenue Per Capita				Log Expenditures Per Capita			
	Full Sample		Restricted Sample		Full Sample		Restricted Sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Vote-by-Mail	-0.051^{*}	-0.059^{*}	-0.055^{**}	-0.066^{**}	-0.064^{**}	-0.071^{**}	-0.071^{***}	-0.080^{***}
	(0.029)	(0.031)	(0.026)	(0.028)	(0.026)	(0.030)	(0.022)	(0.025)
Observations	2,596	2,596	2,385	2,385	2,596	2,596	2,385	2,385
Adjusted R^2	0.703	0.707	0.706	0.709	0.695	0.700	0.697	0.701
	Dependent variable:							
	Total Tax Revenue				Property Tax Revenue			
	Full Sample		Restricted Sample		Full Sample		Restricted Sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Vote-by-Mail	-0.019	-0.023	-0.020	-0.025	-0.038^{***}	-0.036^{***}	-0.040^{***}	-0.037^{***}
	(0.014)	(0.015)	(0.014)	(0.016)	(0.010)	(0.009)	(0.011)	(0.010)
Observations	2,596	2,596	2,385	2,385	2,595	2,595	2,384	2,384
Adjusted R^2	0.957	0.958	0.956	0.957	0.934	0.936	0.932	0.933
Munic-Yr FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes

Note: Robust standard errors clustered by county in parentheses. *p<0.1; **p<0.05; ***p<0.01. Control variables include the following demographic controls: percent Black, percent Latino, median income, percent with high school degree or higher, percent urban and total population.

I now turn to a discussion of the substantive magnitude of these effects. In the average municipality the property tax revenue per capita is $203.82 and vote-by-mail causes a $7.26 decrease in property tax revenue per capita. This appears to be a somewhat small effect but the property tax burden is not distributed evenly across the population so some voters may see substantial decreases in their property tax payments while voters who do not own a home will not be effected by this change. Further, the effect of vote-by-mail on expenditures is substantively larger. In particular, in

the average municipality there is a $141.99 decrease in expenditures per capita after the switch to vote-by-mail.

In sum, the results that I have presented so far in this paper document a series of effects that vote-by-mail has on the behavior of voters, elected officials, and policy outcomes. First, vote-by-mail causes a substantial increase in turnout in municipal elections, and a decrease in ballot roll-off on statewide ballot measures among counties that implemented the electoral reform in 2005 or later. All-mail elections also result in a decrease in negative findings on accountability reports for the set of municipalities that switched to vote-by-mail in 2006. Finally, the institution causes a substantively significant decrease in revenue and expenditures in Washington's municipalities. This final set of results holds across a wide variety of specifications of the regression models. In all, although some results presented thus far in this paper are more robust than others, the findings are largely consistent with the theory that vote-by-mail causes voters to become more informed and that politicians respond to this change in behavior by behaving more in line with the interests of voters.

Additional Municipal Fiscal Policy Results

In Section C.3 of the Online Appendix, I present an additional set of analyses that are informed by the theory to further interrogate the findings regarding municipal finances. First, I analyze how municipal finance outcomes vary across cities with mayor-council governments compared to those with council-manager governments. Scholars generally argue that in cities with strong mayors that policies better reflect the preferences of citizens (Sharp 1997, but see Tausanovitch and Warshaw 2014), so I expect that mayor-council governments will be more responsive to the switch to vote-by-mail. Indeed, in Table C.7 I show that the effects of vote-by-mail on the municipal finance outcomes of interest are driven by municipalities that have an elected mayor. Second, I expect that electoral competition will magnify the effects of vote-by-mail, because incumbents who believe that they will face strong challengers will be more likely to be responsive to changes in electoral systems and their constituents. To test this, I display models in Table C.7 where I interact a measure

of electoral competitiveness with the vote-by-mail indicator and find that the effects of vote-by-mail on all of the dependent variables other than log property tax revenue per capita become larger as competitiveness increases.

Finally, a potential concern is that the vote-by-mail variable is capturing changes in taxing and spending determined in the year before the switch to the institution, which would indicate that is not actually all-mail elections causing these changes in municipal finances. I address this concern by estimating models with with a series of lags of the vote-by-mail variable in Table C.8. I find that across all of the dependent variables the effects of vote-by-mail appear to begin in the year after municipalities switch to the institution. In all, the fact that these additional hypotheses that are derived from my theory hold provides additional evidence that the municipal revenue and expenditures results documented in this paper are indeed the result of switching to vote-by-mail and are not false-positives.

Alternative Explanation: Composition of the Electorate

I have argued in this paper that the municipal fiscal policy consequences of vote-by-mail are the result of the informational effects of the institution. However, a potential alternative explanation for these results is that vote-by-mail changes the composition of the electorate and elected officials are responding to the change in who votes after switching to vote-by-mail. Specifically, there are two potential effects of vote-by-mail on the composition of the electorate. First, vote-by-mail may decrease the socioeconomic bias in the electorate, because mailing a ballot to potential voters substantially decreases the costs of voting. On the other hand, vote-by-mail could increase the socioeconomic bias in the electorate by increasing the political power of homeowners and those with more permanent living situations. If this latter hypothesis is true then it could explain the effects of vote-by-mail on municipal finances, because homeowners and voters of a higher socioeconomic status are more likely to dislike high levels of taxing and spending. However, if it is not the case that vote-by-mail increases the socioeconomic bias in the electorate, then we can

have more confidence that these findings are the result of voters gathering more information about their elected officials and not changes in the composition of the electorate.[9]

In order to assess this alternative explanation, I examine the effects of vote-by-mail on the composition of the electorate in Washington's municipal elections from 2001 to 2011 using data from the Catalist voter file. Catalist merges voter files with a variety of commercial and Census data using a proprietary matching algorithm (Ansolabehere and Hersh 2012), which allows me to enumerate the number of voters in Washington's municipal elections that have a variety of demographic characteristics. Other research has used this data to measure the composition of the electorate in local elections (Kogan, Lavertu and Peskowitz 2018), but there are a number of potential drawbacks to using Catalist data for this application in particular. Most notably, the data is a cross-sectional extract of the Catalist voter file at the time I downloaded it,[10] which means that registered voters who moved into (out of) a municipality after 2011 will be erroneously included in (excluded from) my measures of the composition of the electorate. This has the potential to introduce measurement error in the dependent variable, which will decrease the precision of the estimated regression coefficients and potentially result in incorrectly accepting the null hypothesis that vote-by-mail does not have an effect on the composition of the electorate. I address this issue by presenting 90% confidence intervals with the point estimates as Rainey (2014) argues that if the values within a 90% confidence interval are substantively small a researcher can argue for a negligible effect.

I estimate models in the form of Equation 1 with theoretically relevant electorate composition variables measuring the homeownership status, income, and age of voters. The results of this analysis with the full sample of the data are displayed in Table 4, while the analysis with the restricted

[9]It is also possible the politicians perceive that there will be a more conservative electorate after the switch to vote-by-mail even if it is not the case, which could also cause the documented effects on municipal finances. I do not expect this to be the case because the popular narrative around vote-by-mail is that it expands access to the ballot.

[10]The data was downloaded in June of 2017.

sample and alternative codings of the dependent variables are consistent with those presented here and are displayed in Section E of the Online Appendix. The results indicate that changes to the composition of the electorate cannot explain the municipal finance findings. In particular, vote-by-mail has a negligible effect on the percentage of homeowners and those with incomes greater than $100,000 per year in the electorate and a negative effect on the percentage of voters 65 or older in the electorate. These are all groups of voters that are most likely to support decreases in property tax revenue. In all, this section provides compelling evidence that the effects of vote-by-mail on municipal revenue and expenditures documented in this paper are not the result of changes to the composition of the electorate. Rather, contrary to previous work (Berinsky, Burns and Traugott 2001, Berinsky 2005), it appears that vote-by-mail slightly increases the proportion of less affluent voters who participate in Washington's municipal elections. Future work should further explore the consequences of vote-by-mail on the composition of the electorate.

