Political Uncertainty and Public Financing Costs: Evidence from U.S. Gubernatorial Elections and Municipal Bond Markets*

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Abstract

This paper investigates the impact of political uncertainty induced by U.S. gubernatorial elections on borrowing costs of public debt, measured by yields of municipal bonds. We find that yield of municipal bonds sharply increase by six to eight basis points prior to elections and then reverse after elections. The impact of elections is more pronounced during economic downturns, in elections with less predictable outcomes, and among states with more outstanding debt. Several state institutions, such as GAAP-budgeting, spending limit and tax-raise limit, help to mitigate the adverse impact of political uncertainty. Evidence from detailed transactions of municipal bonds suggests that declining demand due to investor aversion to political uncertainty is the driving force behind the escalated yield prior to elections. Our findings suggest that investors are averse to political uncertainty and demand a compensation for bearing this risk.

Key Words: Political Uncertainty; Elections; Public Financing Costs; Municipal Bonds

JEL Codes: G12, G18, G28

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1 Introduction

At the end of 2010 fiscal year, the U.S. federal, state, and local public debts outstanding are US$15.41 trillion, US$1.10 trillion, and US$1.75 trillion, respectively.[1] Given the sheer size of public debts, their financing costs are fundamentally important. What determines public financing costs? Under the standard framework of fixed-income securities, the cost of debt financing is determined by an issuing entity's financial strength, as well as liquidity and liquidity risk of an issue. For a subset of tax-exempted bonds, tax and tax risk directly affect yield.[2] Recently, Pastor and Veronesi (2011 and 2012) suggest that political uncertainty affect equilibrium asset prices. Motivated by a burgeoning body of research that studies national elections and corporate investment dyanamics (Boutchkova, Doshi, Durnev, and Molchanov 2011; Durnev 2010; Julio and Yook 2011 and 2012), we use U.S. gubernatorial elections and municipal bond markets as our empirical setting, and study the impact of political uncertainty - the uncertainty about outcomes of gubernatorial elections, elected officials' preference for economic policies, and their likely course of policy actions - on public financing costs, measured by offering yields of municipal bonds.

U.S. gubernatorial election is an ideal laboratory to study political uncertainty for a number of reasons. First, gubernatorial elections matter for the state-economy. The United States Constitution grants state governments significant power in enacting and changing statutes and policies that directly affect a state's economy.[3] Through the democratic transition process, leaders with potentially different policy preferences are elected. Thus gubernatorial elections introduce political uncertainties about a wide variety of policies, and many of these directly or indirectly affect public debt financing costs. Second, the timing of gubernatorial elections is predetermined and not affected by general economic conditions. Therefore, the empirical framework at least partially overcome potential endogeneity associated with political uncertainty and the state of the economy.

[1] State and local government debts outstanding data are obtained from the U.S. Census Bureau and the federal debt outstanding is obtained from the Bureau of the Public Debt under the U.S. Department of the Treasury.

[2] Duffie and Singleton (1999) provide a general framework to study contingent claims subject to default risk. Duffie, Pedersen, and Singleton (2003) apply such a framework to study Russian sovereign bonds. Novy-Marx and Rauh (2012) study state fiscal imbalance on muni bond yields during the recent financial crisis. A number of papers highlight the demand-side induced liquidity effect on yields of U.S. and U.K. government bonds, including Greenwood and Vayanos (2010), and Krishnamurthy and Vissing-Jørgensen (2012). Wang, Wu, and Zhang (2008) document large liquidity premium of muni bond yield. Key papers studying tax and tax risk of muni bond yields include Trczinka (1982), Green (1993), Chalmers (1998), Ang, Bhansali, and Xing (2010), and Longstaff (2011), among others.

[3] A state's governor is essentially "an executive in a small open economy without a central bank." (Peltzman, 1987). Despite a governor's limited power affecting economy, as compared to that of the President, "in the organizational chart of American federal system, governors and presidents share similar power of appointment, budget making, etc.".

Third, In the U.S., the vast marjority of states hold gubernatorial elections on a rotating basis every four years. Such an arrangement creates a natural treatment sample and a control sample whenever an election takes place. Therefore, our empirical identification strategy exploits both the cross-state variation due to elections in a given year, and the within-state variation due to elections over time in a difference-in-difference framework. Finally, focusing on gubernatorial elections within a country allows us to have a relatively homogeneous group of treatment and control samples because general level of economic development, monetary policy, and the function of capital marekts are same across states.

In this paper, we focus on municipal bonds, the primary source of state and local public debts. We first examine the impact of elections on offering yield of municipal bonds. We find that the yields of municipal bonds issued in the period prior to elections sharply increase by about six to eight basis points (significant at the 1% level) compared with that of bonds issued in non-election period. The effect is economically large. To put its economic magnitude into perspective, it is informative to compare the yield differences due to other commonly discussed bond features. For instance, the average yield difference between investment-grade and high-yield municipal bonds is 6 basis points, and the yield difference between general obligation bonds and non-general-obligation bonds is about 12 basis points.

Guided by theoretical predictions in Pastor and Veronesi (2012), we explore how the impact of political uncertainty on public financing costs varies over economic conditions. We then ask, for municipal bonds, how political uncertainty, interacting with local economic conditions, affects public debt financing costs. To answer this question, we explore a source of within-state variations by differentiating elections coincident with local economy's expansions from elections coincident with local economy's contractions. Consistent with the theoretical model's predictions, we find that political uncertainty has a particularly large effect on public financing costs during downturns of the economy. For example, for municipal bonds issued during elections coincident with economic contractions, the offering yield is about 7 to 18 basis points higher than that for bonds issued during election periods coincident with economic expansions.

To deepen our analysis, we further explore impact of political uncertainty on public financing costs by exploiting variation in the degree of political uncertainty induced by elections across states and overtime. The first source of variation is the predictability of outcomes of an election.

Using a novel dataset on polls of voters prior to gubernatorial elections, we collect the fraction of swing vote, which captures uncertainty associated with an election's outcomes. In addition, we distinguish elections in which incumbent are eligible to re-election and elections in which incumbent face term limit or retirement. As noted by Ansolabehere and Snyder (2002), incumbency advantage is an important predictor of any executive and legislative election's outcomes. An election with incumbent facing term-limit and being ineligible for re-election introduces more uncertainty than an election with incumbent running for re-election. Our results unequivocally suggest that elections with less predictable outcomes have larger impact on public financing costs.

The second source of variation comes from the status of state government finance. In particular, we focus on government debt outstanding to GDP ratios. When the debt/GDP ratio is higher within a state, potential policy changes have greater impact on the ability of a state to serve its debt obligations. Therefore, the marginal impact of political uncertainty induced by an election on offering yields is expected to be stronger. Our estimate shows that, for any state, when an election coincides with high leverage (i.e., debt/GDP ratio above its historical median debt/GDP ratio), the impact of election on its public financing costs is about twice as large as an election that coincides with low leverage (i.e., debt/GDP ratio below its historical median debt/GDP ratio).

The third source of variation comes from state institutions. We investigate how institutions, such as statutory restrictions on budget processes, can mitigate or exacerbate the adverse impact of political uncertainties on public debt financing costs. In the U.S., there are significant variations in fiscal and budgetary institutions across states. Moreover, these institutions are evolving, albeit slowly. We explore the interactions between political uncertainty and institutions and examine how such interactions affect government public debt borrowing costs. Considerable evidence suggests that the adoption of generally accepted accounting principles (GAAP) in the government budgeting process, and the implementation of spending-raise limit, and tax-raise limit significantly ameliorate impact of political uncertainty on government public debt financing costs during election periods. For instance, adoption of GAAP-based budgeting reduces financing costs by 3.6 basis points, enactment of spending-raise limit reduces financing costs by 4.3 basis points, and the implementation of tax-raise limit reduces financing costs by 2.7 basis points during election periods.

Finally, we explore mechanisms through which political election affect municipal bonds. One challenge associated with our empirical design is the endogeneity of issuance time. An issuer may

postpone the issuance of bonds until the completeness of elections in order to reduce the exposure to political uncertainty. To investigate whether this endogenous timing of bond issuance is driving our results, we examine the seasoned bonds traded in the secondary market since they are not subject to the issuer's timing decisions. Using a set of state-level secondary market bond index yields, we obtain remarkably similar evidence; the yield of the state-level bond index sharply increases prior to elections and then drops after elections. Therefore, we conclude that our results cannot simply be attributed to the endogenous timing of bond issuance.

Another potential explanation is the "opportunistic political cycle" hypothesis (Nordhaus, 1975). This hypothesis suggests that incumbents have incentives to adopt expansionary policies financed by debt before elections to maximize their probability to win re-elections. These policies contribute to short-term economic prosperity but may jeopardize the health of public finance and hurt the long-term economic growth and stability. Therefore, bonds issued during the election periods are more likely related to the opportunistic behavior of incumbents and consequently are associated with higher premium. To examine this hypothesis, we study a large set of state policy instruments, and find little evidence that they vary over election cycles. Overall, our empirical evidence provides little support to the opportunistic political cycle hypothesis in the context of U.S. gubernatorial elections.

To lend additional support for investor's aversion to political uncertainty, we consider their trading behavior. Uncertainty-averse investors are less willing to purchase municipal bonds from a state prior to an election and demand higher offering yields. Using detailed secondary market municipal bond transaction data from the Municipal Security Rulemaking Board (MSRB), we test this hypothesis. As expected, we find the number of net buy orders, defined as the number of customer buy orders minus the number of customer sell orders, decreases by 25.6% (t-statistics = 2.53) prior to elections. Overall, our evidence suggests that investor's aversion to political uncertainty and consequent demand for risk premium compensation are the driving forces behind the escalated offering yield during election periods.

Despite its theoretical foundation and plenty of anecdotal yet well-publicized incidences, relating political uncertainty to public debt financing costs is a challenging endeavor for several reasons.[4]

[4]There are many examples. The quote from Standard and Poor's press release on the U.S. downgrade (August 5, 2011) is perhaps the most well-known one. Recently, in a credit assessment of major Asian economies, Standard and Poor's said that "one thing that is specific for Thailand, if not for political uncertainty Thailand's rating may

First, it is difficult to identify, on an *ex ante* basis, what constitutes "political uncertainty." Political uncertainty is not directly observable, and it affects financial market mainly through investors' perceptions. Second, an observed political event or political outcome, labeling as political uncertainty *ex post*, is usually intricately associated with changes in economic fundamentals, which may collectively affect government public debt financing costs. For example, many intuitive measures of political uncertainty, such as changes of controlling political party, are shown to be related to economic conditions (Kramer 1971; Hibbs 1977). Finally, marginal costs of government financing are not easily observable. Existing state-level fiscal and financial statistics tabulate interest cost for all existing debts on the balance sheet, rather than the marginal cost of newly issued debt. We overcome these challenges by exploiting the cross-state variation in the timing of gubernatorial elections to identify political uncertainty, aided by the relatively homogeneous legal, political, and economic systems across the states.

