

# **Ballot Order, Ballot Roll-Off, and Election Outcomes: Evidence from Local Referenda in Ohio**

Michael Conlin  
Michigan State University

Walter Melnik  
Michigan State University

Paul Thompson  
Oregon State University

**Abstract:** According to Ohio law, the ballot order of local referenda rotates annually, based on the level of administrative division (municipalities, townships, school districts, and counties) in which a particular referendum is contested. This provides a source of variation in ballot ordering of referenda that is potentially exogenous to unobservable characteristics of referenda and the administrative divisions in which they take place. We construct a dataset of tax and bond referenda contested between 2000 and 2012 that includes counts of yes and no votes, as well as counts of the number of voters who cast ballots as residents of the administrative division in which any referendum was contested. Using this data, we estimate the effect of a referendum's ballot position on the likelihood that voters at the ballot box will abstain from casting a yes or no vote on that referendum. We also consider the effect of ballot position on the likelihood that a particular referendum passes on votes.

**PRELIMINARY – DO NOT CITE**

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## I. Introduction

Research in economics, marketing and political science has demonstrated that the size of the choice set and the sequence of choices affect an individual's decisions, in environments ranging from on-line grocery orders to car sales to elections. Several empirical papers provide evidence of (what they term) "choice fatigue," which tests whether individuals' choices depend on how many decisions the individuals have made previously. Building on recent research by Augenblick and Nicholson (2012), this paper tests whether the probability individuals vote for a particular referendum decreases depending on where the referendum appears on the ballot. Referred to by political scientists as roll-off, this paper tests whether the probability an individual votes on a referendum decreases the further down the referendum is on the ballot. Using information on Ohio tax and bond referenda proposed by local administrative divisions (municipalities, townships, school districts, and counties) and different variation for identification, this paper complements the work of Augenblick and Nicholson which finds evidence of roll-off in San Diego County referenda from 1992 to 2006. Consistent with the empirical evidence from these San Diego County referenda, we also find that Ohio election outcomes depend on ballot position.

Using information on 13,370 Ohio referenda and legislation that varies ballot ordering across elections, we test for the presence of roll-off, and for whether roll-off depends on the age of the individual. According to Ohio law, the ballot order of local referenda rotates annually, based on the level of administrative division which proposed the particular referendum. This provides a source of variation in ballot ordering of referenda that is arguably exogenous to unobservable characteristics of referenda and the administrative divisions. We construct a dataset of tax and bond referenda contested between 2000 and 2012 that includes counts of yes and no

votes, as well as counts of the number of voters who cast ballots as residents of the administrative division in which any referendum was contested. Using this data, we estimate the effect of a referendum's ballot ranking on the likelihood that voters at the ballot box will abstain from casting a yes or no vote on that referendum. We also consider the effect of ballot position on the likelihood that a particular referendum passes on votes.

The rest of this paper is organized as follows: Section II summarizes the related literature while Section III provides an overview of the referendum process in Ohio. Section IV describes the dataset and provides summary statistics of the data. Section V presents the major findings of the paper; that falloff may only be an issue for older voters and referenda are more likely to pass if they appear later on the ballot. Section VI summarizes the findings and discusses further research to address the potential importance of "choice fatigue" in election settings.

## **II. Related Literature**

The most convincing strategy for identifying a causal relationship between ballot position and election outcomes is found in Augenblick and Nicholson (2012). They consider a set of 392 contests in San Diego County in the 1990s and early 2000s. Although the ranking of different types of contests is fixed by law in California, a contest may be ranked higher or lower on the ballot across precincts, due to variation in the number of more highly ranked contests in different precincts. As long as the number of contests in a particular county is independent of voter and referenda characteristics that would affect the decision to vote, the authors are able to identify a causal effect of ballot position on both roll-off and election results.

A number of other papers consider similar questions of the relationship between ballot order or ballot length on the one hand, and roll-off or election outcomes on the other. Bowler et al. (1992) regress both roll-off and probability of voting no on ballot rank for a set of California

ballot proposals. Although they find significant effects in both cases, they fail to account for many of the proposition characteristics that may be correlated with ballot length. Selb (2008) considers the effect of ballot length on voting patterns, using a set of Swiss referendum elections. Although the author fails to find a statistically significant relationship between ballot length and no votes, he does estimate a statistically significant effect of ballot length on the variance of no votes. Ho and Imai (2008) estimate the causal relationship between the position in which a candidate's name is listed on the ballot within a contest and the vote share that the candidate receives, using a dataset of state office elections in California. They identify a statistically and economically significant effect for minor party candidates and for primary elections. Ho and Imai (2006) also find a positive relationship between ballot position and votes received in the 2004 California recall election.

We undertake two empirical strategies for estimating the effect of ballot position on election outcomes. First, in the spirit of Augenblick and Nicholson (2012), we construct a measure of how many ballot choices a voter needs to make prior to the referenda. Although we are not able to pinpoint the exact number of prior choices an individual makes, we are able to determine the number of tax related referenda from other administrative division that appear prior on the ballot. Second, we directly apply the variation in proposal ranking stipulated in Section 3505.06 (B) (1) of the Ohio Revised Code. Since the ranking of ballot proposals is rotated every year according to the administrative division that issued the proposal, we estimate the causal effect of administrative division ballot ranking upon proposals issued by a particular administrative division.