Table 4: The Effects of Vote-by-Mail on the Composition of the Electorate (Full Data)

	Dependent variable:					
	Homeowner	Renter	$<$ \$40,000	$>$ \$100,000	Under 30	65 and Older
	(1)	(2)	(3)	(4)	(5)	(6)
Vote-by-Mail	-0.028	0.015	0.012^{*}	-0.020	0.002^{***}	-0.018^{**}
	(-0.066, 0.009)	(-0.006, 0.035)	(0.001, 0.024)	(-0.046, 0.005)	(0.001, 0.003)	(-0.030, -0.006)
Munic-Yr FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,374	1,374	1,374	1,374	1,374	1,374
Adjusted R^2	0.970	0.773	0.946	0.979	0.713	0.775

Note: 90 % confidence intervals in parentheses. *p$<$0.1; **p$<$0.05; ***p$<$0.01.

Conclusion

The rules that govern how elections are run can have profound implications on the incentives of elected officials and electoral accountability (e.g., Anzia 2011, Bechtel, Hangartner and Schmid 2016, Fowler 2013, Fujiwara 2015). Consequently, who gets to vote and how a voter casts his ballot affects the types of policies that are implemented in democracies. This paper examines how a particular electoral institution, vote-by-mail, affects electoral accountability in the context of

Washington state. I find that vote-by-mail results in voters being more likely to cast a vote in lower salience races. Further, the institution causes as a decrease in revenue, property taxes, and expenditures in Washington's municipalities. Exploiting a law that resulted in staggered over time changes in the use of vote-by-mail in Washington's counties with a difference-in-differences research design, these findings provide compelling evidence that vote-by-mail induces elected officials to be more responsive to their constituents.

As more political jurisdictions begin to adopt all-mail elections it is imperative that scholars understand the consequences of this institution. Since Oregon switched to vote-by-mail in 1998 there are now three states (Oregon, Washington, and Colorado) in the United States that hold exclusively vote-by-mail elections and some counties in California will begin to switch to all-mail elections in 2018. Further, there are rules in some states that allow certain sub-state jurisdictions to hold their elections by mail, and entire countries, including Switzerland, hold all-mail elections. Thus, it is clear that we should have solid understanding of how this institution shapes the incentives and behavior of elected officials. There has been much debate about the effects of vote-by-mail on voter turnout (e.g., Bergman and Yates 2011, Berinsky, Burns and Traugott 2001, Gerber, Huber and Hill 2013, Karp and Banducci 2000, Kousser and Mullin 2007, Magleby 1987, Richey 2008), but scholars have generally ignored other potential effects of the institution. The findings documented in this paper, consequently, broaden this literature by examining how vote-by-mail affects the information environment of elections, shapes the incentives of elected officials, and impacts public policy.

However, many questions about the effects of vote-by-mail still remain. For example, future work should document the precise impact of all-mail elections on levels of voter knowledge. In addition, other research finds that in low-information environments voters are more likely to use racial stereotypes as heuristics, which hurts the chances that candidates that are members of racial minority groups are elected to office (Crowder-Meyer, Gadarian and Trounstine 2018, Crowder-Meyer et al. 2018). Therefore, to the extent that vote-by-mail causes voters to gather more in-

formation about politics, the electoral reform may also subdue the effects of racial bias in voter decision making.

More broadly, these results speak to the nature of electoral accountability in the United States. It is well documented that the American electorate is biased in favor of those with a higher socioeconomic status (e.g. Schlozman, Verba and Brady 2012) and that public policy favors the affluent (e.g. Bartels 2016). Other work finds that institutions that induce accountability among local policymakers actually further biases policy outcomes away from the interests of individuals of a low socioeconomic status (Sances 2016), and I find that vote-by-mail, which many proponents describe as dramatically reducing the cost of voting, only results in small changes to the composition of the electorate. Thus, although the institution of vote-by-mail induces elected officials to implement policies more in line with their constituents interests, this results in public policy - lower property taxes and lower levels of spending - that actually further biases outcomes in favor of high socioeconomic status individuals. Do other electoral reforms in the United States that allegedly increase access to the ballot actually result in a more biased policy outcomes? There is still a great deal of work to be done to understand how the patchwork of electoral rules across the United States affects which groups of citizens policy outcomes favor.

References

Alt, James, Ethan Bueno De Mesquita and Shanna Rose. 2011. "Disentangling Accountability and Competence in Elections: Evidence From US Term Limits." *The Journal of Politics* 73(1):171–186.

Angrist, Joshua David and Jörn-Steffen Pischke. 2009. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press.

Ansolabehere, Stephen and Eitan Hersh. 2012. "Validation: What Big Data Reveal about Survey Misreporting and the Real Electorate." *Political Analysis* p. mps023.

Anzia, Sarah F. 2011. "Election Timing and the Electoral Influence of Interest Groups." *The Journal of Politics* 73(02):412–427.

Ashworth, Scott. 2012. "Electoral Accountability: Recent Theoretical and Empirical Work." *Annual Review of Political Science* 15:183–201.

Bartels, Larry M. 2016. *Unequal Democracy: The Political Economy of the New Gilded Age*. Princeton University Press.

Bechtel, Michael M, Dominik Hangartner and Lukas Schmid. 2016. "Does Compulsory Voting Increase Support for Leftist Policy?" *American Journal of Political Science* 60(3):752–767.

Bergman, Elizabeth and Philip A. Yates. 2011. "Changing Election Methods: How Does Mandated Vote-By-Mail Affect Individual Registrants?" *Election Law Journal* 10(2):115–127.

Berinsky, Adam J. 2005. "The Perverse Consequences of Electoral Reform in the United States." *American Politics Research* 33(4):471–491.

Berinsky, Adam J., Nancy Burns and Michael W. Traugott. 2001. "Who Votes by Mail?: A Dynamic Model of the Individual-Level Consequences of Voting-By-Mail Systems." *Public Opinion Quarterly* 65(2):178–197.

Berry, Christopher R. and Jacob E. Gersen. 2009. "Fiscal Consequences of Electoral Institutions." *The Journal of Law and Economics* 52(3):469–495.

Berry, Christopher R. and Jacob E. Gersen. 2010. "The Timing of Elections." *The University of Chicago Law Review* pp. 37–64.

Besley, Timothy. 2006. *Principled Agents?: The Political Economy of Good Government*. Oxford University Press.

Besley, Timothy and Anne Case. 1995*a*. "Does Electoral Accountability Affect Economic Policy Choices? Evidence from Gubernatorial Term Limits." *Quarterly Journal of Economics* 110(3):769–98.

Besley, Timothy and Anne Case. 1995*b*. "Incumbent Behavior: Vote Seeking, Tax Setting and Yardstick Competition." *American Economic Review* 85(1):25–45.

Bullock, Charles S. and Richard E. Dunn. 1996. "Election Roll-Off a Test of Three Explanations." *Urban Affairs Review* 32(1):71–86.

Cameron, A Colin, Jonah B Gelbach and Douglas L Miller. 2008. "Bootstrap-Based Improvements for Inference With Clustered Errors." *The Review of Economics and Statistics* 90(3):414–427.

Crowder-Meyer, Melody, Shana Kushner Gadarian and Jessica Trounstine. 2018. "Voting Can Be Hard, Information Helps." *Working Paper* .

Crowder-Meyer, Melody, Shana Kushner Gadarian, Jessica Trounstine and Kau Vue. 2018. "A Different Kind of Disadvantage: Candidate Race, Cognitive Complexity, and Voter Choice." *Working Paper* .