The empirical identification strategy employed here is built upon prior literature that investigates how national elections across countries impact stock return volatilities (Boutchkova, Doshi, Durnev, and Molchanov 2012), corporate investment sensitivities to stock prices (Durnev 2010), corporate investment (Julio and Yook 2012), and cross-border capital flows (Julio and Yook 2011). Comparing our own study with international studies, we want to point out that it is not obvious that political uncertainty affects government public debt financing costs when the underlying political system is, like the one we study here, mature and well-developed.[5] Therefore, the findings in this paper are also of interest to the literature on the real effect of political economy on financial markets.[6]

Our second contribution is that we identify a set of state fiscal and budgetary institutions that mitigate the adverse impact of political uncertainty on public debt financing costs. Some prominent examples include the adoption of Generally Accepted Accounting Principles (GAAP) in the government budgeting process and the implementation of spending limits and tax-raise limits in

be higher because the other ratios are quite strong" (March 12, 2012).

[5] For a related discussion, see Akhmedov and Zhuravskaya (2004). These authors indicate that a mature democratic political system is a countervailing force against politicians' opportunistic behaviors. Their more general insight is that, together with other determinants, the stage of a political system's development may codetermine outcomes from the political system.

[6] Another stream of research studies political cycles and stock returns (Santa-Clara and Valkanov, 2003) and shows that government spending affects firm performance over political cycles (see, Cohen, Coval, and Malloy, 2011; and Belo, Gala, and Li, 2013)

a state's budgeting process. There is a large body of literature examining the interaction between institutions and the real economy.[7] In view of prior studies, our findings have two implications for studies on institutions. First, by showing that political institutions mitigate or exacerbate political uncertainty, we provide a channel through which political institutions influence government public debt borrowing costs. Second, it is commonly agreed that political uncertainty arises from a political system which consists of a set of political institutions and an election process. Thus the effects of political uncertainty induced by elections operate through political institutions. Therefore, we delineate how the political election process and political institutions collectively impact the public debt financing costs.

The rest of the paper is organized as follows. Section 2 describes the sources of data and the sample construction process. Section 3 shows that political uncertainty induced by elections increases municipal bond borrowing costs. Section 4 studies political uncertainty under different economic conditions, and its impact on the offering yield. Section 5 explores variations in the degree of political uncertainty induced by elections and studies how these variations affect the impact of election on borrowing costs of municipal bonds. Section 6 identifies the mechanisms through which political uncertainty affects offering yield and discuss several alternative explanations. Section 7 presents a set of robustness checks and additional tests. Section 8 concludes.

2 Data and Summary Statistics

We collect data from various sources. The sample of newly issued municipal bonds is extracted from Municipal Bond Securities Database (MBSD). We collect seasoned municipal bonds from Bloomberg and Municipal Securities Rulemaking Board (MSRB). The gubernatorial election data are collected mainly from Wikipedia. We hand-collect state fiscal and political institutions from government publications. We further control for a large set of state macroeconomic variables. In this section, we detail our sample selection and data collection procedure. Appendix A provides definition, construction and data source of our variables.

[7] The literature is too large to summarize here. For instance, prior studies examine how political elections impact economic policy choices (Besley and Case, 1995); how the lack of political competition leads to policies that hinder economic growth (Besley, Persson, and Sturm, 2010); how fiscal institutions affect the speed of adjustment to fiscal shocks (Poterba, 1994); how fiscal institutions affect municipal bonds secondary market quoted yields (Poterba and Rueben, 1999); how corruption impacts municipal borrowing costs (Butler, Fauver, and Mortal, 2010); and how fiscal imbalance impacts the borrowing cost of municipal bonds (Capeci, 1994; Novy-Marx and Rauh, 2012).

2.1 Municipal bond data

We first study newly issued municipal bonds by extracting a sample of municipal bonds issued between 1990 to 2010 from Mergent's Municipal Bond Securities Database (MBSD). The basic unit of an observation in MBSD is tranche. Usually, multiple tranches with different maturity dates, coupon rates, offering yields are grouped into one issue. Tranches of an issue share the same underlying issuer, underwriting syndicate, and offering date. Similar to the common practice in the studies of syndicated loans, we construct issue-level attributes by aggregating tranche-level characteristics.[8]

MBSD only provides the most recent bond ratings as of December 2010 (the vintage of our database), rather the ratings at the time of issuance. With the MBSD sample, we identify a rating as an original rating if the rating date is prior to or coincides with the offering date. We further augment MBSD data with rating information from the Global Public Finance Database from the Security Data Corporation (SDC). We match the MBSD with the SDC using the issuer's CUSIP, bond offering date, bond offering amount, and the states of issuers. To increase our sample size, we combine three major rating agencies' ratings in the following order: Moody's, S&P's, and Fitch's. If rating information is still not available, the bond is coded as "not rated".[9] We only include tax-exempt municipal bonds and exclude bonds subject to state and/or federal tax. We also exclude Build American Bonds (BAB), anticipation notes, certificates, and other types of non-standard bonds. Our final sample includes $121,503$ issues.[10]

Second, we study seasoned bonds traded in secondary markets. Bloomberg provides yields of state-level municipal bond indices (i.e., Fair Value Municipal Bond Index) of different maturities, ranging from 3-month to 30-year. For an index to be included in our sample, we require it to have consecutive monthly time series in our sample period. This procedure retains indices from 19 states

[8] Specifically, for continuous variables, such as offering yield, coupon rate, and maturity, we calculate a dollar value weighted average. For categorical variables, such as rating and capital purpose, we identify an issue's attributes according to the tranche with the largest dollar amount with non-missing information.

[9] We contact all three major rating agencies to obtain historcal ratings, and we were informed that none of the rating agencies maintains a complete record of historical ratings before 2009.

[10] We do not separately analyze state and local debts for several reasons. First, state government policies affect local government fiscal conditions. Second, despite local government's autonomy, in some cases, state government provides subtle and implicit guarantee to local government's debt. For example, in a recent release of credit rating criteria, Standard and Poor's states that "a local government's ability and willingness to make fiscal adjustments and its legal and political relationships with higher levels of government can be more important to its ability to meet debt service than its economic trends or financial position." (Previdi et al. 2012)

with maturities of 1-, 5-, 10-, and 30-year throughout the sample period from 1996 to 2010.[11]

We also examine the transactions of municipal bonds in secondary markets. From the Municipal Security Rulemaking Board (MSRB), we obtain trade by trade municipal bond transaction data from January 1999 to June 2010. The dataset provides a detailed breakdown of the type of transactions - customer transactions versus interdealer transactions - and it records the direction of transactions - buy versus sell trades. For each state, we estimate monthly total number of transactions as well as the number of net buys.

2.2 Election data

We hand-collect data on U.S. gubernatorial elections from various sources. The primary source of election data is Wikipedia. We scrutinize the quality of the data by cross-referencing information from Wikipedia with other sources, including state election commission websites, CNN, and Factiva newspaper archives. An interesting feature of U.S. gubernatorial election is that the vast majority of the states hold gubernatorial elections on a rotation basis over four years. For example, 36 states held elections in 1990, 3 states in 1991, 12 states in 1992, and 2 states in 1993.[12] The exceptions are New Hampshire and Vermont, where elections take place every two years.[13]

We place each bond issue between two adjacent election dates: the election immediately before the bond's offering date, and the election immediately after the bond's offering date.[14] We define a bond as election-affected if the bond is issued during the "election period." Our main definition of the election period is the period before the election date but after the fiscal year ending date during the election year. With few exceptions, most states have fiscal year endings in June. The fiscal year of New York ends in March, that of Texas ends in August, and those of Alabama and Michigan end in September. Almost all elections take place at the beginning of November during

[11] However, we do not require the indices to share the same starting date. We only require them to have no missing monthly observations. The sample of states include CA, CT, FL, GA, IL, MA, MD, MI, MN, NC, NJ, NY, OH, PA, SC, TX, VA, WA, and WI. Except CT, VA, WA, and WI, the sample of state-level muni indices starts in 01/1996. CT, VA, WA, and WI start coverage in 08/1996, 10/1996, 03/1998, and 04/1997, respectively.

[12] During our sample period, there are only two special elections: California in 2003 and Utah in 2008. Each year gubernatorial elections take place among a fraction of the 50 states in the U.S. For most states, elections take place every four years.

[13] Rhode Island had two-year gubernatorial terms until 1994, and four-year terms afterward. Utah held a special election in 2008, followed by a regular election in 2010. California had a regular election in 2002, followed by a special recall election in 2003.

[14] From 1990 to 2010, there are 299 elections. After merged with our bond sample, we identify 298 elections. South Dakota didn't issue bonds in 1990 although election took place.

the election year, with the sole exception of Louisiana in 1999.[15] In summary, our election period is mainly defined as the period between July and October during an election year.

We also experiment with different definitions of the election period. For example, we define the election period as six months before the election, or all months before the election date in the same calendar year (i.e., typically from January to October in the election year). Our results are robust to these alternative definitions of the election period.

From Polling the Nations (PTN) database, we hand-collect polling data on the U.S. gubernatorial elections from 1990 to 2010. For each election, we use the last poll prior to the election to estimate the percentage of "swing vote." Usually the poll provides a list of candidates for the election, and asks the likely voters which candidate they are likely to vote for the governor's post. If a respond states "not sure", or "don't' know", or "undecided" about the choice, we classify such a vote as a swing vote. We expect an election to be more uncertain when the percentage of swing votes is high. We are able to obtain $1,643$ polls with relevant information for 150 elections in 47 states. The percentage of swing votes ranges from 0 to 34% with a mean of 7.62%.