### III. Environment<sup>1</sup>

#### *Administrative divisions:*

Local government within the State of Ohio comprises five classes of administrative division. 88 county jurisdictions encompass the entire area of state. Each is governed by a three person board of county commissioners (Ohio Revised Code § 301), with the authority to maintain a courthouse, jail, and various other public services. At the sub-county level two distinct types of administrative division, townships and municipalities, carry out general purpose government functions. As of 2012 there were 937 municipalities and 1308 townships within the state of Ohio, encompassing the entire area of the state. Municipalities form by incorporation under a charter (Ohio Revised Code ch. 707). An elected council governs each municipality, with the authority to levy taxes, issue bonds, administer fire and police services, and maintain infrastructure, among other powers. Depending upon its organization as a “city manager” or “federal” municipal corporation, the municipality may have an elected mayor as well (Ohio Revised Code §§ 705.51-705.81).<sup>2</sup> The civil township is governed by a board of directors. Townships with population greater than 3500 may adopt “home rule” status and provide similar public services to those provided by municipal corporations (Ohio Revised Code §505.04). A given individual may reside solely within a township, solely within a municipality, or within both; particularly in more rural areas of the state, it is not unusual for a municipality to lie within the boundaries of a township. A single municipality or a single township may span the jurisdiction of two or more counties.

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<sup>1</sup> This section draws heavily from Ohio Secretary of State (2014) and US Census Bureau (2012), as well as the Ohio Revised Code. In cases where we draw explicitly from the Revised Code, we cite the chapter and section.

<sup>2</sup> Municipalities with population of less than 5000 are referred to as “villages,” while those with population of more than 5000 are referred to as “cities.”

Regular school districts include city school districts, local school districts, and exempted village school districts. The jurisdictions of these school districts do not overlap. Special “joint vocational school districts” (henceforth “JVSDs”) encompass two or more regular school districts. Like municipalities and townships, regular school districts and JVSDs frequently span the boundaries of multiple counties.<sup>3</sup>

Ohio law also allows for the formation of various special purpose districts with limited authority to tax or borrow. Port authorities, library districts, park districts, and joint ambulance and fire districts provide a single service or range of services, often under the auspices of a county, municipality, or township. In those cases when a special purpose district’s boundary is the same as the township or county boundary, the same taxing authority governs both jurisdictions. However, in many cases a unique board of trustees governs the finance and administration of the special purpose district. For this reason, these may properly be considered as a separate class of administrative division.

### *3.1 Ohio Referendum Process*

According to Ohio Law, many local government actions require majority approval through a referendum election. Ballot questions and issues include fiscal decisions, specifically the levy of taxes and the issuance of bonds, as well as non-fiscal decisions such as charter amendments, zoning questions, gas and electricity aggregation, and local liquor options. In this paper we consider the impact of ballot position on referenda regarding the levy of taxes and the issuance of bonds. We focus on these fiscal referenda for a variety of reasons. First, Ohio law standardizes the proposal process for these referenda, and specifies a particular “taxing authority” which may propose referenda for each administrative division, while non-fiscal

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<sup>3</sup> Communities of 75,000 or more may also establish “community college districts.”

referenda may initiate from a legislative authority or through a petition process. In addition, tax and bond referenda generally impact all or most of the electorate, while a zoning ordinance or liquor option may prove entirely irrelevant to all but a small fraction of voters. We are also able to determine the expenditure that these levies and issues seek to fund, and we can determine various other characteristics, as whether the levy replaces a previous tax. Thus, we may control for various characteristics that affect the salience, palatability, and welfare impacts of fiscal referenda.

Among the tax and bond referenda in our dataset, counties proposed 1269 taxes or bonds, municipalities proposed 4111 taxes or bonds, townships proposed 5732 taxes or bonds, school districts proposed 5117 taxes or bonds<sup>4</sup>, and JVSJs proposed 114 tax or bond questions. 69% of these contests took place during general elections, while an additional 26% took place during primary elections, including 8% during presidential primaries.<sup>5</sup> Within this paper, we consider referenda contested during general and primary elections, and the clustering of elections around these dates allowed us to maintain a substantial number of observations.

We also expect voter fatigue to prove more relevant, and more dependent on ballot order, on general and primary election dates. Voters face a longer ballot on general and primary election dates than on other election dates, making fatigue a relevant factor. Since more referenda are placed on ballots general election and primary ballots, moreover, the variation in

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<sup>4</sup> This includes 4200 school district referenda between 2003 and 2012.

<sup>5</sup> Elections in Ohio are held on four uniform election dates during years without a presidential election, and on three uniform election dates during presidential election years. Taxing authorities may propose ballot questions for any of these election dates. The general election occurs in November. In years where no presidential election occurs, primary elections take place in May, while special elections may be held in February or August. During presidential election years, primary elections take place in March, superseding both the May primary and, in every year since 2000, the February special election. 11,277 of the 16,343 contests in our dataset fall on general election dates, while 4316 fall on primary election dates.

ballot order on these dates increases. On general election dates between 2003 and 2011 the average voter faced (13.42) tax and ballot questions, while many special elections featured only a single ballot question. On general election and presidential primary dates, finally, the voter composition likely proves quite different than on special election dates, as voters who are less informed about local issues turnout to vote on national and state level contests (Dunne et al. 1997, Meredith 2006).

### *3.2 Tax and Bond Referenda*

Tax and bond referenda in the state of Ohio fall within four general categories: bond issue referenda, property tax referenda, sales or excise tax referenda, and income tax referenda. For every administrative division that may issue debt or levy taxes, the Ohio Revised Code specifies a “taxing authority” authorized to propose necessary taxes and bonds. For a county, the taxing authority is the county commissioners; for a municipality, the legislative authority (e.g. city council); for a township, the township trustees; and for a school district or JVS, the district board of education. Generally, in order to place a tax or bond referendum on the ballot, the taxing authority must first adopt a resolution describing the purpose of the tax or bond issue, and describing various characteristics of the tax or bond issue (such as the rate of taxation in the case of a tax levy, or the total debt issued in the case of a bond).