Einstein, Katherine Levine and Vladimir Kogan. 2016. "Pushing the City Limits: Policy Responsiveness in Municipal Government." *Urban Affairs Review* 52(1):3–32.

Eveland, Jr., William P. 2004. "The Effect of Political Discussion In Producing Informed Citizens: The Roles of Information, Motivation, and Elaboration." *Political Communication* 21(2):177–193.

Ferraz, Claudio and Frederico Finan. 2011. "Electoral Accountability and Corruption: Evidence From the Audits of Local Governments." *The American Economic Review* 101(4):1274–1311.

Fowler, Anthony. 2013. "Electoral and Policy Consequences of Voter Turnout: Evidence From Compulsory Voting in Australia." *Quarterly Journal of Political Science* 8(2):159–182.

Fujiwara, Thomas. 2015. "Voting Technology, Political Responsiveness, and Infant Health: Evidence from Brazil." *Econometrica* 83(2):423–464.

Gerber, Alan S., Gregory A. Huber and Seth J. Hill. 2013. "Identifying the Effect of All-Mail Elections on Turnout: Staggered Reform in the Evergreen State." *Political Science Research and Methods* 1(01):91–116.

Hajnal, Zoltan L and Paul G Lewis. 2003. "Municipal Institutions and Voter Turnout in Local Elections." *Urban Affairs Review* 38(5):645–668.

In Our View: A Good Way to Vote. 2010. *The Columbian* October 22.

Is Online Voting Next for Washington Voters? 2006. *The Chronicle* October 21.

Karp, Jeffrey A. and Susan A. Banducci. 2000. "Going Postal: How All-Mail Elections Influence Turnout." *Political Behavior* 22(3):223–239.

Kogan, Vladimir, Stéphane Lavertu and Zachary Peskowitz. 2016. "Do School Report Cards Produce Accountability Through the Ballot Box?" *Journal of Policy Analysis and Management* 35(3):639–661.

Kogan, Vladimir, Stéphane Lavertu and Zachary Peskowitz. 2018. "Election Timing, Electorate Composition, and Policy Outcomes: Evidence from School Districts." *American Journal Of Political Science* .

Kousser, Thad and Megan Mullin. 2007. "Does Voting by Mail Increase Participation? Using Matching to Analyze a Natural Experiment." *Political Analysis* 15(4):428–445.

Magleby, David B. 1987. "Participation in Mail Ballot Elections." *The Western Political Quarterly* 40(1):79–91.

Matsusaka, John G. 2004. *For the Many or the Few: How the Initiative Process Changes American Government*. University of Chicago Press, Chicago.

Nicholson, Stephen P. 2003. "The Political Environment and Ballot Proposition Awareness." *American Journal of Political Science* 47(3):403–410.

Persson, Torsten and Guido Enrico Tabellini. 2000. *Political Economics: Explaining Economic Policy*. MIT Press.

Rainey, Carlisle. 2014. "Arguing for a Negligible Effect." *American Journal of Political Science* 58(4):1083–1091.

Reed, Sam. 2007. "Washington States Vote-by-Mail Experience 2007." *Office of the Secretary of State* .

Richey, Sean. 2008. "Voting by Mail: Turnout and Institutional Reform in Oregon." *Social Science Quarterly* 89(4):902–915.

Sances, Michael W. 2016. "The Distributional Impact of Greater Responsiveness: Evidence from New York Towns." *The Journal of Politics* 78(1):105–119.

Schaffner, Brian F., Matthew Streb and Gerald Wright. 2001. "Teams Without Uniforms: The Nonpartisan Ballot in State and Local Elections." *Political Research Quarterly* 54(1):7–30.

Schlozman, Kay Lehman, Sidney Verba and Henry E. Brady. 2012. *The Unheavenly Chorus: Unequal Political Voice and the Broken Promise of American Democracy*. Princeton University Press.

Sharp, Elaine B. 1997. "A Comparative Anatomy of Urban Social Conflict." *Political Research Quarterly* 50(2):261–280.

Tausanovitch, Chris and Christopher Warshaw. 2014. "Representation in Municipal Government." *American Political Science Review* 108(3):605–641.

Trounstine, Jessica. 2010. "Representation and Accountability in Cities." *Annual Review of Political Science* 13:407–423.

Wattenberg, Martin P, Ian McAllister and Anthony Salvanto. 2000. "How Voting is Like Taking an Sat Test An Analysis of American Voter Rolloff." *American Politics Research* 28(2):234–250.

Online Appendix

A Summary Statistics

Table A.1: Summary Statistics of Municipal Election Data

Statistic	N	Mean	St. Dev.	Min	Max
Full Sample					
Turnout	1,683	33.128	14.186	0.198	95.385
Vote-by-Mail	1,683	0.564	0.496	0	1
Mayoral Race	1,683	0.253	0.435	0	1
Percent African American	1,683	1.438	2.485	0.000	18.466
Percent 65 or Older	1,683	14.157	7.439	1.300	79.200
Percent Latino	1,683	12.554	18.968	0.000	99.549
Median Income	1,683	49,239.240	23,511.770	4,671.000	205,625.000
Percent High School	1,683	83.337	13.009	19.100	100.000
Percent Urban	1,683	61.442	46.905	0.000	100.000
Total Population	1,683	13,692.170	42,040.280	24.000	603,174.000
Restricted Sample					
Turnout	1,545	33.239	14.430	0.198	95.385
Vote-by-Mail	1,545	0.551	0.498	0	1
Mayoral Race	1,545	0.249	0.433	0	1
Percent African American	1,545	1.532	2.567	0.000	18.466
Percent 65 or Older	1,545	13.803	7.358	1.300	79.200
Percent Latino	1,545	12.876	19.327	0.000	99.549
Median Income	1,545	50,618.310	23,934.810	4,671.000	205,625.000
Percent High School	1,545	83.497	13.320	19.100	100.000
Percent Urban	1,545	64.908	45.853	0.000	100.000
Total Population	1,545	14,727.310	43,714.830	24.000	603,174.000

Table A.2: Summary Statistics of Statewide Ballot Measure Data

Statistic	N	Mean	St. Dev.	Min	Max
Full Sample					
Ballot Roll-Off	502	6.018	2.502	0.540	14.305
Vote-by-Mail	502	0.265	0.442	0	1
Lagged Absentee	502	42.498	19.278	14.880	100.000
Initiative to the People	502	0.689	0.463	0	1
Percent African American	502	0.770	1.186	0.000	7.000
Percent 65 or Older	502	14.377	3.977	7.344	23.233
Percent Latino	502	6.426	9.593	0.223	47.100
Median Income	502	40,841.870	7,392.877	28,584.000	65,680.560
Percent High School	502	84.552	7.060	63.300	94.933
Percent Urban	502	0.517	0.314	0.000	0.968
Total Population	502	156,866.700	310,407.200	2,158.778	1,845,260.000
Restricted Sample					
Ballot Roll-Off	437	5.960	2.487	0.540	14.305
Vote-by-Mail	437	0.220	0.415	0	1
Lagged Absentee	437	39.801	16.567	14.880	80.480
Initiative to the People	437	0.689	0.464	0	1
Percent African American	437	0.849	1.249	0.000	7.000
Percent 65 or Older	437	14.227	4.014	7.344	23.233
Percent Latino	437	6.829	10.100	0.223	47.100
Median Income	437	41,611.960	7,413.463	28,584.000	65,680.560
Percent High School	437	84.666	7.433	63.300	94.933
Percent Urban	437	0.571	0.290	0.000	0.968
Total Population	437	176,172.700	328,259.600	2,158.778	1,845,260.000