2.3 State institutions

We manually collect state fiscal and budgetary institutions information from scanned copies of "Budget Processes in the States," which are available from the National Association of State Budget Officers (NASBO). NASBO publishes "Budget Processes in the States" every few years since 1975. We use various issues published in 1989, 1992, 1995, 1997, 1999, 2002, and 2008 to collect several time-varying state institution features. $GAAP$ is an indicator variable taking the value of one when a state adopts Generally Accepted Accounting Principles (GAAP) in the government budgeting process, and zero otherwise. The 2008 issue of "Budget Processes in the States" also provides information on when the state legislature enacts spending limits and revenue limits. To determine the year when states adopt spending limits, revenue limits, and tax-raise limits, we cross-reference two additional sources: (1) "State Tax and Expenditure Limit (2008)" from the National Conference of State Legislatures (NCSL), and (2) fiscal institutional data provided in Poterba and Rueben

[15] During our sample period between 1990 and 2010, Louisiana conducted its "jungle primary" on October 23, 1999 and did not need to hold a "runoff election." A nonpartisan blanket primary (also known as a "top-two primary," "Louisiana primary," "Cajun primary," or "jungle primary") is a primary election in which all candidates for elected office run in the same primary regardless of political party. Under this system, the two candidates who receive the most votes advance to the next round, as in a runoff election.

(1999).

2.4 State macroeconomic variables

We take into account a number of state-level macroeconomic variables. State-level annual GDP data are obtained from the U.S. Bureau of Economic Analysis (BEA). Using the annual survey of State Government Finance provided by U.S. Census, we collect the state finance variables such as outstanding debt and capital outlay. The monthly unemployment rate is from the U.S. Bureau of Labor Statistics (BLS). The monthly leading index of economic activity are obtained from the Federal Reserve Economic Data (FRED). When appropriate, we adjust all dollar value denominated variables to the 1997 dollar value using the CPI index available from FRED.

Since our sample includes tax-exempt municipal bonds, in all of our analyses we include maturity-matched benchmark Treasury yield and the marginal tax rate. The benchmark Treasury yield is obtained from the CRSP Treasury files. Motivated by the estimates in Longstaff (2011), the marginal tax rate is calculated as the sum of the highest marginal federal income tax rate and the state income tax rate, obtained from National Bureau of Economic Research's TAXSIM.

In order to control for state credit qualities, we control for state-level credit ratings. We obtain state-level credit ratings from two sources. First, from our municipal bond sample, for each state and quarter, we define the highest bond ratings of uninsured general obligation bonds without special features as the state ratings, which we term "*implied state ratings*." Second, we collect the annually updated state ratings from the "Statistics Abstract of the United States: State and Local Government Finance and Employment" provided by the U.S. Census Bureau. We are only able to obtain state ratings between 1995 and 2009 from the U.S. Census Bureau. Since these two sets of ratings are highly correlated when they overlap, we use the quarterly implied state ratings in our regression analysis. Nevertheless, our results are robust to the alternative.

To incorporate publicly known economic information at the time of bond issuance, we match bond issues with the most recent state-level economic variables. In particular, we match each bond with one-month (one-quarter, one-annual) lagged macroeconomic variables, depending on data frequency and availability.

2.5 Descriptive statistics

Table 1 provides descriptive statistics of municipal bonds in our sample. Panel A summarizes bond issuance activities by states. In our sample period between 1990 and 2010, the state with the largest number of bond issues is Texas (11,816 issues, 9.72% of total number of issues), followed by California (9,616 issues, 7.91% of total number of issues) and New York (8,659 issues, 7.13% of total number of issues). By total dollar amount of issues, California has the largest amount ($484,341 million), closely followed by New York ($447,106 million), then by Texas ($299,466 million), Florida ($186,573 million), and Pennsylvania ($165,305 million). The total dollar amount of bond issues by these five states ($1.58 trillion) counts for 47.36% of total dollar amount of issues by all states ($3.34 trillion). On the other hand, Wyoming, Montana, South Dakota, North Dakota, and Vermont count for only 0.61% of the total dollar amount of issues by all states. In terms of average offering size per issue, Hawaii has the largest ($98.91 million), followed by New York ($51.63 million), and California ($60.37 million).

The state with the highest average offering yield (equally-weighted) is Wisconsin (5.28%), followed by Florida (5.04%) and California (4.99%). On the other hand, the state with the lowest average offering yield is Oklahoma (3.46%), followed by Nebraska (3.98%) and Connecticut (3.99%). Interestingly, municipal bonds issued by different states also differ in maturities. The state with the longest average maturity is California (212 months), followed by Florida (210 months) and Wisconsin (202 months). The state with the shortest average maturity is Oklahoma (87 months), followed by Nebraska (118 months), and North Dakota (118 months).

Panel A also summarizes some basic economic statistics by states during the period between 1990 and 2010. The state with highest outstanding debt to state gross domestic product (Debt/GDP) ratio is Rhode Island (18%), followed by Alaska (17%), and Massachusetts (16%). Three states, Tennessee, Texas, and Georgia have an outstanding debt to GDP ratio near zero. The four states with the highest unemployment rate are Alaska (6.98%), California (6.86%), and Oregon and Michigan (both 6.66%). North Dakota, South Dakota, Nebraska, Iowa, and Virginia have average unemployment rates below 4%.

Figure 1 depicts municipal bond yield over the sample period between 1990 and 2010. We report offering yield and yield spread. The yield spread, defined as the offering yield minus the maturity-

matched Treasury yield, has been increasing over the sample period, whereas the offering yield has been declining. During most of the sample period, the yield spread is negative, reflecting the tax benefits of municipal bonds. Figure 1 highlights the necessity of controlling for maturity-matched Treasury yields.

Panel A of Table 2 reports summary statistics for the variables used in our regressions. In our sample, 8% of bonds are issued during the period after the fiscal year ends and before the election ("Election Period - Fiscal"), 15% of bonds are issued in the 6 months before the election ("Election Period - 6 months"), and 25% of bonds are issued in the pre-election period but in the same calendar year as the election ("Election Period - Calendar"). Overall, 39% bonds are issued during the tenure of an incumbent governor facing term limits or retirement. The average yield of maturity-matched Treasury is 4.75%, and the mean of term spread is 1.73%.

In our sample, average yield to maturity is 4.42%, and the time to maturity ranges from 1 month to 1202 months with an average of 156 months. 47% of bonds are general obligation bonds, 18% of bonds are issued using competitive offering method. There are 46% of bonds insured, 12% with additional credit enhancement, 16% involving pre-funded arrangement. 56% of bonds are callable bonds, 39% of bonds are rollover bonds issued to refund previous bonds, and 52% of bonds are non-investment grade including not-rated bonds.[16] Overall, our sample composition is very similar to that of previous studies (Novy-Marx and Rauh 2012). We are able to obtain gross spread data for $27,193$ issues. The average of gross spread is 9.72 percent with a standard deviation of 5.58 percent.

Panel A of Table 2 also reports the summary statistics of state macroeconomics. For example, the average annual growth rate of state population is 1.01% and average unemployment rate of state is 5.55%. The bottom of Panel A reports the statistics of fiscal and political institutions. In our sample, 49% of bonds are issued by states during the period when GAAP-based budgeting is adopted, and 16%, 44%, 31%, whereas 74% of bonds are issued by states in periods when revenue, spending, debt and tax raise limits are in place.

Panel B of Table 2 summarizes the pairwise correlation coefficients of selected variables. Election period is positively related to the offering yield, with a coefficient of 0.03. G.O. bond is negatively

[16] Most municipal bonds with ratings are rated above investment grade. In our sample only 3% of bonds are rated as high-yield bonds, while 49% of bonds are not rated. In alternative specification, we control for the unrated bonds and individual rating grade, and obtain very similar results.

related to the offering yield, with a correlation coefficient of -0.25. Revenue bond is positively related to offering yield, with a correlation coefficient of 0.12. Competitive offering is negatively related to offering yield with a correlation coefficient of -0.31. Callable bond is positively related to offering yield, with a correlation coefficient of 0.48. Non-investment grade bond is positively related to yield, with a correlation coefficient of 0.11. These correlation coefficients are statistically significant at the 1% level.

3 Elections and Municipal Bond Offering Yields

This section investigates the impact of gubernatorial elections on a state's financing costs, measured by the municipal bond's offering yield. We conjecture that political elections induce uncertainty about economic policies, which in turn affects borrowing costs. Thus, investors will require a greater risk premium for municipal bonds issued by a government with an upcoming election. The hypothesis is that, for the same state, municipal bonds issued during elections demand higher yields than bonds issued during non-election periods.

3.1 Univariate evidence

Figure 2 shows that the offering yield of municipal bonds is lower than the yield from its benchmark Treasury due to tax exemption. Panel A of Figure 2 shows that the time-series evolution of municipal bond offering yield spread exhibits an inverse V-shape, with the peak occurring during the month immediately prior to the election. Specifically, the offering yield spread monotonically increases by about 34 basis points ($= (-0.08\%) - (-0.42\%)$), starting 6 months before the election and ending 1 month before the election; then the offering yield spread declines precipitously by 27 basis points ($= (-0.35\%) - (-0.08\%)$) when the election takes place. By the end of the sixth month after the election, the offering yield spread essentially reverts back to its pre-election level. Panel B of Figure 2 shows seasonal adjusted offering yield spreads. We remove potential seasonal effects in yield spreads by regressing the offering yield spreads over 12 monthly dummies. This graph shows the same pattern as in Panel A with an increase of yield spreads before the election and a drop in election month. In Panels C and D, we provide the time-series evolution of offering yield spread over calendar month during the year with an election (Panel C) and without an election

(Panel D). During the year of election (Panel C), since elections usually take place at the beginning of November, we observe an increase of offering yield spreads before the election (from April to October) and a drop when elections complete. In contrast, Panel D reveals no such pattern as in Panel C in years when there is no election. In sum, preliminary evidence suggests that offering yields of municipal bonds are higher during the election period.

Table 3 compares several characteristics of bonds issued during election periods (column 1) with characteristics of bonds issued during non-election periods (column 2), and reports the differences (column 3). Bonds issued during election periods have considerably higher offering yields than those issued during the non-election periods. The difference is about 12 basis points (t-statistics = -9.845).