### *3.3 Property Tax*

Among the taxing authorities who may propose tax and bond referenda, there is some variation in the state code regarding the allowable type of taxes, the purpose of taxes and bonds issued, and the procedure by which a tax or bond may be placed in the ballot. Any taxing authority of any subdivision may raise a property tax of less than 10 mills (one percent) for certain legally authorized purposes. Any property tax in excess of this rate, however, must be



approved in a referendum election. In the case of property tax levies, which constitute 87% of the proposals in our dataset, the taxing authority must categorize the levy within one of three characterizations. The taxing authority may request an “additional levy,” that is, a new property tax added to the millage currently in place. An additional levy need not serve the same purpose as any existing levy. If an existing millage is set to expire, the taxing authority may request a “renewal levy” to extend a tax of the same millage rate for a longer period of time. The taxing authority may submit the renewal levy at any election during the last year in which the tax is collected, or at the general election of the previous year. Finally, the taxing authority may issue a “replacement levy” that extends, increases, or decreases a property millage currently in place. The replacement levy must serve the same purpose as the levy that is superseded; moreover, the ballot language placed before the voters must specify if the replacement increases or decreases the current tax rate. Although the majority of referenda fall into only one of the three categories, some fall into more than one category. In some cases, for example, the taxing authority will combine a proposal to renew and existing tax with a request for a higher rate; such a proposal would qualify as a renewal and an additional millage.

This variation in the type of property tax proposal proves valuable for a number of reasons. First, this characteristic will likely help to explain the number of yes votes, and the probability of passage, for tax levy proposals. Particularly relevant to the question of falloff, moreover, the characterization of a levy as renewal, replacement, or additional creates variation in the default option that voters face. For voters deciding on an additional levy, a no vote represents the default option. For voters deciding on a renewal levy, however, a yes vote could represent the default choice. If we expect that fatigued voters are more likely to vote for the default option, then we would expect the passage rate of additional levy proposals to decrease,

and the passage rate of renewal levy proposals to decrease, as the ballot position of these proposals becomes less favorable. Additionally, we may find that this characteristic of a proposal helps to explain roll-off as well. For example, fatigued voters may tend to vote for the default option when the default option seems clearly defined, but abstain when the default option seems ambiguous.<sup>6</sup>

A property tax levied by a school district, moreover, may fall into one of three categories. First, regular levies finance operating expenditures, permanent improvements, and a range of other types of expenditures. A regular levy may remain in force for five years generally, or continuously if it finances operating or current expenditures. Second, a municipal school district and partnering community school levy may be raised. Finally, an emergency levy may be raised under certain circumstances. This levy must replace an existing levy and serve the same purpose, and may not be collected for more than 10 years. However, the rate of the emergency levy may exceed the rate of the existing levy. Generally, the taxing authority must submit the proposal to levy a property tax to the board of elections at least 90 days before the election in which the proposal will be contested, although this interval varies depending on the type of levy (emergency school district levies, for example, only require 80 days).

### *3.4 Bonds*

A taxing authority must submit a bond issue to a referendum election in two cases. First, the state sets certain statutory limitations on debt, which the taxing authority must not exceed without voter approval. Second, if the repayment of a bond will require a property tax in excess of 10 mills, then the taxing authority must submit the bond to an election before it is issued. Any municipality, township, county, or school district, and many types of special purpose district,

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<sup>6</sup> We plan to address this issue in future work.

may issue bonds. The taxing authority must submit the proposal to issue a bond to the board of elections at least 90 days before the election in which the proposal will be contested.

### *3.5 Income tax*

Only a municipality or a school district may levy a tax on income and any income tax exceeding 1 percent must pass the test of voter approval. When a municipal council or school board wishes to impose an income tax in excess of this limit, it must file a copy of the ordinance, as well as a resolution stating the purpose of the tax, the rate of the tax, and the duration of the tax (the duration may be a fixed period of time, or the tax may be levied continuously into the future). Both the ordinance and the resolution must be filed with the county board of elections at least 90 days prior to the election.

### *3.6 Sales and use tax*

Only a municipality or county may levy a sales or excise tax; our dataset includes only sales taxes by counties. The board of county commissioners must hold two hearings before the sales and use tax takes effect, and must submit the question to the Board of Elections 90 days before the election is held. In a few cases, the taxing authority may levy an emergency sales tax without voter approval, as long as such a measure gains unanimous approval of the taxing authority. Of course, such measures do not appear in our dataset.

### *3.7 Ballot order:*

In general and special elections within the state of Ohio, the ballot is divided into three sequentially ordered sub-ballots (Revised Code §§ 3505.03 – 3505.06). First, the “Office type ballot” presents choices of candidates chosen through the nominating process, including state and federal candidates, as well as many candidates for local offices. Second, the “Nonpartisan

ballot” includes candidates for state or local school board, candidates for judicial office, and candidates for municipalities and townships not nominated through a primary. Finally, the questions and issues ballot contains proposals to be accepted or rejected through the referendum process.

Ohio law regulates order within the questions and issues ballot as follows (Revised Code § 3505.06 (B) (1)). State questions and issues lie at the top of the ballot. Questions and issues contested at the local level, however, are rotated annually. In 1997, county referenda were placed at the top of the ballot, followed by municipal referenda, township referenda, and finally school and other district<sup>7</sup> referenda. The next year, and every year following, the top administrative division category moved to the bottom of the ballot, while every other category moved up one rank. Thus, in 2010, municipalities were placed first, followed by townships, school and other districts, and counties. In 2011, however, townships were placed first, and municipalities fell to the bottom.