Table A.3: Summary Statistics of Audit Report Data

Statistic	N	Mean	St. Dev.	Min	Max
2005					
Vote-by-Mail (1 Year Bandwidth)	172	0.547	0.499	0	1
Average Findings (1 Year Bandwidth)	172	0.151	0.402	0.000	3.000
Vote-by-Mail (2 Year Bandwidth)	58	0.414	0.497	0	1
Average Findings (2 Year Bandwidth)	58	0.190	0.322	0.000	1.000
2006					
Vote-by-Mail (1 Year Bandwidth)	120	0.367	0.484	0	1
Average Findings (1 Year Bandwidth)	120	0.229	0.514	0.000	3.000
Vote-by-Mail (2 Year Bandwidth)	114	0.368	0.485	0	1
Average Findings (2 Year Bandwidth)	114	0.193	0.757	0.000	7.000

Table A.4: Summary Statistics of Municipal Revenue and Expenditure Data

Statistic	N	Mean	St. Dev.	Min	Max
Full Sample					
Log Revenue Per Capita	2,655	7.437	0.603	4.834	10.583
Log Total Tax Revenue Per Capita	2,655	6.170	0.639	3.908	8.042
Log Property Tax Revenue Per Capita	2,654	5.143	0.587	3.134	6.989
Log Expenditures Per Capita	2,655	7.407	0.612	4.256	10.441
Vote-By-Mail	2,598	0.488	0.500	0	1
Percent African American	2,655	1.448	2.510	0.000	17.566
Percent 65 or Older	2,655	14.126	6.802	1.500	79.200
Percent Latino	2,655	11.750	18.065	0.000	98.536
Median Income	2,655	49,258.650	23,324.790	4,750.000	204,375.000
Percent High School Degree	2,655	83.726	12.503	20.011	100.000
Percent Urban	2,655	61.521	46.686	0.000	100.000
Total Population	2,655	13,945.760	43,089.520	24.000	595,240.000
Competitiveness	2,223	0.293	0.260	0.000	0.978
Mayor-Council	2,655	0.808	0.394	0	1
Restricted Sample					
Log Revenue Per Capita	2,387	7.430	0.602	4.834	10.583
Log Total Tax Revenue Per Capita	2,387	6.181	0.628	3.908	7.952
Log Property Tax Revenue Per Capita	2,386	5.164	0.585	3.134	6.989
Log Expenditures Per Capita	2,387	7.400	0.614	4.256	10.441
Vote-By-Mail	2,387	0.461	0.499	0	1
Percent African American	2,387	1.534	2.611	0.000	17.566
Percent 65 or Older	2,387	13.822	6.669	1.500	79.200
Percent Latino	2,387	11.999	18.466	0.000	98.536
Median Income	2,387	50,631.390	23,922.950	4,750.000	204,375.000
Percent High School Degree	2,387	83.879	12.844	20.011	100.000
Percent Urban	2,387	64.202	45.840	0.000	100.000
Total Population	2,387	14,895.390	45,181.160	24.000	595,240.000
Competitiveness	2,002	0.298	0.259	0.000	0.933
Mayor-Council	2,387	0.798	0.401	0	1

Table A.5: Summary Statistics of Catalist Data

Statistic	N	Mean	St. Dev.	Min	Max
Full Sample					
Proportion Homeowner	1,404	0.387	0.267	0.000	1.000
Proportion Likely Homeowner	1,404	0.144	0.103	0.000	0.750
Proportion Homeowner or Likely Homeowner	1,404	0.531	0.292	0.000	1.000
Proportion Renter	1,404	0.0004	0.001	0.000	0.019
Proportion Likely Renter	1,404	0.036	0.045	0.000	0.348
Proportion Renter or Likely Renter	1,404	0.036	0.045	0.000	0.348
Proportion Income $<$ 40,000	1,404	0.335	0.182	0.000	1.000
Proportion Income $>$ 100,000	1,404	0.167	0.210	0.000	1.000
Proportion Under 30	1,404	0.009	0.016	0.000	0.111
Proportion Over 65	1,404	0.485	0.107	0.000	1.000
Restricted Sample					
Proportion Homeowner	1,289	0.409	0.266	0.000	1.000
Proportion Likely Homeowner	1,289	0.146	0.103	0.000	0.750
Proportion Homeowner or Likely Homeowner	1,289	0.555	0.287	0.000	1.000
Proportion Renter	1,289	0.0004	0.001	0.000	0.019
Proportion Likely Renter	1,289	0.037	0.046	0.000	0.348
Proportion Renter or Likely Renter	1,289	0.037	0.046	0.000	0.348
Proportion Income $<$ 40,000	1,289	0.329	0.184	0.000	1.000
Proportion Income $>$ 100,000	1,289	0.178	0.216	0.000	1.000
Proportion Under 30	1,289	0.009	0.016	0.000	0.111
Proportion Over 65	1,289	0.481	0.107	0.000	1.000

B Robustness Checks: Audit Reports

Placebo tests for the analyses examining the effects of vote-by-mail on the average number of findings are displayed in Figure D.1. The point estimates displayed in the figure are the effect of vote-by-mail in treated municipalities (calculated with one-year bandwidth in the same way as Equation 2 in the body of the paper) in time period $t-1$ (the year before switching) on the average number of findings. The results indicate no pretreatment differences between treatment and control groups for municipalities that switched in both 2005 and 2006.

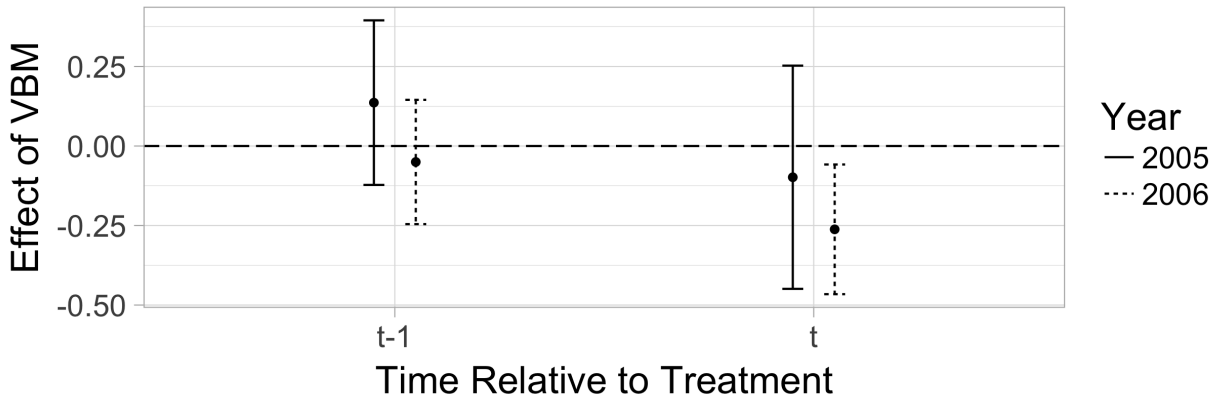


Figure B.1: Placebo test of the effect of vote-by-mail on average number of audit findings for municipalities treated in 2005 and 2006 with one-year bandwidth around treatment year. Point estimates as well as block-bootstrapped (county-level blocks) 95 % confidence intervals are displayed. Estimates at time t are the same as in the body of the paper. Estimates at time $t-1$ represent the effect of switching to vote-by-mail one year in the future.