Bonds issued during election periods are slightly larger issues (by about \$2 million per issue, compared to an average issue size of \$27 million during the non-election period), have slightly longer maturities (by 3 months), and incur higher issuance costs measured by the gross spreads (by about 23 basis points). However, municipal bonds issued during election periods do not have lower ratings. In addition, bonds issued during election periods are slightly more likely to be general obligation (GO) bonds, and bonds with insurance features, but less likely to be associated with additional credit enhancement.[17]

3.2 Regression models and empirical results

We use multivariate regression to study the impact of election on bond yields while controlling for other determinants. The main regression model is specified as follows,

$$y_{ijt} = \alpha_j + \gamma_t + m_k + \beta \times Election_{jt} + \sum \boldsymbol{\varphi}_i \mathbf{X}_i + \sum \boldsymbol{\delta}_j \mathbf{S}_{j,t} + \varepsilon_{ijt} \tag{1}$$

where i indexes municipal bond issues, j indexes states, and t indexes year. The dependent variable, offering yield (y_{ijt}), reflects the financing costs of municipal bond issues.

The set of controls are motivated by Collin-Dufresne, Goldstein, and Martin (2001). Among the dependent variables, $\mathbf{S}_{j,t}$ is a vector of state-specific characteristics, and $\mathbf{X}_i$ is a vector of

[17] Additional credit enhancement is an indicator that takes a value of one if there is additional credit enhancement in the contract of the bond issuance, and is zero otherwise. Credit enhancements include but are not limited to collateral purchase program, guaranteed investment contract, loan purchase agreement, and credit enhancement/intercept program provided by cities or school districts.

bond-specific characteristics. Specifically, we control for the marginal income tax rates (the sum of the highest federal marginal income tax rate and the highest state marginal income tax rate), maturity-matched treasury yield, and term spread (i.e., the difference between 20-year and 1-year Treasury yields). State-level control variables include state GDP and population growth, and state government financial conditions. Bond-level characteristic variables include maturity, offering method, ratings, and credit enhancement, among others. All regression models include state fixed-effects (α_j), year fixed-effects (γ_t) and month fixed effects m_k, for $k = 1, 2, ..., 11$.

The main independent variable of interest is $Election_{jt}$, the election period indicator variable, which takes a value of one during the election period, and zero otherwise. The coefficient estimate of the election dummy, β, captures the *change in offering yields* during the election period, after controlling for state-level and bond-issue-level characteristics. Following Petersen (2009), we compute heteroskedasticity-consistent standard errors clustered by state.[18]

One econometric issue is worth noting. There are substantial variations in the number of bonds issued across states. For example, in our sample, Texas issues 11,816 municipal bonds with a total dollar value of US$299,466 million, whereas Delaware only issues 157 bonds with a total dollar value of US$7,312 million. An ordinary least squares (OLS) regression assigns an equal weight to each bond issuance, regardless of the frequency of bond issues per state. Consequently, an OLS regression lacks the power to identify political uncertainty's impact on the financing costs of issuer. To better reflect the issuance activities by states and better measure the economic magnitude, we implement weighted least squares (WLS) regressions. In these WLS regressions, we use the probability of each state entering our sample as the weight. In other words, issuance activity by state is the weight in these regressions. We also consider the feasible generalized least square regression (FGLS) and ordinary least squares (OLS) regression as additional robustness checks. Consistent with earlier univariate evidence, results are robust to these alternatives.

Table 4 studies the impact of elections on municipal bond's offering yields. All specifications include state-, month-, and year-fixed effects. We further include the capital purpose fixed effect in all regressions, except the regression in column (6), where we examine a subset of "rollover bonds."

Column (1) reports the results from the baseline model, which includes the maturity-matched

[18] We also experiment with calculating standard errors based on two-way clustering by year and state. Standard errors based on two-way clustering are slightly smaller then one-way clustering by state. To be conservative, we report results based on standard errors computed from one-way clustering.

benchmark Treasury yield, marginal tax rate, and term spread as controls. The coefficient estimate of the main variable of interest, *Election*, is 0.081 (t-statistics = 3.46). That is, the average offering yield of municipal bonds issued during an election period is 8.1 basis points higher than that of bonds issued during non-election periods. As one expects, the benchmark Treasury yield is the most important determinant of municipal bond offering yield. A one basis point increase in the benchmark Treasury yield translates into 0.951 basis point increase in the municipal bond yield.

Besley and Case (1995) show that governors who are ineligible for re-election (i.e., "term limited") behave differently than governors who can be re-elected, and term limits impact state taxes, spending, and public transfers. Motivated by their work, we include an indicator variable, *Term Limits*, in the baseline model. The indicator variable takes a value of one if the incumbent governor faces a term limit, and zero otherwise. The coefficient estimate of *Term Limits* is 0.033 (t-statistics = 2.31), which implies that municipal bonds issued during a governor's last term in office pay yields that are 3.3 basis points higher than his first term in office.

In columns (2) to (3), we sequentially include additional variables of bond characteristics and state macroeconomic conditions. These additional variables only marginally attenuate the effect of elections on municipal bond offering yields: the impact ranges from 6.8 basis points (column 2) to 7.0 basis points (column 3). These point estimates are economically large. To provide a scale for these results, one can relate yield to some commonly observed bond characteristics. For example, the average yield difference between investment-grade and high-yield municipal bonds is 6 basis points, and the average yield difference between a general obligation bond and a non-general obligation bond is about 12 basis point.

In column (2), after controlling for bond characteristics, *Term Spread* is always positively related to offering yield and is statistically significant at the 1% level. In general, the coefficient estimates are statistically significant and yield expected signs. For example, bonds with longer maturities have higher yields, and larger issues have lower yields. General obligation (GO) bonds have lower yields, while callable bonds have higher yields. Insured bonds, bonds with additional credit enhancement features, investment-grade bonds, and bond offered through competitive methods have lower yields.[19]

[19] In unreported regressions, we estimate the marginal effect of bond ratings in a model including dummies of non-rated bonds and high-yield bonds. The difference of offering yield between high-yield and investment grade bonds is 6 basis points, and the difference between non-rated bonds and high-yield bonds is 11 basis points.

As column (3) shows, except for the state-level leading economic index, most other state-level macroeconomic variables are not statistically significant in determining offering yields. The state-level leading economic index is significantly negatively related to offering yields, which is consistent with the idea that a state with a better economic outlook can borrow at a lower cost. A one standard deviation increase in the leading economic index (1.44) reduces the offering yield by 11 basis points. A state with a larger fraction of government debt outstanding to state gross domestic product (Debt/GDP ratio) pays higher borrowing cost. A one standard deviation increase (about 0.025) in the government debt to total GDP ratio demands 10 basis points higher offering yields. Higher state ratings reduce the offering yields. A one notch increase of the state's rating, from AA+ to AAA, reduces the offering yield by 4.41 basis points.[20,21]

In column (4), we repeat the specifications from column (3), but include only a subsample of general obligation (GO) bonds. Because general obligation bond is backed by a state or local government's pledge to use all legally available resources, including tax revenues, to repay bond holders, market perceives it as having little default risk. The point estimate of election on offering yield is 0.069 (t-statistics = 3.73).

In column (5), we only include a subsample of insured bonds. In the event of default by the issuers (i.e., failure to pay interest and/or principal on time), investors of insured municipal bonds receive "unconditional, irrevocable" and "100% of interest and principal of the issue" (Nanda and Singh, 2004). Therefore, it is fair to say that insured bonds are usually perceived to be subject to a very low default risk.[22] The point estimate of election on offering yield is 0.066 (t-statistics = 6.55), which is again similar to those obtained from previous specifications.

Taken evidence in columns (4) and (5) together, to the extent that default risk is small among general obligation bond, or it is muted by bond insurance, the increase in municipal bond offering

[20] To put the comparison on an equal footing, we estimate the marginal effect of a one notch increase in the state's rating on yield from a regression model including only the state-rating fixed effect.

[21] In an unreported regression, we also experiment with other state-level attributes, such as political integrity, education, and newspaper circulation, among others. These variables exhibit little time-series variation. Therefore, they are not statistically significant once we include the state fixed effect.

[22] We say "usually" because there are episodes when municipal bond insurance provided by financial guarantors was at best worthless, if not a "liability." For example, during the recent financial crisis, between 2007 and 2009, there is an inversion of yields between insured and uninsured municipal bonds. See Shenai, Cohen, and Bergstresser (2010) for a discussion of the phenomenon. Novy-Marx and Rauh (2012) also provide some confirming evidence. Bergstresser, Cohen, and Shenai (2011) provide an alternative view of the roles of financial guarantors. Their analysis suggests that bond insurers seem to be able to identify bonds of better quality. In line with their estimates, about 47% of the municipal bonds in our sample are insured.

yields during the election period is less likely to be driven by a sudden surge in the default risk.

In column (6), we focus on a subsample of "rollover bonds." Rollover bonds are issued to refund previous bond issues, which are originally issued with higher borrowing costs or would have matured. Hence, the timing of issuance is more likely to be determined by borrowing cost saving motives and the macroeconomic environment. The estimated coefficient is 0.082 (t-statistics = 6.05), which is comparable to the estimates for the full sample of municipal bonds considered in the previous regressions.

4 Economy Conditions and Impact of Elections

Having shown that political uncertainty induced by forthcoming elections increases the offering yield of municipal bonds, we examine whether the impact of election varies with economic conditions. Pastor and Veronesi (2011, 2012) provide a theoretical framework demonstrating that political uncertainty has greater impact on asset prices when the economy is in a downturn. In their models, one mechanism through which political uncertainty operates is uncertain policy changes. Uncertain policy changes are more likely to occur during economic downturns, and investors demand higher risk premiums as compensation. To summarize, our hypothesis is that the impact of political uncertainty induced by forthcoming gubernatorial elections on the public debt financing cost is more pronounced when a state's economy is in a downturn.

To test this hypothesis, we focus on the interaction between election and a state's economic conditions. Because control variables may impact offering yields differentially during a state's local economic expansions and contractions, we estimate a full-interaction model. That is, we interact economic condition with all independent variables. We are interested in examining whether economic contractions amplify the impact of political uncertainty on borrowing costs of public debt.

The empirical model is specified as follows:

$$\begin{aligned} y_{ijt} &= \alpha_j + \alpha_j' \times I_{jt} + \gamma_t + \gamma_t' \times I_{jt} + m_k + m_k' \times I_{jt} + \beta_0 \times Election_{jt} + \beta_1 \times Election_{jt} \times I_{jt} \\ &\quad + \beta_2 \times I_{jt} + \sum \boldsymbol{\varphi}_i \mathbf{X}_i + \sum \boldsymbol{\varphi}_i' \mathbf{X}_i \times I_{jt} + \sum \boldsymbol{\delta}_j \mathbf{S}_{j,t} + \sum \boldsymbol{\delta}_j' \mathbf{S}_{j,t} \times I_{jt} + \varepsilon_{ijt} \end{aligned} \tag{2}$$

where I_{jt} is an indicator variable which takes a value of one if the state's local economy is in

contraction, and zero otherwise. We are particularly interested in the coefficient β_1. A positive and significant β_1 suggests that the effect of $Election_{jt}$ during contraction is larger than the effect during expansion. For the ease of comparison, we also examine the election's impact on offering yields in expansion and contraction separately.