#### **IV. Data and Summary Statistics**

Our data derive from two principal sources. First, we gathered data on local tax and bond referendum elections taking place between February 2000 and November 2012 from summaries of these elections on the Ohio Board of elections website. From this source, we are able to identify the subdivision that proposed the tax levy or bond issue, the number of yes and no votes, and various other characteristics of the referendum. These other characteristics include the

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<sup>7</sup> The “school and other districts” category contains some, but not all, of the special purpose districts mentioned above. Many of the special purpose districts that we identified overlapped with the jurisdiction of one or more townships. From conversations with officials at the Ohio Secretary of State’s office, we determined that special purpose districts encompassing a township and incorporated areas (municipalities) within that township would fall into the “school and other districts” category, while a special purpose district encompassing only the unincorporated areas of a township would not. We were forced to omit some special purpose districts, because we were unable to determine from our data which voters resided in these districts.

proposed type of tax (property tax, income tax, sales and use tax, or bond) the purpose of the tax or bond (i.e. police, fire, capital improvements) and whether the tax renewed a previous tax or replaced a previous tax at a different rate or duration (see page 7).

Second, we gathered data on registered voters. The Ohio Board of Elections maintains an active file of all registered voters, recording the address, year of birth, political affiliation, and voting turnout record for every registered voter in the state. We were able to obtain a larger file containing all active and inactive records of every registered voter who participated in an election between 2000 and 2011. From this file, we can determine whether a particular voter cast a ballot, in a given election, as a resident of a given administrative division. For any proposal issued by the taxing authority of an administrative division, then, we can count how many voters turned out to vote and saw that particular proposal on the ballot. We can then compare this tally to the count of voters who actually voted yes or no on the proposal. For each election, we are also able to determine descriptive statistics on the age and political affiliation of the voters within the administrative division at the time of the election. The active/inactive voter file also gives us the birth year and political affiliation of each voter. We merged the turnout, age, and political affiliation data from the active/inactive file with the referendum elections that we had gathered, according to the administrative division that had proposed the election. Thus, we were able to obtain turnout and some demographic information on voters, for the various elections in our dataset.

Originally, we had gathered data on 16,343 elections. However, we dropped all elections that did not contain a count of yes or no votes, as well as elections that took place during either February or August (i.e., special elections). We also dropped all of the elections that may have taken place in a special district that was not coterminous with a township, for two reasons. First,

except where special purpose districts were coterminous with another jurisdiction, we were not able to identify the number of voters in the district from the FTP file. Second, we were in some cases unable to identify whether an election would have been ranked among the “school and other districts” or with a different jurisdiction. This left us with a dataset containing 13,370 elections.

Table 1 provides means and standard deviations for many of our variables. A few of these variables warrant some additional explanation. “Falloff” gives the percentage of voters who cast ballots on which a particular referendum appeared, but did not cast a yes or no vote for that referendum –  $(1 - \text{Referendum Votes} / \text{Ballots}) * 100$ . Referendum Votes, which averaged 5989, gives the number of ballots cast by residents of the administrative division that voted on the referendum. Ballot gives the number of total ballots cast by residents including those where the individual did not vote on the referendum. For a given referendum in our sample, among the residents of the administrative division that proposed the referendum, an average of 7.68% of registered voters cast ballots in the election, but did not vote yes or no on that referendum. Because the voter file did not provide reliable counts of the number of voters who cast ballots for every election, we are only able to calculate falloff for 7,613 referenda in our sample. “Renewal millage,” “replacement millage,” and “new millage” indicate whether a property tax referendum renews or replaces a previously existing tax. The next five variables indicate the administrative division that proposed the referendum in question.

We use two variables to measure ballot position. “Rank on ballot” indicates whether proposals from the administrative division proposing a particular referendum are ranked first, second, third, or fourth in the year that the referendum is issued. “Number of preceding tax referenda on the ballot” describes the average number of tax referenda that a resident of an

administrative division would see before reaching referenda issued by that administrative division. Consider a county proposing a referendum in 2011. County referenda are ranked third in that year, after school district and township referenda. Thus, “number of preceding tax referenda on the ballot” would include the average number of school and township tax referenda faced by a resident of that county.

Table 2 provides descriptive statistics by the type of administrative division issuing a particular referendum. Property tax referenda constitute a significant majority for every type of administrative division, although school districts proposed a significant number of bonds and both K-12 school districts and municipalities proposed a large number of income tax referenda. As expected, turnout is highest for counties and vocational school districts (which generally span multiple counties) and lowest for municipalities and townships. We note significant variation in pass rates, from just 48% for vocational school districts and 54% for K-12 school districts to 85% for townships. Also, K-12 and vocational school districts are much more likely to propose a new tax than townships, municipalities, or counties.

Figure 1 plots the number of tax and bond referenda proposed in each of the primary and general elections between 2003 through 2012 (excluding non-school referenda for November 2003, for which we were unable to obtain yes and no votes). Three observations from this figure merit noting. First, the number of referenda proposed remains roughly constant across years. Second, as noted above, referenda proposed during the general election outnumber those proposed during the primary election by almost three to one, although the ratio fluctuates somewhat across years. Finally, the number of referenda proposed during a general election does not vary significantly based on whether that election is a presidential or gubernatorial election.<sup>8</sup>

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<sup>8</sup> Gubernatorial elections took place in 2002, 2006, and 2010.

Since turnout and voter composition in presidential and gubernatorial elections differ from turnout and voter composition in other elections, this seems particularly worthy of note.