C Robustness Checks and Additional Results: Municipal Fiscal Policy

C.1 Leads and Lags

I estimate a series of models similar to the Granger test for causality in order to examine the validity of the parallel trends assumption, which is the necessary identifying assumption for a difference-in-differences design (Angrist and Pischke 2009). Specifically, I estimate a series of models of the following form,

$$Y_{m,t} = \sum_{\tau=0}^{n} \beta_{-\tau} VBM_{m,t-\tau} + \sum_{\tau=1}^{q} \beta_{\tau} VBM_{m,t+\tau} + \boldsymbol{\delta}^T \mathbf{X}_{m,t} + \lambda_m + \tau_t + \epsilon_{m,t} \tag{3}$$

where the variable $VBM_{m,t}$ now only takes on a value of one in the year in which a municipality switched to vote-by-mail and, thus, $VBM_{m,t-1}$ is one only in the year before a municipality switched to vote-by-mail. As before, $Y_{m,t}$ are the municipal fiscal policy dependent variables, $\mathbf{X}_{m,t}$ is a vector of demographic controls, and λ_m and τ_t are municipal and year fixed effects. The sums

in the empirical model allow for lead and lag variables. Specifically, I vary the value of n to allow for up to 3 lagged variables, or potential pretreatment effects, and the value of q to allow for a lead variable, or potential posttreatment effects. The expectation is that the lead variables should not be statistically significant, because if they were that would indicate pretreatment differences between treatment and control groups.

The results of these models for the log revenue per capita and log expenditures per capita are displayed in Table C.1 and Table C.2, respectively. All of the lead variables are statistically insignificant, which provides evidence that there are not pretreatment differences between the two groups and support that the parallel trends assumption holds. Further, the indicator for the year of the switch to vote-by-mail and the lagged variable are negatively across all specifications of the model and statistically significant in most.

Moving next to Table C.3, I run the leads and lags models with log total tax revenue per capita as the dependent variable. In the models that include one lead and one lag variable, the lead variable is statistically significant with both the full (Column 1) and restricted (Column 4) samples. This indicates that it is possible municipalities with lower levels of tax revenue selected into vote-by-mail before other municipalities. However, I argue that this if not concerning for a number of reasons. First, this is not a very robust finding and as addition lead variables are included, the effect disappears. Second, as the results in the body of the paper showed the effect of vote-by-mail had the least robust effect on total tax revenue. Finally, the leads and lags models with the other dependent variables do not indicate that there are similar selection issues.

In Table C.4 I present that models with log property tax revenue per capita as the dependent variable. Across all of the specifications of the model there is no evidence that municipalities with lower property taxes switched to vote-by-mail earlier. In fact, if anything it appears that the coefficients on the lead variables are positive and in one specification (Column 2) marginally significant.

Table C.1: The Effects of Vote-by-Mail on Municipal Revenue

	Dependent variable:					
	Log Revenue Per Capita					
	Full Sample			Restricted Sample		
	(1)	(2)	(3)	(4)	(5)	(6)
VBM_{t-3}			0.007			−0.005
			(0.050)			(0.052)
VBM_{t-2}		−0.006	−0.004		−0.011	−0.013
		(0.034)	(0.046)		(0.031)	(0.045)
VBM_{t-1}	−0.006	−0.008	−0.006	0.002	−0.001	−0.002
	(0.033)	(0.038)	(0.043)	(0.030)	(0.036)	(0.041)
VBM_t	−0.033	−0.034	−0.033	−0.041*	−0.043*	−0.044
	(0.025)	(0.027)	(0.031)	(0.022)	(0.025)	(0.030)
VBM_{t+1}	−0.042*	−0.043*	−0.042	−0.053**	−0.054*	−0.055
	(0.023)	(0.025)	(0.029)	(0.027)	(0.029)	(0.035)
Munic-Yr FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,597	2,597	2,597	2,386	2,386	2,386
Adjusted R^2	0.707	0.707	0.707	0.709	0.709	0.708

Note: Robust standard errors clustered by county in parentheses. *p<0.1; **p<0.05; ***p<0.01. Control variables include the following demographic controls: percent Black, percent Latino, median income, percent with high school degree or higher, percent urban and total population.

Table C.2: The Effects of Vote-by-Mail on Municipal Expenditures

	Dependent variable:					
	Log Expenditures Per Capita					
	Full Sample			Restricted Sample		
	(1)	(2)	(3)	(4)	(5)	(6)
VBM_{t-3}			0.011			−0.003
			(0.050)			(0.051)
VBM_{t-2}		0.007	0.010		0.007	0.006
		(0.037)	(0.049)		(0.035)	(0.048)
VBM_{t-1}	−0.015	−0.013	−0.011	−0.010	−0.008	−0.009
	(0.029)	(0.034)	(0.039)	(0.026)	(0.030)	(0.035)
VBM_t	−0.027	−0.026	−0.024	−0.030	−0.029	−0.030
	(0.024)	(0.027)	(0.032)	(0.021)	(0.024)	(0.031)
VBM_{t+1}	−0.042*	−0.041*	−0.039	−0.054**	−0.053*	−0.054
	(0.022)	(0.024)	(0.030)	(0.027)	(0.029)	(0.035)
Munic-Yr FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,597	2,597	2,597	2,386	2,386	2,386
Adjusted R^2	0.699	0.699	0.699	0.700	0.700	0.700

Note: Robust standard errors clustered by county in parentheses. *p<0.1; **p<0.05; ***p<0.01. Control variables include the following demographic controls: percent Black, percent Latino, median income, percent with high school degree or higher, percent urban and total population.

Table C.3: The Effects of Vote-by-Mail on Total Municipal Tax Revenue

	Dependent variable:					
	Log Tax Revenue Per Capita					
	Full Sample			Restricted Sample		
	(1)	(2)	(3)	(4)	(5)	(6)
VBM_{t-3}			0.011			0.010
			(0.011)			(0.011)
VBM_{t-2}		0.0005	0.004		0.003	0.006
		(0.016)	(0.018)		(0.013)	(0.015)
VBM_{t-1}	-0.022^{**}	-0.022	-0.020	-0.020^{**}	-0.019^{*}	-0.017
	(0.011)	(0.015)	(0.016)	(0.008)	(0.010)	(0.012)
VBM_t	-0.035^{**}	-0.035^{**}	-0.033^{**}	-0.037^{**}	-0.036^{**}	-0.034^{**}
	(0.014)	(0.016)	(0.017)	(0.015)	(0.016)	(0.017)
VBM_{t+1}	-0.028^{**}	-0.028^{*}	-0.025^{*}	-0.027^{*}	-0.027	-0.024
	(0.014)	(0.015)	(0.015)	(0.016)	(0.017)	(0.017)
Munic-Yr FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,597	2,597	2,597	2,386	2,386	2,386
Adjusted R^2	0.959	0.958	0.958	0.958	0.958	0.958

Note: Robust standard errors clustered by county in parentheses. *p<0.1; **p<0.05; ***p<0.01. Control variables include the following demographic controls: percent Black, percent Latino, median income, percent with high school degree or higher, percent urban and total population.

Table C.4: The Effects of Vote-by-Mail on Municipal Property Tax Revenue

	Dependent variable:					
	Log Property Tax Revenue Per Capita					
	Full Sample			Restricted Sample		
	(1)	(2)	(3)	(4)	(5)	(6)
VBM_{t-3}			0.026***			0.025***
			(0.008)			(0.008)
VBM_{t-2}		0.024**	0.032***		0.016*	0.024**
		(0.011)	(0.012)		(0.009)	(0.010)
VBM_{t-1}	0.010	0.016	0.022*	0.006	0.011	0.016
	(0.011)	(0.012)	(0.012)	(0.011)	(0.012)	(0.012)
VBM_t	0.003	0.007	0.013	−0.001	0.001	0.007
	(0.010)	(0.010)	(0.011)	(0.010)	(0.010)	(0.011)
VBM_{t+1}	0.0001	0.004	0.009	0.002	0.004	0.009
	(0.009)	(0.010)	(0.011)	(0.010)	(0.011)	(0.012)
Munic-Yr FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,596	2,596	2,596	2,385	2,385	2,385
Adjusted R^2	0.935	0.935	0.935	0.933	0.933	0.933

Note: Robust standard errors clustered by county in parentheses. *p<0.1; **p<0.05; ***p<0.01. Control variables include the following demographic controls: percent Black, percent Latino, median income, percent with high school degree or higher, percent urban and total population.