We consider several alternatives to identify economic expansions and contractions. First, we directly use the U.S. business cycle dating information from the National Bureau of Economic Research (NBER). We create an indicator variable that equals one if the US economy is in recession, and zero otherwise. Second, we consider the state-level unemployment rate to differentiate economic expansions and contractions. We define an expansion (and contraction) as the period when the corresponding election period average state-level unemployment rate is below (or above) the historical median unemployment within the state. Finally, we consider the state-level economic leading indices. Here, we define an expansion (and contraction) as the period when the corresponding election period average economic leading index value is above (or below) the historical median economic leading index value within the state. One advantage of using the state-level economic leading index is that it comprises a large number of state-level economic indicators, and more accurately reflects a state's economic conditions.

In Table 5, for each economic indicator, we separately estimate the impact of an election during economic expansions and contractions, and report the estimated coefficients of key variables. For instance, when using NBER business cycles to classify economic conditions, we find that the impact of *Election* on offering yields is 24.6 basis points (t-statistics = 3.86) during contractions, and 6.3 basis points (t-statistics = 4.61) during expansions. When classifying economic conditions based on state-level unemployment rates, we find that the impact of *Election x Economic Indicator* on offering yields is 9.7 basis points (t-statistics = 4.61) during contractions, and 2.5 basis points (t-statistics = 2.28) during expansions. Finally, when we classify economic conditions based on state-level economic leading indices, we find that the impact of Election on offering yields is 12.8 basis points (t-statistics = 4.21) during contractions, and 1.9 basis points (t-statistics = 0.74) during expansions. Overall, the results confirm that election's impact on offering yields is more pronounced during economic contractions.

In untabulated analyses, we find that the general economic conditions affect the impact of control variables on offering yields. For example, term spread positively affects the borrowing cost

in economic upturns but not in economic downturns; implied state ratings reduce the borrowing cost in economic downturns but not in economic upturns. The last set of observations justifies the full-interaction models, which allow the coefficients on each regressor to vary across different states of the economy.

To test the statistical significance of the differential impact of election on offering yield, we estimate a full-interaction model. The main variable of interest is *Election x Economic Indicator*. In all specifications, the interaction terms are both statistically and economically significant. The difference between the impact of Election on offering yields during contractions and expansions ranges from 7.3 basis points (column (6), based on state-level unemployment) to 18.3 basis points (column (3), based on NBER business cycles). In summary, we find considerable empirical support for the theoretical models of Pastor and Veronesi (2011, 2012).

5 Variation in Uncertainty and Impact of Elections

Analysis above shows that the election not only impacts offering yields pervasively, such an impact also varies with economic conditions. In this section, we further explore election's impact on offering yields by exploiting variation in the degree of political uncertainty induced by elections across states and overtime. To deepen our analysis, we explore three types of variations: the predictability of an election's outcomes, the status of state government finance, and the restriction of fiscal and budgetary policies embedded in the state's institutions

First, the impact of election depends on the predictability of election's outcome. A *a* highly predictable election induces little uncertainty *ceteris paribus*. We consider two *ex ante* measures that capture the predictability of election's outcome. The first measure is the fraction of swing vote prior to an election. The higher the percentage of swing vote, the more uncertain the election's outcome. The indicator variable, *Swing Vote*, takes the value of one when the percentage of swing vote in the poll is above the historical median in the state, and zero otherwise.[23] The second measure explores whether an election involves an incumbent facing term-limit. As noted by Ansolabehere and Snyder (2002), incumbency advantage is an important predictor of any executive and legislative election's outcomes. An election with incumbent facing term-limit and being ineligible for re-

[23] In unreported analysis, instead of using the binary variable, we use the continuous variable of the percentage of swing vote and obtain similar results.

election introduces more uncertainty than an election with incumbent running for re-election. The indicator variable, *Term Limits*, takes the value of one if the incumbent faces term-limit, and zero otherwise.

Second, electoral uncertainty may have a larger impact if a state's government finance is particularly sensitive to potential policy changes. To gauge the status of state financing, we consider government debt outstanding to state gross domestic product (Debt/GDP) ratio. Therefore, when the debt/GDP ratio is higher within a state, the marginal impact of political uncertainty induced by an election on offering yields is expected to be stronger, as potential policy changes have greater impact on the ability of a state to serve its debt obligations. Empirically we consider an indicator variable, *Debt/GDP Ratio*, that equals one if a state's government debt/GDP ratio is above its historical median during the election period, and zero otherwise.

Third, election's impact also depends on the state-level institutions. In the most extreme case, if the elected officials are completely restricted by existing institutions, they have little real policy making power, and an election by itself introduces little real uncertainty, regardless of how uncertain an election's outcome is. We focus on "*fiscal restrictions*" that measure the degree of restrictions on the budgeting process, including a state's adoption of Generally Accepted Accounting Principles (GAAP), revenue-raising limit, tax-raising limit, and spending-increase limit.[24] Because these institutions impose restrictions on policy changes, they may mitigate the impact of election-related political uncertainty on public debt financing costs. More specifically, the indicator variables take value of one if the state has GAAP-based budgeting, revenue-limit, spending-limit, and tax-raise-limit in place, respectively; and zero otherwise.

To test these ideas discussed above, we estimate the following regression:

$$\begin{aligned} y_{ijt} &= \alpha_j + \gamma_t + m_k + \beta_0 \times Election_{jt} + \beta_1 \times Election_{jt} \times Z_{jt} + \beta_2 \times Z_{jt} \\ &\quad + \sum \boldsymbol{\varphi}_i \mathbf{X}_i + \sum \boldsymbol{\delta}_j \mathbf{S}_{j,t} + \varepsilon_{ijt} \end{aligned} \tag{3}$$

where Z_{jt} is the state-level characteristics of interest. Our interest is β_1 , which indicates whether a particular factor that mitigates or exacerbates the impact of election on offering yields. For

[24] We also consider the limit of general obligation debt (i.e., the "debt-limit"). However, the vast majority of states adopt the debt-limit and there is little cross-sectional and time-series variation for the purpose of identification.

example, when Z_{jt} is "fiscal restriction", we expect a negative β_1; and a negative β_1 indicates that "fiscal restriction" mitigates the impact of elections on offering yields. We are also interested in the average effect of the institution on offering yield during both an election period and a non-election period, i.e., the coefficient estimate of β_2.

Column (1) from Table 6 shows that for an election with a larger fraction of swing vote, or an election with less predictable outcomes, a concurrently issued municipal bond commands 10.5 basis points higher yield (t-statistics = 3.22). This is an economically large effect. In fact, the yield difference between between high-yield bonds and investment-grade bonds in our sample is about 6 basis points.

Specification in column (2) compares offering yields of bonds issued during election period when the incumbent faces the term-limit, and offering yields of bonds issued during election period when the incumbent does not face the term-limit. As we expect, when the incumbent is not eligible for re-election and outcomes of an election become less certain, the election's impact on bond offering yields is larger by about 4.8 basis points (t-statistics = 2.07).

Specification in column (3) is a much more stringent test. It compares offering yields of bonds issued during the election period and those issued during the non-election period *in the last term of the incumbent*. When an incumbent is ineligible for re-election, offering yields of bonds issued during the election period in his last term in office increase by *additional* 1.6 basis points, compared to those issued during the non-election period in his last term. While the last estimate has the expected sign, the standard error of estimate is large.

Column (4) shows that a state with government debt/GDP ratio above its historical median faces an additional 7.6 basis points (t-statistics = 2.88) higher offering yields during the election period. Interestingly, a higher level of state government debt/GDP ratio by itself does not translate into a higher borrowing cost.

Specifications in columns (5) to (8) investigate the effect of "*fiscal restrictions*", an important component of state budgetary institution. Several interesting findings emerge. First, certain institutions influence offering yields during both election and non-election periods. One such institution is the adoption of Generally Accepted Accounting Principles (GAAP) in the budgeting process. Column (5) shows that adoption of GAAP reduces offering yields by 11.5 basis points; it also mitigates the impact of elections by additional 3.6 basis points (t-statistics = 2.04). Second, some budgetary

institutions affect municipal bond offering yields on average, but do not have an incremental impact on offering yields during the election. When the revenue limit is in place, offering yields increase by 12.9 basis points (t-statistics = 2.04). However, the revenue limit does not contribute marginally to the impact of elections on borrowing costs, as shown in column (6). In contrast, some state institutions, such as spending limit or tax-increase limit, attenuate offering yields in general, but the effects are not statistically significant. Interestingly, these restrictions have incremental effects on offering yields during elections. Specifically, a state with spending limits on average experiences about 4.3 basis points lower financing costs (t-statistics = -2.68), while a state with tax-increase limits on average pays 3.3 basis points less during the election period (t-statistics = -1.88). On balance, "*fiscal restrictions*" attenuate uncertainty induced by elections, and lower offering yields during the election period.

6 How Does Election Impact Public Financing Cost?

How does political uncertainty induced by elections affect the borrowing costs of municipal bonds? One channel envisioned by Pastor and Veronesi (2011, 2012) is that investors demand temporary compensation for bearing political uncertainty. During the election period, investors in municipal bonds are uncertain about (1) who will win the election, (2) policy preferences of the elected official and underlying political affiliates, and (3) policy effects on the economy. After an election, uncertainty about the winner of the election resolves, while uncertainty about the newly elected official's policy preferences and the impact of policies remain. The net effect is that overall political uncertainty reduces. Our empirical evidence presented so far is consistent with the theoretical models in Pastor and Veronesi (2011, 2012). However, there are other potential channels which may also explain temporary escalation of municipal bond offering yields. We will discuss these alternatives, and provide further evidence that is more consistent with an explanation based on the political uncertainty.