Figure 2 plots the proportion of referenda that pass, along with average fall-off, for referenda between 2003 and 2012. Neither probability of passage, nor fall-off, vary significantly across years. We do note, however, that referenda held during general elections are generally more likely to pass. On the other hand, average fall-off for referenda held during general elections generally exceeds average fall-off for referenda held during primary elections.

## V. Empirical Specifications

When considering the effect of ballot position on fall-off and the probability that a referendum passes, we use two different measures for ballot position. The first is the number of tax referenda from the other administrative divisions that preceded the referendum on the ballot. While we do not have information on the number of other items on the ballot, we are able to control for the number of state and national items on the ballot by including election date indicators as covariates. However, this does not control for the number of local candidate elections (such as school boards, city council, mayor, county clerk, legislators, etc.) or the number of non-tax referenda which vary across jurisdictions. When using the number of preceding referenda, our concern is that this variable is correlated with the number of other types of ballot items and that this number captures unobservables pertaining to the administrative unit that is correlated with both falloff and the probability of passing.<sup>9</sup> The second measure is the rank order of the administrative division that placed the referendum on the ballot. While this measure does not capture the number of preceding tax referenda on the ballot, the prior concern is less of an issue. We prefer using rank for this reason, as well our concern that when an

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<sup>9</sup> We speculate that the number of tax referendum items on the ballot is positively correlated with the number of these other types of items.



administrative unit places a tax referendum on the ballot may depend on their expectation of whether the other overlapping administrative divisions have a tax referendum on the ballot.<sup>10</sup>

To estimate the effect of ballot position on falloff, we consider the following linear model

$$\text{Falloff}_{rt} = \alpha_t + \beta_1 (\text{BallotPosition}_{rt}) + \beta_2 (\text{Votersover65}_{rt}) + \beta_3 \mathbf{X}_{rt} + \varepsilon_{rt}$$

where  $\text{Falloff}_{rt}$  equals  $(1 - \text{Referendum Votes}_{rt} / \text{Ballots}_{rt}) * 100$  for referendum  $r$  on election date  $t$ ,  $\text{BallotPosition}_{rt}$  is either the number of preceding referenda or the rank,  $\text{Votersover65}_{rt}$  is percent of voters over 65 years of age, and  $\mathbf{X}_{rt}$  is a vector of referendum characteristics that are likely to influence falloff. These include indicators for which administrative division proposed the referendum; whether the referendum involved a millage renewal, a replacement millage or a new millage; and the purpose of the millage.<sup>11</sup> The parameters  $\alpha_t$ ,  $\beta_1$ ,  $\beta_2$  and  $\beta_3$  are unobserved, with  $\alpha_t$  being an election date fixed effect. The random variable  $\varepsilon_{rt}$  measures unobservable factors influencing falloff.

Columns (1) and (4) in Table 3 contain the estimates of this base specification when the number of preceding tax referenda and rank are used as measures of ballot position, respectively. For both measures, the estimate of  $\beta_1$  is very close to zero and not statistically significant. If voter falloff was significant, we would expect  $\beta_1$  to be positive. The negative and statistically significant estimates of  $\beta_2$  suggest that individuals over the age of 65 who go to the voting booth

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<sup>10</sup> We are less concerned that an administrative division's decision to place a tax referendum on the ballot depends on the division's rank in that particular year.

<sup>11</sup> The set of administrative divisions include school district, vocational school, municipality, township and county. The set of millage purposes include emergency medical service, cemetery, community center, fire, police, permanent capital, roads, library, general expenditures, parks/recreation, community college, zoo, child services, sewer, flood prevention, deficit avoidance, general bond current expenditures for school, school capital improvement, classroom facilities, new school, school permanent improvement, recreational, and other. Controlling for this set of purposes also controls for the type of taxation (sales, property, income and earned income) because a specific type of tax usually funds specific purposes.

are more likely to vote on the referendum. Perhaps these individuals are better informed on the referendum relative to younger voters. The other parameter estimates indicate that individuals filling out a ballot are less likely to cast a vote on: (i) a municipality or county tax referendum than a school tax referendum and (ii) a replacement millage than a renewal or new millage.

To test whether falloff differs for individuals over 65 years of age, we interact percent of voters over 65 with the measure of ballot position and add this interaction term to the set of covariates in the base specification. The coefficient estimates associated with this interaction term are contained in Columns (2) and (5) of Table 3. These estimates are positive for both measures of ballot position and statistically significant at the five percent level when the ballot position measure is the number of preceding referenda. These relatively large positive coefficient estimates, along with the estimates from the base specification, suggests that falloff may only be an issue for relatively old voters. We also test whether falloff for voters over 65 varies depending on whether the referendum involves schools relative to municipalities/townships/counties. This specification includes as a covariate an interaction between Percent of Voters over 65, Number Preceding or Rank, and School District Referendum indicator. The coefficient estimates associated with this specification, contained in Columns (3) and (6) of Table 3, provide mixed results depending on the measure of ballot position. We find evidence that falloff for individuals over 65 years of age is greater for school district referenda only when we use rank as the measure of ballot position.

Along with falloff, we are also interested in how ballot position affects whether a referendum passes. We test this by estimating the same specifications as in Table 3 but using whether a referendum passes as the dependent variable. Assuming the error term is normally distributed, the estimates from this probit regression are contained in Table 4. The positive

coefficient estimates associated with the two measures of ballot position in the base specification (Columns (1) and (4)) suggests that referenda are more likely to pass if they appear later on the ballot. This could be due to selection in terms of what types of voters are more likely to not vote for items later on the ballot, or due to the types of referenda varying according to the rank ordering for that year. In terms of the estimates associated with the other covariates, it appears that (i) the probability of passing does not depend on the percent of voters over 65 years of age, (ii) municipality/township referenda are more likely to pass than school district referenda, and (iii) referenda involving renewal and replacement millages are more likely to pass than referenda involving new millages. In terms of the other specifications, it does not appear that the relationship between the probability of passing and ballot location differs depending on the percent of voters over 65 years of age.