C.2 Time Trends

I further probe the municipal fiscal policy results by running models with municipal specific time trends. To do this I estimate models of the following form,

$$Y_{m,t} = \beta_1 VBM_{m,t} + \boldsymbol{\delta}^T \mathbf{X}_{m,t} + \lambda_m + \lambda_m * t + \tau_t + \epsilon_{m,t} \tag{4}$$

which is the same as the baseline specification except for the fact that I now include a time trend, t, multiplied by municipality dummies, which allows each municipality to follow a different trend. The results for with the models in which log expenditures per capita and log total revenue per

capita are the dependent variables are displayed in Table C.5. The models with the tax revenue dependent variables are displayed in Table C.6.

Table C.5: The Effects of Vote-by-Mail on Municipal Revenue and Expenditures

	Dependent variable:							
	Log Revenue Per Capita				Log Expenditures Per Capita			
	Full Sample		Restricted Sample		Full Sample		Restricted Sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Vote-by-Mail	−0.039	−0.039	−0.051*	−0.050*	−0.032	−0.033	−0.042	−0.042
	(0.034)	(0.034)	(0.028)	(0.028)	(0.032)	(0.032)	(0.027)	(0.027)
Munic-Yr FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Munic FExYr Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	2,598	2,598	2,387	2,387	2,598	2,598	2,387	2,387
Adjusted R^2	0.744	0.747	0.747	0.749	0.739	0.742	0.742	0.745

Note: Robust standard errors clustered by county in parentheses. *p<0.1; **p<0.05; ***p<0.01. Control variables include the following demographic controls: percent Black, percent Latino, median income, percent with high school degree or higher, percent urban and total population.

The results of these models are largely consistent with those presented in the body of the paper and, notably, across all of the specifications the coefficient on the vote-by-mail dependent variables stays negative and substantively similar to the models without the time trends. That being said, in some of the models with log revenue per capita and log expenditures per capita the coefficient on the vote-by-mail dependent variable does not maintain standard levels of statistical significance.

Table C.6: The Effects of Vote-by-Mail on Municipal Tax Revenue

	Dependent variable:							
	Log Tax Revenue Per Capita				Log Property Tax Revenue Per Capita			
	Full Sample		Restricted Sample		Full Sample		Restricted Sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Vote-by-Mail	-0.034^{**}	-0.033^{**}	-0.043^{***}	-0.041^{***}	-0.030^{**}	-0.030^{**}	-0.028^{*}	-0.027^{*}
	(0.016)	(0.015)	(0.013)	(0.013)	(0.012)	(0.012)	(0.014)	(0.015)
Munic-Yr FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Munic FExYr Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	2,598	2,598	2,387	2,387	2,597	2,597	2,386	2,386
Adjusted R^2	0.975	0.975	0.975	0.975	0.958	0.959	0.957	0.957

Note: Robust standard errors clustered by county in parentheses. *p<0.1; **p<0.05; ***p<0.01. Control variables include the following demographic controls: percent Black, percent Latino, median income, percent with high school degree or higher, percent urban and total population.

C.3 Additional Municipal Fiscal Policy Results

In this section, I present additional analyses of the municipal finance data. First, I examine if the structure of municipal governments affects the relationship between vote-by-mail and municipal revenue and expenditures. I expect that the effects will be driven by vote-by-mail municipalities. I examine this hypothesis by estimating the following equation:

$$\begin{aligned} Y_{m,t} =& \beta_1 \textit{VBM}_{m,t} + \beta_2 \textit{MayorCouncil}_m + \\ & \beta_3 \textit{VBM}_{m,t} \times \textit{MayorCouncil}_m + \\ & \boldsymbol{\delta}^T \mathbf{X}_{m,t} + \tau_t + \epsilon_{m,t} \end{aligned} \tag{5}$$

where $\textit{MayorCouncil}_m$ is a dummy variable equal to 1 if a municipality has a mayor-council government and $Y_{m,t}$ represents the various municipal finance dependent variables. I exclude municipality fixed effects from these analyses because mayor-council status is time invariant. Therefore, these estimates from theses analyses do not have a causal interpretation, but nevertheless can shed light on the consequences of the implementation of vote-by-mail in Washington. The results of

these models are displayed in Columns 1 (expenditures), 3 (revenue), 5 (total taxes), and 7 (property taxes) of Table C.7. The results show that the coefficient on the vote-by-mail indicator is consistently positive but only statistically significant for the total taxes dependent variable, but across all of the dependent variables the interaction between vote-by-mail and the mayor-council dummy variable is negative and statistically significant. This indicates that the expected level of revenue and expenditures is lower in vote-by-mail municipalities with mayor-council governments compared to those with council-manager governments, which is consistent with the logic that policy outcomes in municipalities with mayor-council governments are more responsive to electoral incentives.

Table C.7: The Effects of Vote-by-Mail on Municipal Revenue and Expenditures (Full Sample)

	Dependent variable:							
	Expenditures		Revenue		Total Taxes		Property Taxes	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Competitiveness		−0.014		0.005		0.040**		−0.025
		(0.048)		(0.052)		(0.019)		(0.021)
Vote-by-Mail	0.119	−0.051	0.129*	−0.029	0.081**	−0.002	0.019	−0.031***
	(0.086)	(0.038)	(0.076)	(0.040)	(0.036)	(0.018)	(0.041)	(0.011)
Mayor-Council	0.131		0.132		0.025		0.115*	
	(0.122)		(0.113)		(0.100)		(0.067)	
Vote-by-Mail*Mayor	−0.231***		−0.234***		−0.083*		−0.089**	
	(0.076)		(0.065)		(0.045)		(0.045)	
Vote-by-Mail*Comp		−0.037		−0.107		−0.076***		0.035
		(0.068)		(0.073)		(0.025)		(0.030)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipal FE	Yes	No	Yes	No	Yes	No	Yes	No
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,596	2,170	2,596	2,170	2,596	2,170	2,595	2,169
Adjusted R^2	0.193	0.728	0.181	0.730	0.436	0.964	0.461	0.945

Note: Robust standard errors clustered by county in parentheses. *p<0.1; **p<0.05; ***p<0.01. Control variables include the following demographic controls: percent Black, percent Latino, median income, percent with high school degree or higher, percent urban and total population.