6.1 Elections and timing of bond issuance

The timing of election is predetermined, and issuers of municipal bonds can choose when to issue. Timing endogeneity may introduce potential bias in our estimate of election's impact on

offering yields. One scenario is that, facing uncertainty, agents choose to delay investment till the uncertainty is resolved (Bernanke, 1983; among others). Abstracting away from some important organizational and incentive differences between private and public sectors, one can argue that municipal bond issuers (i.e., end-users of the capitals) may delay issuance after the election and avoid paying higher borrowing costs. However, to the extent that we don't observe decrease in bond issuance during the election period, there might be a subtle composition effect. To understand this effect, let us assume issuers have a menu of bond issuance choices. The first group of bonds must be offered *immediately* to fulfill urgent public financing needs. Moreover, for some exogenous reasons unrelated to political uncertainty, the first group of bonds command higher offering yields. The second group of bonds should be offered but do not have to be offered immediately. The second group of bonds demand lower offering yields. In absence of election induced political uncertainty, all bonds are offered, and the average yield is the yield during the non-elecion period. During an election, however, if only first group is offered, we observe higher offering yields. Although higher offering yields still reflect political uncertainty induced distortion of public financing in terms of capital formation, they do not directly imply political uncertainty affect offering yields.

Another possibility is that political connections may distort municipal bond issuance. A politician may have *quid pro quo* relationship with certain interest groups, such as local business, underwriters, school districts, etc., that hope to issue bonds (Butler, Fauver, and Mortal 2010). The politician wants to gain or repay such a favor especially during the election period. If bonds issued under such a relationship have poor credit qualities, these bonds will demand higher offering yields when they are issued. If those "*quid pro quo* bonds" account for a larger fraction of all bonds issued during the election periods, we will again observe higher offering yields.

While such scenarios are plausible, we want to point out several observations that are inconsistent with these alternatives. First, municipal bonds issued during the election periods don't have lower credit quality based on ratings. In fact, last row from Table 3 shows that the opposite is true. Second, when we focus on a subsample of "rollover bonds" (see, column (6) of Table 4), which are less likely to be affected by the timing consideration, we find almost identical results showing the impact of election on offering yields.

Now we offer a more direct test to address these concerns. Our test examines the yields associated with the secondary market traded *seasoned bonds* that are issued *during the non-election*

period. We focus on the state-level municipal bond portfolio's yields provided by Bloomberg Fair Value Muni Index to circumvent issues related to municipal bond illiquidity.[25]

Figure 3 plots Treasury maturity-matched secondary market yield spreads associated with bond indices of different maturities around elections. Panel A depicts the time-series of market yield spreads over the election period and Panel B provides the seasonal adjusted market yield spreads. The patterns observed here are very similar to those of the Treasury maturity-matched offering yield spreads in Figure 2. Secondary market yield spreads gradually increase as elections approach, then decrease after elections. Moreover, the patterns are remarkably consistent across different maturities. Panels C and D provide the time-series evolution of secondary market yield spreads over calendar months during election years (Panel C) and non-election years (Panel D). Panel C shows an increase of yield spreads before the elections and then a drop afterward in elections. Panel D reveals no such pattern as in Panel C in years when there is no election.

Table 7 examines how elections impact the yield of the state-level municipal bond index. The regression specifications are similar to equation (1), but without bond characteristic controls. In column (1), we pool state-level municipal bond indices of different maturities, including 1-year, 5-year, 10-year, and 20-year, and run a panel regression with the dependent variable as a triplet of state-maturity-month bond index yield. To take into account the composition of the sample, we also include maturity fixed effects in the regression. The point estimate of *Election* is 0.065 (t-statistics = 2.95). That is, the state-level municipal bond index yield increases by 6.5 basis points during an election period, a magnitude comparable to our baseline estimate of 7.2 basis points, reported in Column (4) of Table 4. Columns (2) to (5) split the sample by maturities, from 1-year to 20-year. The point estimates range from 4 basis points (t-statistics = 2.27) for the 1-year bond index to 10.8 basis points (t-statistics = 3.26) for the 5-year bond index. Overall, evidence from the secondary market suggests that timing endogeneity does not explain the escalated debt financing costs prior to elections.

[25] See Green, Li, and Schurhoff (2010), Green, Hollifield, and Schurhoff (2007a, 2007b), Harris and Piwowar (2006), and Schultz (2012) for detailed discussions about the secondary market structures, transaction costs, illiquidity, and transparency of municipal bonds.

6.2 Elections and political cycles

Facing elections, incumbents have strong incentives to maximize their chance of being re-elected. Starting with Nordhaus (1975), models of political cycles suggest that incumbents may adopt policies that generate low unemployment and high economic growth prior to elections. For example, incumbents may reduce taxes and raise public expenditures, financed by public debts. However, these policies may jeopardize the health of public finance and hurt long-term economic growth and stability. Alesina (1987) points out the limitations of these models under rational expectation. In our context, if incumbent's opportunistic motives are indeed at play, after taking into account implications of these manipulative policies, rational investors may demand higher risk premiums to purchase bonds *issued* during the election period.

Several pieces of existing evidence are inconsistent with this hypothesis. First, the political cycles hypothesis does not unambiguously predict a reversal pattern of bond yields for both the newly issued bonds and the seasoned bonds around the election. Yet we observe municipal bond yield increases during the period leading up to the election and subsequently decreases precipitously in both primary and secondary markets.[26] Second, when an incumbent faces term-limit and is ineligible for re-election, there is little incentive for her to manipulate policy is to win the re-elections. Nevertheless, we find that bonds issued during the period when the incumbent facing term limit demand 3 basis point higher offering yield (see in Table 4). Third, according to the political cycles hypothesis, politicians have strong incentives to boost economic activities prior to an election, arguably more so when the election coincides with an economic downturn. Thus the impact of election on yield during the local economic downturn should be ameliorated rather than exacerbated. Our estimates from Table 5 show exactly the opposite.

To more directly test the opportunistic political cycle hypothesis, we first examine the impact of elections on state government fiscal policies using state government finance data collected from the U.S. Census Bureau. Specifically, in Appendix B, we examine whether there exists significant within-state time-series variations of state sales taxes, income and corporate taxes, government capital outlay, and debt outstanding, by comparing fiscal years prior to elections with other years. First, as shown in columns (1) to (3), we find no significant change in these policy instruments.

[26] This is in sharp contrast to the return patterns related to political cycles. Santa-Clara, and Valkanov (2003) show there is no discernable abnormal return around the windows of U.S. presidential elections.

Second, we consider how term limit affects use of these politicy instruments. Besley and Case (1995) find that state taxes and government spending increase when an incumbent democratic governor face term limit. Consistent with their study, we find state capital outlays increases when a democratic incumbent faces term limit. But again this evidence is inconsistent with the political cycle hypothesis, which suggests weaker incentive for an incumbent facing the term limit.

One may be concerned that annual data are too coarse to capture opportunistic behaviors (Akhmedov and Zhuravskaya 2004). In Appendix C, we further examine whether bond issuance increases prior to elections, using various definitions of election periods (as shown in Table 9 below). In columns (1) to (3), after taking into account the state macroecomic conditions and several fixed-effects, we find no significant change in average bond offering size during the election period. In columns (4) to (6), when we examine monthly offering amount (in logarithm) by states, we actually find offering amount decreases in response to forthcoming elections. In principle, the last finding is consistent with evidence in Julio and Yook (2012), who show similar decrease in private investment prior to national elections.

Overall, we find little evidence that supports the political cycle hypothesis in the context of U.S. gubernatorial elections. While our results seem disappointing, they are consistent with prior empirical literature on the opportunistic political cycle hypothesis in the democratic countries. For example, Besley and Case (2003) find similar evidence after taking into account state fixed-effects (see Table 13 in particular). In fact, Peltzman (1992) concludes "... [in the U.S.] voters are not easily 'bought off' by election year spending. Spending just prior to an election is even more poisonous politically than in other periods."

6.3 Aversion to political uncertainty

The basic premise of Pastor and Veronesi (2011, 2012) is that investors are averse to political uncertainty and demand compensation for bearing it. Our evidence so far suggests investors indeed demand high premium for bearing such an uncertainty. In this subsection, by exploring secondary market trading behaviors of municipal bond investors, we provide further evidence that investors are averse to political uncertainty induced by elections.

In the prototype model of Bernanke (1983), facing escalated uncertainty, a firm exercises the option to wait. Similarly, encountering uncertainty, an investor may choose to reduce market par-

ticipation. Sidelined investors create capital immobility (Duffie, 2010), especially for a fragmented, search-based over the counter (OTC) market like that for municipal bonds. Capital immobility generates temporary liquidity shock in the form of liquidity shortfall. Those investors who step in and provide liquidity demand extra compensation. This idea is particularly relevant for investors of municipal bonds. A key ingredient of the model in Bernanke (1983) is irreversible investment, which makes the option to wait valuable. For investors of municipal bond, because trading costs associated with municipal bonds are notoriously high, a similar argument applies.

We test this channel using detailed trade by trade secondary market transaction data from MSRB. One advantage of this dataset is that it provides a detailed breakdown of the type of transactions - customer transactions versus interdealer transactions - and it records the direction of transactions - buy versus sell trades. For each bond (i) issued by state (j) traded during month (t), we can construct the number of total customer trades ($\#TotalTrades_{ijt}$), and the number of net customer buys ($\#NetBuys_{ijt}$):

$$\begin{aligned} \#TotalTrades_{ijt} &= \#Buy\ Trades_{ijt} + \#Sell\ Trades_{ijt} \\ \#NetBuys_{ijt} &= \#Buy\ Trades_{ijt} - \#Sell\ Trades_{ijt} \end{aligned} \tag{4}$$

We use the number of net customer buys to measure demand, but we also consider the number of total customer trades for comparison. To reduce idiosyncratic noise associated with individual bond trading, we aggregate the number of total customer trades and the number of net customer buys at the state level, and construct state-level monthly series of total customer trades ($\#TotalTrades_{jt}$), and the number of net customer buys ($\#NetBuys_{jt}$).

Our regression model is specified as,

$$y_{jt} = \alpha_j + \gamma_t + m_k + \beta \times Election_{jt} + \sum \boldsymbol{\delta}_j \mathbf{S}_{j,t} + \varepsilon_{ijt} \tag{5}$$

where the dependent variables are the total number of customer trades ($\#TotalTrades$) and the number of net customer buys ($\#NetBuys$) of the municipal bonds issued by a state within a month. The variable of interest is *Election*, which estimates election's impact on trading in the secondary market.