## **VI. Conclusion**

While our findings suggest that “fatigue” may not be a significant concern for younger voters, we do find evidence that individuals over 65 years of age are more likely to not vote on referenda that appear later on the ballot. Because age is potentially correlated with not only preferences but also knowledge of the referendum, this differential effect of fatigue could change what types of referenda pass. This in turn could have significant welfare implications. While our results demonstrate that referenda are more likely to pass if they appear later on the ballot, we do not address the potential changes in the types of referenda that pass and fail. To provide insight into this issue, we have obtained individual home sales information by administrative unit. Using a regression discontinuity design, we plan to test whether the effect on home prices of a referendum passing varies based on ballot order.

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**TABLE 1**  
**Summary Statistics**

Variables	Mean (Standard Deviations)
Falloff (1-Referendum Votes/Ballots)*100 <sup>1</sup>	7.68 (4.63)
Referendum Votes	5989 (22,861)
Referendum Passes	0.73 (0.44)
Renewal Millage	0.422 (0.494)
Replacement Millage	0.225 (0.417)
New Millage	0.377 (0.485)
K-12 Public School Referendum	0.275 (0.446)
Municipality Referendum	0.273 (0.446)
Township Referendum	0.370 (0.483)
Vocational School Referendum	0.007 (0.084)
County Referendum	0.073 (0.260)
Rank on Ballot (1 to 4)	2.53 (1.07)
Number of Preceding Tax Referenda on Ballot	5.22 (6.67)
Percent of Voters over 65 years of age	0.248 (0.073)
Observations	13,370

Note 1: Number of Ballots are available for 7,613 of the 13,370 referenda elections.

**TABLE 2**  
**Referenda Characteristics by Administrative Unit**  
**(Means and Standard Deviations)**

	School Districts	Voc. School Districts	Municipalities	Townships	Counties
Total Turnout	5,641 (9,315)	36,883 (39,439)	2,716 (18,176)	1,463 (2,647)	35,258 (55,981)
Renewal Tax	0.33 (0.47)	0.30 (0.46)	0.44 (0.50)	0.45 (0.50)	0.35 (0.48)
Replacement Tax	0.06 (0.24)	0.16 (0.37)	0.24 (0.43)	0.32 (0.47)	0.32 (0.47)
New Tax	0.60 (0.49)	0.58 (0.50)	0.34 (0.47)	0.25 (0.43)	0.40 (0.49)
Proposed Bond	0.14 (0.34)	0.09 (0.29)	0.01 (0.12)	0.004 (0.062)	0.01 (0.10)
Proposed Sales Tax					0.05 (0.22)
Proposed earned income tax	0.04 (0.19)				
Proposed income tax	0.11 (0.31)		0.12 (0.32)		
Proposed property tax	0.75 (0.43)	0.91 (0.29)	0.87 (0.34)	1.00 (0.06)	0.94 (0.24)
Referenda Passed	0.54 (0.50)	0.48 (0.50)	0.74 (0.44)	0.85 (0.36)	0.72 (0.45)
Bond Amount (Millions)	26.1 (22.8)	27.7 (17.0)	50.9 (11.8)	3.09 (4.58)	7.70 (4.87)
Millage Rate	5.35 (2.92)	1.08 (0.60)	2.56 (1.79)	1.59 (1.11)	1.10 (0.89)
Income Tax Rate	0.85 (0.33)		0.66 (0.53)		
Number of Districts	568	31	742	1,109	88