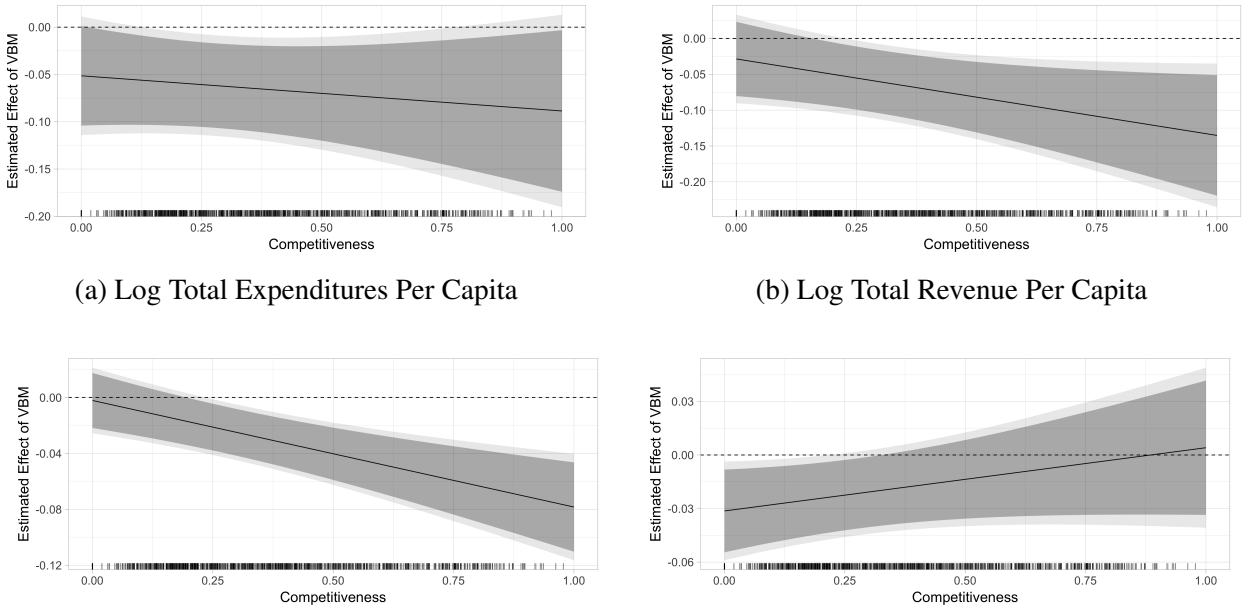
I next examine if the competitiveness of elections for municipal office conditions the effects of vote-by-mail. To measure electoral competitiveness in each municipality, I simply divide the

number of votes for the second highest vote getter in a give race by the total number of votes for the candidate who won. Then, I take the average of this proportion across all races in a given municipality for each election year. Thus, the measure of competitiveness is equal to 0 when all races in a municipality are uncontested and 1 if the the top two candidates tied in all races. Due to the timing of municipal elections in Washington, this variable is only observed every other year. I expect that electoral competition will magnify the effects of vote-by-mail, because incumbents who believe that they will face strong challengers may be more likely to be responsive to changes in electoral systems and their constituents. I test this hypothesis by estimating equations of the following form,

$$\begin{aligned} Y_{m,t} =& \beta_1 \textit{VBM}_{m,t} + \beta_2 \textit{Competitiveness}_{m,(t-1|t-2)} + \\ & \beta_3 \textit{VBM}_{m,t} \times \textit{Competitiveness}_{m,(t-1|t-2)} + \\ & \boldsymbol{\delta}^T \mathbf{X}_{m,t} + \lambda_m + \tau_t + \epsilon_{m,t} \end{aligned} \tag{6}$$

where $\textit{Competitiveness}_{m,(t-1|t-2)}$ measures the average division of votes in city council and mayoral elections in the previous election cycle, and the other variables are the same as before. The results, displayed in Table C.7, show that for the expenditures (Column 2), revenue (Column 4), and total taxes (Column 6) dependent variables that the interaction between the vote-by-mail dummy and the competitiveness variable is negative. This indicates that the impact of vote-by-mail becomes more negative as electoral competition increases. However, the interaction term in the model with property tax revenue as the dependent variable (Column 8) is positive, which is opposite of what is expected.

In order to aid in the interpretation of the interaction variables, Figure C.1 displays the marginal effect of vote-by-mail on the dependent variables of interest across different levels of competitiveness using the results from the models with the full sample of municipalities. The solid black line in the figures represents the estimated marginal effect of switching to vote-by-mail at different values of the competitiveness variable. The light shaded region around the line is a 95% confi-



(a) Log Total Expenditures Per Capita

(b) Log Total Revenue Per Capita

(c) Log Total Tax Revenue Per Capita

(d) Log Property Tax Revenue Per Capita

Figure C.1: Marginal effects of vote-by-mail on municipal revenue and expenditures. 95% and 90% confidence intervals are displayed in light and dark grey, respectively. Observed values of the competitiveness variable are marked on the x-axis.

dence interval on these estimates and the dark shaded region is an 90% confidence interval. The marginal effects plots indicate that as competitiveness increases the negative effect of vote-by-mail on total expenditures (Panel A), total revenue (Panel B), and total tax revenue (Panel C) becomes more larger. This relationship appears to be strongest for the total revenue and total tax dependent variables. Somewhat surprisingly Panel D of Figure C.1 shows that the relationship between electoral competitiveness and revenue from property taxes is in the the opposite direction. Specifically, as competition increases the estimated marginal effect of vote-by-mail becomes statistically indistinguishable from zero.

Nevertheless, these results indicate that the relationship between vote-by-mail and levels of taxing and spending in Washington's municipalities varies with municipal institutions as well as the competition of elections. When there are institutions in place that increase accountability or competitive elections, municipal fiscal policy outcomes are generally more responsive the constituent interests after the switch to vote-by-mail. These results provide additional support for the

theory put forth in this paper that vote-by-mail induces responsiveness among politicians through electoral incentives.

I now examine the timing of the effects of vote-by-mail on municipal revenue and expenditures, because elected officials cannot immediately change the outcomes of interest. I do this by including a series of lags of the vote-by-mail indicator. This strategy is similar to the models estimated with Equation 3, but I do not include lead variables. The results of these models are displayed in Table C.8. The analysis shows that the effects of vote-by-mail on the municipal finance dependent variables happen, at least, in the year after the switch to the institution for all of the dependent variables except total tax revenue.

Table C.8: The Effects of Vote-by-Mail on Municipal Revenue and Expenditures (Full Sample)

	Dependent variable:			
	Total Expenditures	Total Revenue	Total Tax Rev	Property Tax Rev
	(1)	(2)	(3)	(4)
VBM_t	−0.037	−0.043	−0.030***	−0.008
	(0.027)	(0.027)	(0.011)	(0.010)
VBM_{t+1}	−0.059**	−0.057**	−0.027**	−0.015
	(0.025)	(0.024)	(0.013)	(0.013)
VBM_{t+2}	−0.049	−0.041	−0.017	−0.041**
	(0.047)	(0.049)	(0.015)	(0.020)
VBM_{t+3}	−0.027	−0.016	−0.001	−0.025
	(0.049)	(0.052)	(0.018)	(0.019)
VBM_{t+4}	−0.040	−0.034	0.015	−0.012
	(0.041)	(0.040)	(0.022)	(0.014)
Munic-Yr FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Observations	2,597	2,597	2,597	2,596
Adjusted R^2	0.699	0.707	0.958	0.935

Note: Robust standard errors clustered by county in parentheses. *p<0.1; **p<0.05; ***p<0.01. Control variables include the following demographic controls: percent Black, percent Latino, median income, percent with high school degree or higher, percent urban and total population.

D Robustness Checks and Additional Results: Voter Behavior

D.1 Municipal Turnout

Table D.1 displays the results of models in the form of Equation 3 with municipal turnout as the dependent variable. Across all of the specifications of the model, the leads of the vote-by-mail indicator variable are not statistically significant. This indicates that there are not pretreatment differences between treatment and control municipalities.

Table D.1: The Effects of Vote-by-Mail on Municipal Turnout

	Dependent variable:			
	Turnout			
	Full Sample		Restricted Sample	
	(1)	(2)	(3)	(4)
VBM_{t-2}	−0.674	−1.002	−0.774	−1.024
	(1.324)	(0.970)	(1.362)	(0.995)
VBM_{t-1}	−1.367	−2.113	−1.582	−2.190
	(1.563)	(1.335)	(1.642)	(1.402)
VBM_t	1.146	0.538	1.155	0.574
	(1.608)	(1.304)	(1.688)	(1.331)
VBM_{t+1}	2.776*	2.360*	2.856*	2.485*
	(1.586)	(1.373)	(1.644)	(1.451)
Controls	No	Yes	No	Yes
Munic-Yr FE	Yes	Yes	Yes	Yes
Observations	1,662	1,662	1,525	1,525
Adjusted R^2	0.664	0.698	0.672	0.707
Residual Std. Error	8.131	7.706	8.157	7.713

Note: Robust standard errors clustered by county in parentheses. *p<0.1; **p<0.05; ***p<0.01. Control variables include indicator for if there was a mayoral race as well as the following demographic controls: percent Black, percent Latino, median income, percent with high school degree or higher, percent urban and total population.