Schultz (2012) makes a distinction between transactions of *newly issued bonds* and *seasoned bonds*. In practice, if a bond is issued at least thirty days earlier, it is considered as a seasoned bond; otherwise, it is considered as a newly issued bond. For a newly issued bond, underwriters and dealers contact the potential buyers to place a bond. Thus most of the customer transactions of a newly issued bond are seller-initiated. To trace out the demand of a newly issued bond, we need to observe the number of all potential customers contacted by underwriters and dealers, not just those customers who decide to participate in the offering process (and recorded in the dataset). The reported transactions of newly issued bonds are "censored" in this sense, and do not precisely reflect investors' demand. After initial placement of a bond, investors usually hold it for long-term investment purposes. Thus most of the customer transactions of a seasoned bond are buyer-initiated. For a seasoned bond already traded on the secondary market, dealers stand by and make the market by taking necessary inventory positions. A complete set of records of customer buys and sells allows us to identify the "uncensored" demand. In summary, an important conceptual distinction exists between a newly issued bond and a seasoned bond. To identify investors' demand, we naturally focus on seasoned bond trading, although we report the trading of newly issued bonds and the trading of all bonds for comparison.

Table 8 compares the number of total trades as well as the number of net buys during election periods with non-election periods. The number of total trades, as well as the number of net buys, significantly decreases during the election period. These estimates are statistically significant at the 5% level or better, and the economic magnitude is also large. For the full sample of newly issued bonds and seasoned bonds, the number of total trades decreases by 6.5% (= 4.57/70.58, where 70.58 is the number of total trades during non-election periods), while the number of net buys decreases by 13.7% (= 4.335/31.58, where 31.58 is the number of net buys in hundreds during non-election periods). The effect is much stronger among seasoned bonds. The number of net buys decreases by 25.6% (= 4.755/18.55, where 18.55 is the number of net buys in hundreds during non-election periods). As one expects, the effect is much harder to detect among newly issued bonds. For instance, the number of net buys decreases approximately 1% (= 0.014/1.33, where 1.33 is the number of net buys in hundreds of newly issued bonds during non-election periods).

In summary, evidence from the secondary market transactions suggests that the demand due to uncertainty aversion is the driving force of the escalated offering yields during the election period.

7 Robustness Checks and Other Tests

We conduct numerous robustness checks. The first set of robustness checks uses different definitions of election periods. The results are provided in Table 9. The first column (1) reproduces our main results from Table 4. In column (2), we expand the election period window from six months before the election (inclusive) to one month before the election (inclusive). Since in most states elections take place in November, under this definition, the election period runs from to May 1 to October 31. The point estimate of *Election* is 0.057 (t-statistics = 3.96). In column (3), we expand the election period window from January 1 of the election year to one month before the election (inclusive). The point estimate of *Election* is 0.026 (t-statistics = 1.72). Taken together, columns (1) to (3) show that the longer the window of the election period, the lower the impact of the election on offering yields. In column (4), we study offering yields during two windows, 6 months prior to the election and 6 months after the election (including the month of election). The offering yield increases by 5.2 basis points in the six month period leading up to an election, followed by a yield decrease of 2.7 basis points. The sum of yield changes from these two windows are not statistically different from zero (F-statistics = 2.48, p-value > 0.10). Thus the spike in offering yields prior to the election compeletely reverts back after the election.

In untabulated tests, we experiment additional robustness checks. First, to ensure that our results are not driven by a small number of large states, we drop the three states with the largest amount of bond issues (i.e., California, New York, and Texas) and re-estimate the models. Our conclusions are not sensitive to the exclusion of these states. Second, we split the sample into quartile portfolios based on offering size, or time to maturity, and estimate the baseline model (i.e., specification in column (3) of Table 4). Election similarly affects yields among bonds of different offering sizes and maturities. We do not find statistical and economically significant differences across bonds of different offering yields and different offering sizes. Third, we apply a propensity score matching (PSM) estimator to construct the treatment and control sample of bonds. Specifically, for each bond issued during the election period, we search for a matching bond with closest propensity scores issued during the non-election period, where the propensity score is computed based on bond characteristics and macroeconomic conditions. We find similar results that bonds issued during the election period demand higher offering yields.

8 Conclusion

Through the lens of U.S. gubernatorial elections and municipal bond markets, we study the impact of political uncertainty on public financing costs. From both the primary and the secondary markets, we find robust empirical evidence that political uncertainty increases public financing costs, and its impact systematically varies with economic conditions, state finance, and state budgetary institutions. Our main empirical findings can be summarized as follows.

First, we find that the offering yields of municipal bonds temporarily increase by six to eight basis points during the election period. Bonds issued in states with an incumbent governor facing term limit are associated with offering yields that are three basis points higher.

Second, the impact of political uncertainty on public financing costs varies systematically with local economic conditions. Consistent with the theoretical prediction by Pastor and Veronesi (2011, 2012), the impact of political uncertainty on public financing costs is more pronounced during local economic contractions.

Third, several state fiscal and budgetary institutions, such as GAAP-based budgeting, tax-raising limit, and spending-increase limit, mitigate the adverse impact of political uncertainty on borrowing costs.

Finally, we explore the mechanisms through which political uncertainty affects public financing costs. Evidence from the prices and transactions of municipal bonds in the secondary market suggests that the investors are averse to political uncertainty and they demand compensation for bearing such an uncertainty during the election period. In summary, temporarily increase in risk premium due to political uncertainty is the driving force behind the escalated offering yields during the election period.

Several interesting questions remain unanswered. For example, if political uncertainty affects public financing costs, is it possible for municipal bond issuers to hedge such uncertainty? If during any year, some states face gubernatorial elections while other states do not, to reduce the adverse impact of political uncertainty, is it possible for different states to set up a co-insurance scheme? How can we solve the adverse selection and moral hazard problems if we implement such a co-insurance scheme? We leave them for future research.

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Figure 1: Municipal Bonds Aggregate Offering Yield and Yield Spread, 1990 to 2010

The figure plots the average offering yield (in percentage), and yield spread (in percentage) over the sample period of 1990 to 2010. The yield spread is the difference between the offering yield and maturity-matched benchmark Treasury bond yield.

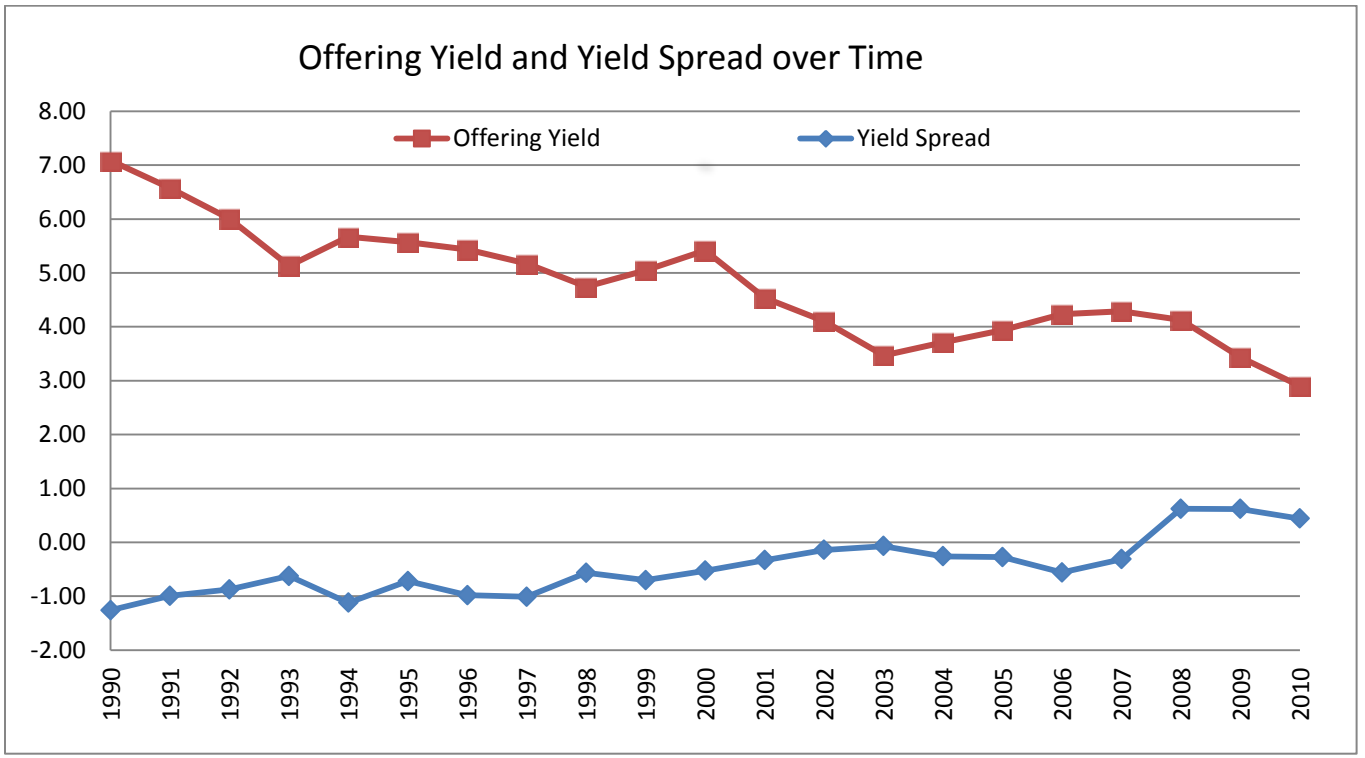

Figure 2: Bond Yield during the Election Period

Yield spread (Panel A) and seasonal adjusted yield spread (Panel B) are reported over the period of 6 months before and after the election. The time to election is reported on the X-axis, where the month of election is labeled as $t = ELCT$, 1 month before the election is labeled as $t = -1M$, 1 month after the election is labeled as $t = 1M$, etc. The Y-axis is (adjusted) yield spread in percentage. Panels C and D graph the monthly yield spread in election and non-election years respectively. The X-axis is the calendar month of the year. The yield spread is the difference between offering yield and the maturity-matched benchmark Treasury's yield. The seasonal adjusted yield spread is estimated by regressing yield spread over 12 monthly dummies.