Figure 1: Number of Referenda

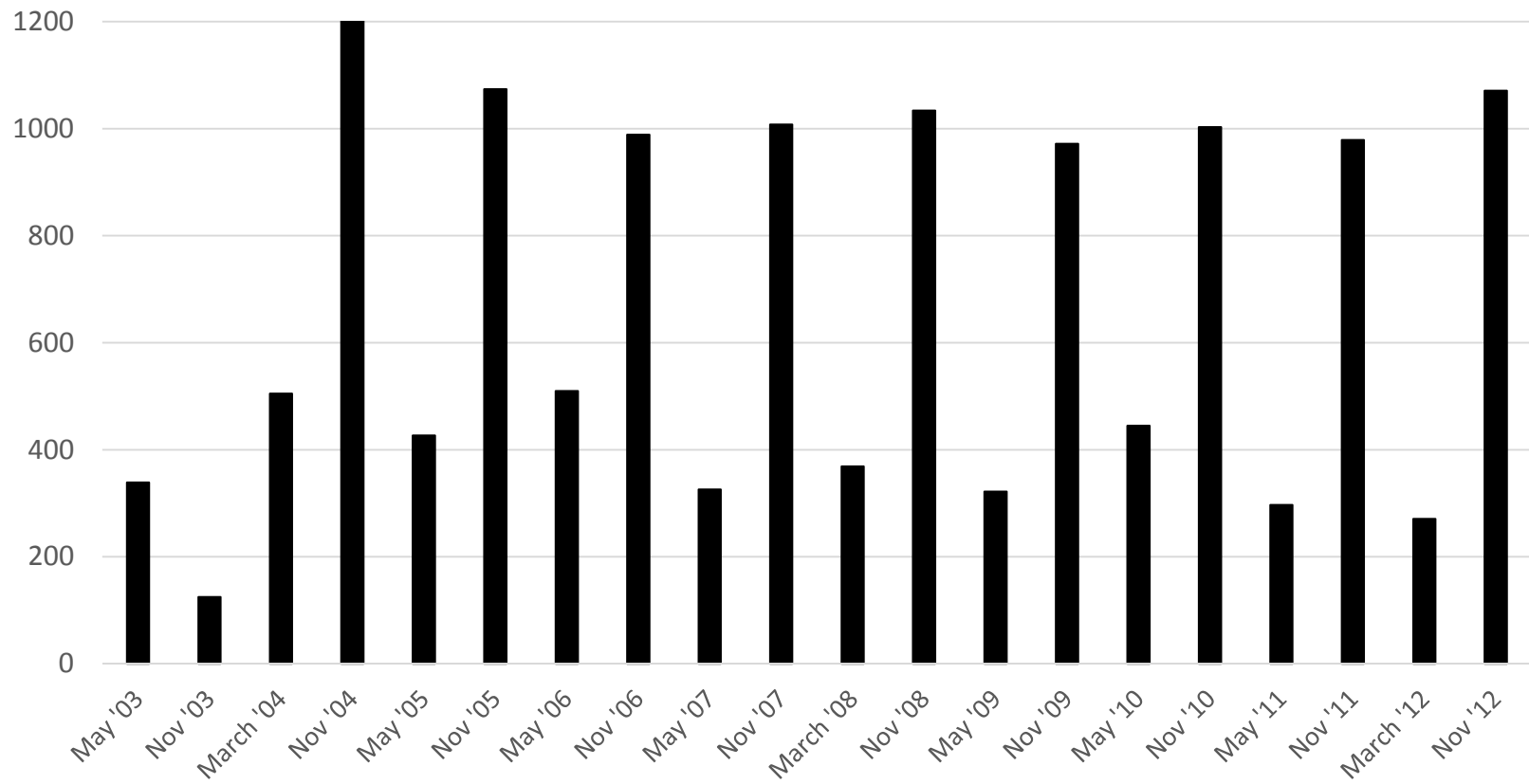
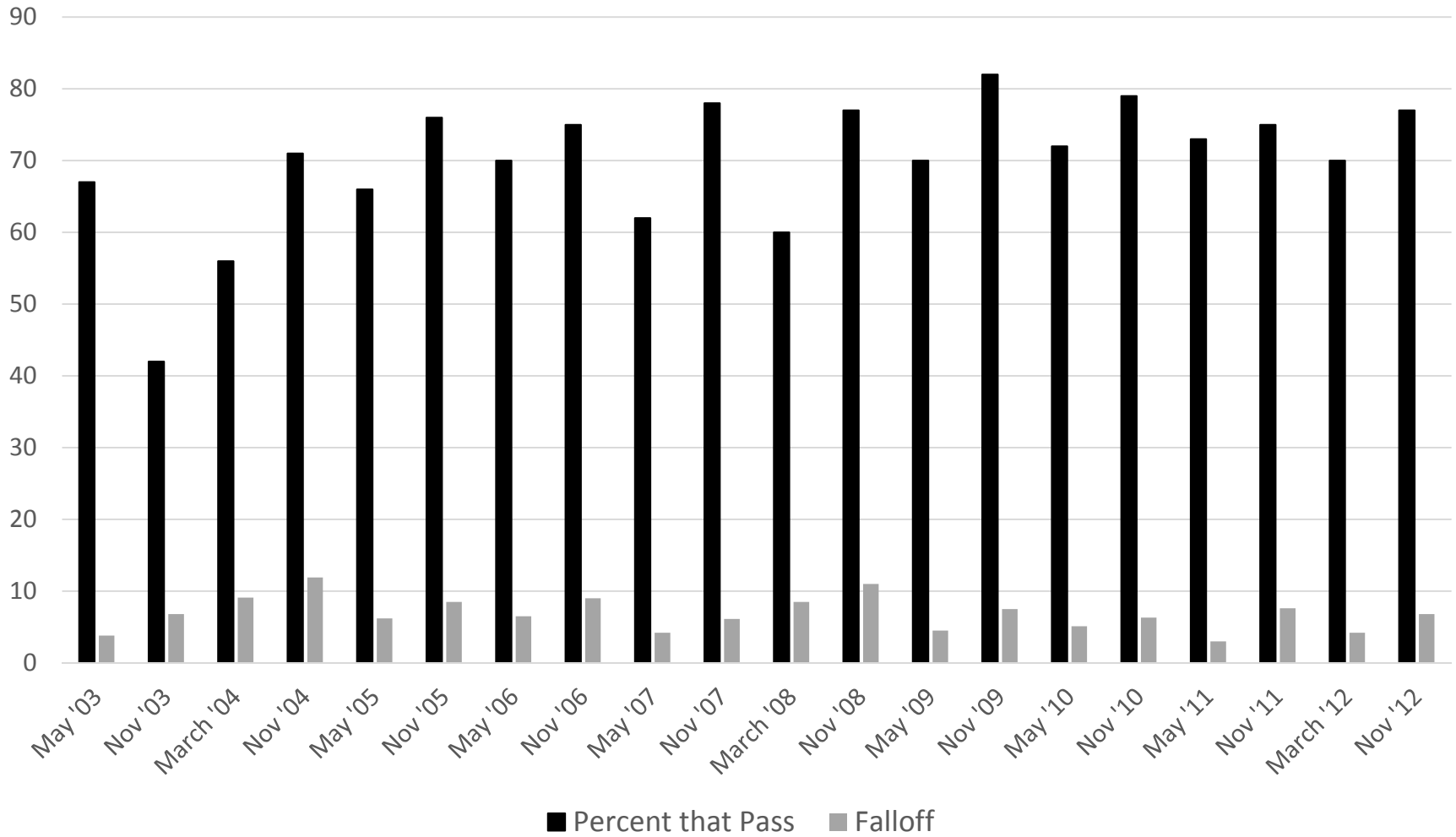