Table D.2 displays the results of models with municipality specific time trends as the dependent variable in the form of Equation 4 with municipal turnout as the dependent variable. The results are robust to the inclusion of time trends.

Table D.2: The Effects of Vote-by-Mail on Municipal Turnout

	Dependent variable:			
	Turnout			
	Full Sample		Restricted Sample	
	(1)	(2)	(3)	(4)
Vote-by-Mail	3.557***	3.737***	3.778***	3.848***
	(0.857)	(0.674)	(0.936)	(0.763)
Controls	No	Yes	No	Yes
Munic-Yr FE	Yes	Yes	Yes	Yes
Munic FE x Yr Trend	Yes	Yes	Yes	Yes
Observations	1,685	1,685	1,547	1,547
Adjusted R^2	0.730	0.759	0.735	0.766

Note: Robust standard errors clustered by county in parentheses. *p<0.1; **p<0.05; ***p<0.01. Control variables include indicator for if there was a mayoral race as well as the following demographic controls: percent Black, percent Latino, median income, percent with high school degree or higher, percent urban and total population.

D.2 Ballot Roll-Off

The results of the ballot roll-off models with the inclusion of county-specific time trends are shown in Table D.3. It appears that the estimates with the restricted sample of counties are no longer statistically significant. However, for the models that account for previous mail-in ballot usage (Columns 5 and 6) the coefficients on the vote-by-mail variable are in the expected direction.

Table D.3: The Effects of Vote-by-Mail on Ballot Roll-Off

	Dependent variable:					
	Ballot Roll-Off					
	Full Sample			Restricted Sample		
	(1)	(2)	(3)	(4)	(5)	(6)
Vote-by-Mail	0.127	−0.126	0.288	0.152	−0.023	−0.623
	(0.493)	(0.779)	(1.690)	(1.602)	(1.422)	(1.953)
Lagged Absentee		−0.037			0.077	
		(0.069)			(0.068)	
Vote-by-Mail*Lagged Absentee			−0.004***			0.014
			(0.00000)			(0.024)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Munic-Yr FE	Yes	Yes	Yes	Yes	Yes	Yes
Munic FE x Yr Trend	Yes	Yes	Yes	Yes	Yes	Yes
Observations	502	502	502	437	437	437
Adjusted R^2	0.655	0.654	0.654	0.664	0.664	0.663

Note: Robust standard errors clustered by county in parentheses. *p<0.1; **p<0.05; ***p<0.01. Control variables include indicators for ballot measure type as well as the following demographic controls: percent Black, percent Latino, median income, percent with high school degree or higher, percent urban and total population.

E Robustness Checks: Composition of Electorate

E.1 Restricted Data

Table D.1 displays the estimated effect of vote-by-mail on the composition of the electorate in Washington's municipal elections with the restricted data. The results are largely consistent with those displayed in the body of the paper.

Table D.2 and Table D.3 displays the results of models with the disaggregated housing measures available in the Catalist data with the full and restricted samples of municipalities, respectively. Specifically, rather than combining "likely homeowners" and "homeowners" as well as "likely renters" and "renters" into the same category I run models with each individual category as the dependent variable. The results are similar to those presented in the text of the paper. Vote-by-mail does not have a statistically significant effect on any of the housing dependent variables, and,

Table E.1: The Effects of Vote-by-Mail on the Composition of the Electorate (Restricted Data)

	Dependent variable:					
	Homeowner	Renter	$< 40{,}000$	$> 100{,}000$	Under 30	65 and Older
	(1)	(2)	(3)	(4)	(5)	(6)
Vote-by-Mail	−0.031	0.016	0.009	−0.023	0.002*	−0.016**
	(−0.073, 0.010)	(−0.007, 0.039)	(−0.004, 0.023)	(−0.050, 0.005)	(0.0001, 0.003)	(−0.029, −0.00
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,259	1,259	1,259	1,259	1,259	1,259
Adjusted R^2	0.968	0.770	0.956	0.979	0.721	0.778

Note: 90 % confidence intervals in parentheses. *p<0.1; **p<0.05; ***p<0.01.

further, the bounds 90% confidence intervals presented indicate substantively negligible effects (Rainey 2014).

Table E.2: The Effects of Vote-by-Mail on the Composition of the Electorate (Full Data)

	Dependent variable:			
	Homeowner	Likely Homeowner	Renter	Likely Renter
	(1)	(2)	(3)	(4)
Vote-by-Mail	−0.032	0.004	−0.00005	0.015
	(−0.079, 0.015)	(−0.007, 0.014)	(−0.0002, 0.0001)	(−0.006, 0.036)
Year FE	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Observations	1,374	1,374	1,374	1,374
Adjusted R^2	0.966	0.878	0.673	0.770

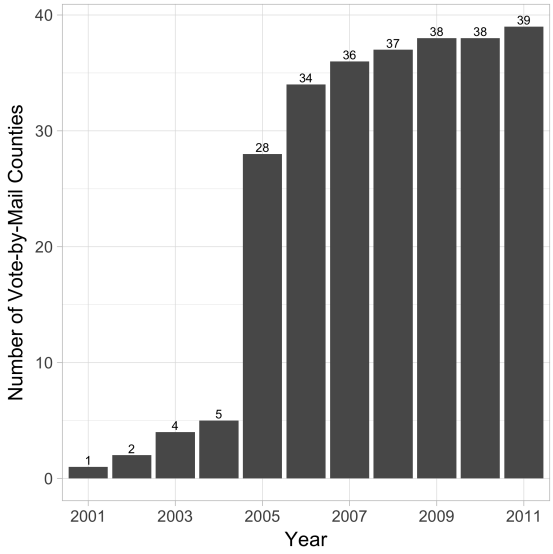
Note: 90 % confidence intervals in parentheses. *p<0.1; **p<0.05; ***p<0.01.

Table E.3: The Effects of Vote-by-Mail on the Composition of the Electorate (Restricted Data)

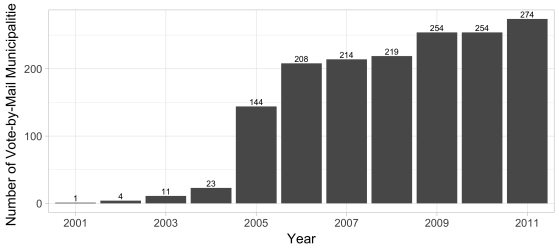
	Dependent variable:			
	Homeowner	Likely Homeowner	Renter	Likely Renter
	(1)	(2)	(3)	(4)
Vote-by-Mail	−0.038	0.006	−0.0001	0.016
	(−0.088, 0.013)	(−0.003, 0.016)	(−0.0002, 0.0001)	(−0.007, 0.039)
Year FE	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Observations	1,259	1,259	1,259	1,259
R^2	0.972	0.902	0.743	0.815

Note: 90 % confidence intervals in parentheses. *p<0.1; **p<0.05; ***p<0.01.

F Count of Treated Units By Year



(a) Number of Counties



(b) Number of Municipalities

Figure F.1: Number of counties (Panel A) and municipalities (Panel B) holding vote-by-mail elections in Washington 2001 - 2011. Note that the 6 municipalities whose borders cross county boundaries are removed from the sample.