Figure 2: Percentage that Pass and Falloff





**TABLE 3**  
**Dependent Variable : Falloff = (1-Referendum Votes/Ballots)\*100**

Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)
Number of Preceding Referenda	-0.018 (0.011)	-0.096** (0.032)	-0.096** (0.032)			
Rank on Ballot (1 to 4)				-0.050 (0.040)	-0.243 (0.172)	-0.243 (0.171)
Percent of Voters over 65	-3.086** (0.864)	-4.720** (1.072)	-4.708** (1.072)	-3.068** (0.864)	-4.916** (1.815)	-5.034** (1.814)
(Percent of Voters over 65)* (Number preceding or Rank)		0.314** (0.122)	0.306** (0.123)		0.741 (0.640)	0.414 (0.648)
(Percent of Voters over 65)* (Number preceding or Rank)* (School District Referendum)			-0.032 (0.068)			1.111** (0.347)
Municipality Referendum	1.903** (0.507)	1.801** (0.508)	1.788** (0.513)	1.804** (0.503)	1.806** (0.503)	2.284** (0.568)
Township Referendum	0.035 (0.480)	0.026 (0.480)	0.015 (0.484)	-0.034 (0.477)	-0.033 (0.477)	0.416 (0.537)
Vocational School Referendum	-0.469 (0.561)	-0.457 (0.561)	-0.466 (0.563)	-0.472 (0.561)	-0.472 (0.561)	-0.003 (0.618)
County Referendum	1.486** (0.502)	1.498** (0.502)	1.490** (0.504)	1.523** (0.502)	1.523** (0.502)	1.980** (0.561)
Renewal Millage	0.248 (0.294)	0.244 (0.294)	0.245 (0.294)	0.250 (0.294)	0.250 (0.294)	0.247 (0.294)
Replacement Millage	0.918** (0.281)	0.915** (0.281)	0.916** (0.281)	0.918** (0.281)	0.918** (0.281)	0.913** (0.281)
New Millage	0.206 (0.278)	0.203 (0.278)	0.204 (0.278)	0.212 (0.278)	0.212 (0.278)	0.216 (0.278)
Election Date Fixed Effects	YES	YES	YES	YES	YES	YES
Referendum Purpose Fixed Effects	YES	YES	YES	YES	YES	YES
R-squared	0.26	0.26	0.26	0.26	0.26	0.26
Observations	7,613	7,613	7,613	7,613	7,613	7,613

Notes: Standard error is in parentheses. (\*) represents statistically significant at 10 percent level. (\*\*) represents statistically significant at 5 percent level.

**TABLE 4**  
**Dependent Variable : Referendum Passes**  
**(=1 if referendum passes and 0 if referendum fails)**

Independent Variable	(1)	(2)	(3)	(4)	(5)	(6)
Number of Preceding Referenda	0.011** (0.005)	-0.003 (0.012)	0.0003 (0.012)			
Rank on Ballot (1 to 4)				0.033** (0.018)	0.001 (0.057)	0.0004 (0.057)
Percent of Voters over 65	-0.272 (0.258)	-0.461 (0.312)	-0.450 (0.313)	-0.277 (0.257)	-0.594 (0.584)	-0.592 (0.585)
(Percent of Voters over 65)* (Number preceding or Rank)		0.044 (0.041)	0.047 (0.042)		0.129 (0.214)	0.134 (0.221)
(Percent of Voters over 65)* (Number preceding or Rank)* (School District Referendum)			-0.025 (0.028)			-0.010 (0.128)
Municipality Referendum	0.147 (0.157)	0.157 (0.157)	0.144 (0.159)	0.204 (0.155)	0.202 (0.156)	0.241 (0.173)
Township Referendum	0.417** (0.148)	0.417** (0.148)	0.406** (0.149)	0.447** (0.147)	0.447** (0.147)	0.481** (0.161)
Vocational School Referendum	-0.279* (0.167)	-0.278* (0.167)	-0.289* (0.168)	-0.279* (0.167)	-0.279* (0.167)	-0.239 (0.185)
County Referendum	0.234 (0.160)	0.234 (0.160)	0.226 (0.161)	0.218 (0.160)	0.217 (0.160)	0.254 (0.175)
Renewal Millage	1.113** (0.090)	1.112** (0.090)	1.113** (0.090)	1.113** (0.090)	1.113** (0.090)	1.113** (0.090)
Replacement Millage	0.386** (0.082)	0.385** (0.082)	0.386** (0.082)	0.386** (0.082)	0.387** (0.082)	0.386** (0.082)
New Millage	-0.935** (0.083)	-0.936** (0.083)	-0.935** (0.083)	-0.937** (0.083)	-0.936** (0.083)	-0.936** (0.083)
Election Date Fixed Effects	YES	YES	YES	YES	YES	YES
Referendum Purpose Fixed Effects	YES	YES	YES	YES	YES	YES
R-squared	0.37	0.37	0.37	0.37	0.37	0.37
Observations	10,245	10,245	10,245	10,245	10,245	10,245

Notes: Standard error is in parentheses. (\*) represents statistically significant at 10 percent level. (\*\*) represents statistically significant at 5 percent level.