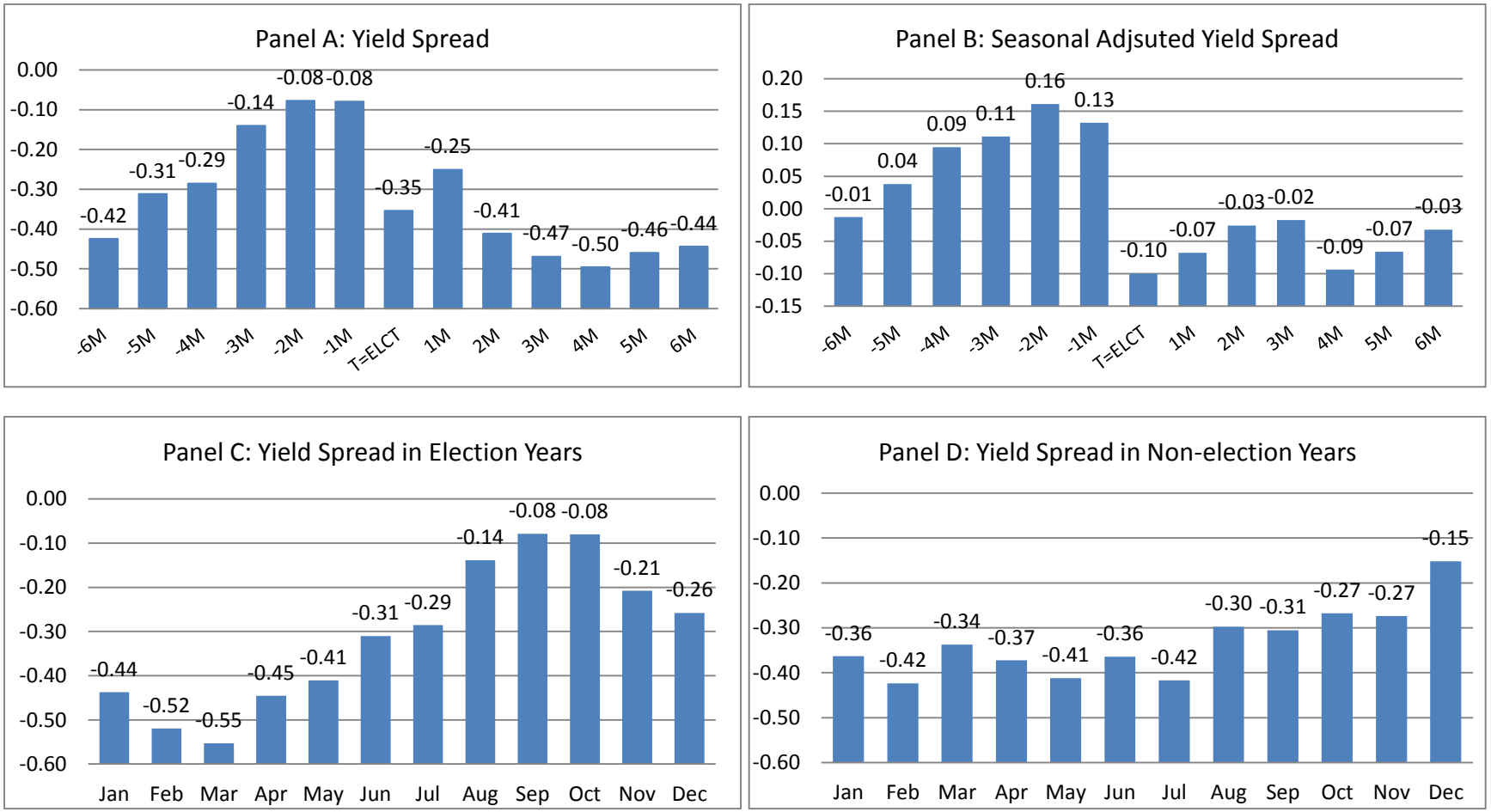

Figure 3: Impact of Elections on State-Level Municipal Bond Index Yield Spreads

The figure plots the state-level municipal bond index yield spreads (Panel A) and seasonal adjusted yield spreads (Panel B) of different maturities (1-, 5-, 10-, and 20-year) over the period of 6 months before and after the election. The time to election is reported on the X-axis, where the month of election is labeled as $t = ELCT$, 1 month before the election is labeled as $t = -1M$, 1 month after the election is labeled as $t = 1M$, etc. The Y-axis is (adjusted) yield spread in percentage. This figure also plots the monthly yield spreads in election (Panel C) and non-election years (Panel D). The X-axis is the calendar month of the year. The yield spread is the difference between municipal bond index market yield and maturity-matched benchmark Treasury's yield. The seasonal adjusted yield spread is estimated by regressing yield spread over 12 monthly dummies.

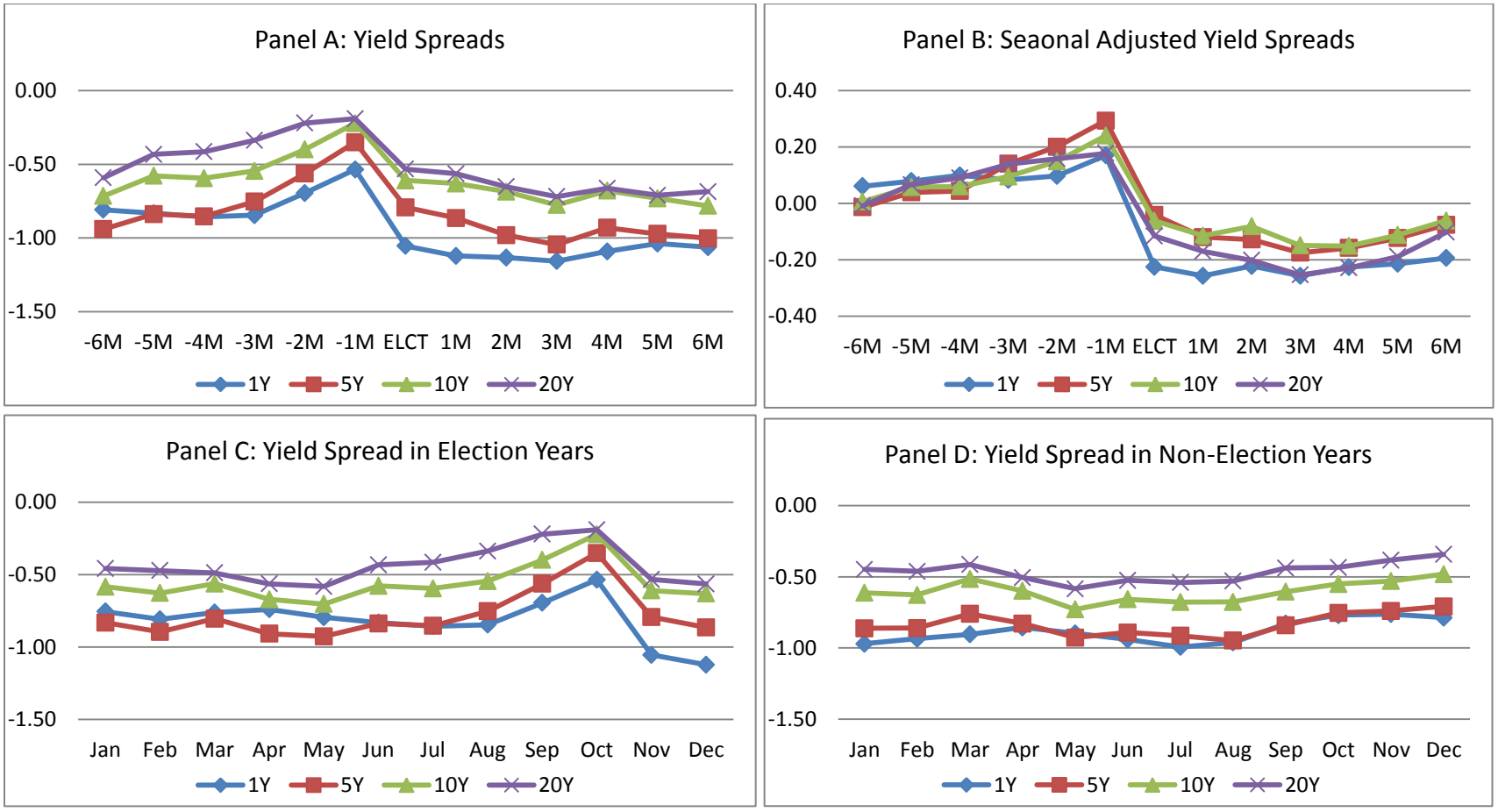

Table 1: Summary Statistics of the Municipal Bonds Sample

This table shows the summary statistics of the municipal bond sample. The sample period is from January 1990 to November 2010. All variables are defined in Appendix A.

Panel A: Descriptive Statistics by States

State	Freq.	Yield (%)	Ave. Maturity	Offering Amount per issue	Total Offering Amount	Real GDP	Debt/GDP Ratio (%)	Unemployment Rate (%)
Alabama	1,179	4.87	186	21.23	25,035	114,633	0.04	5.32
Alaska	345	4.53	166	42.89	14,797	27,519	0.17	6.98
Arizona	2,105	4.67	163	33.92	71,395	163,908	0.03	5.48
Arkansas	2,574	4.36	166	7.24	18,642	67,703	0.04	5.55
California	9,616	4.88	212	50.37	484,341	1,278,324	0.05	6.86
Colorado	2,557	4.85	186	23.95	61,232	159,802	0.04	4.86
Connecticut	1,683	3.99	135	36.15	60,845	155,569	0.12	5.32
Delaware	157	4.76	174	46.58	7,312	33,816	0.11	4.12
Florida	4,075	5.04	210	45.78	186,573	457,377	0.04	5.47
Georgia	1,669	4.47	165	46.09	76,925	261,932	0.03	5.46
Hawaii	224	4.70	168	98.91	22,155	42,283	0.12	4.40
Idaho	543	4.47	158	12.89	7,001	37,496	0.05	5.11
Illinois	2,309	4.54	138	20.94	48,355	430,618	0.07	5.73
Indiana	3,013	4.57	143	17.65	53,173	179,422	0.05	4.53
Iowa	1,350	4.17	120	8.66	11,690	91,025	0.03	3.90
Kansas	2,991	4.14	127	10.18	30,436	83,581	0.03	4.87
Kentucky	2,109	4.47	150	16.32	34,418	104,759	0.07	5.57
Louisiana	1,224	4.72	169	25.03	30,631	129,483	0.07	5.73
Maine	538	4.21	133	20.79	11,186	34,068	0.11	5.45
Maryland	1,239	4.59	180	48.87	60,545	173,997	0.07	4.87
Massachusetts	2,798	4.05	138	45.58	127,526	263,261	0.16	5.45
Michigan	5,277	4.42	149	18.68	98,571	293,622	0.06	6.66
Minnesota	6,915	4.07	128	9.28	64,171	185,979	0.03	4.58
Mississippi	1,076	4.51	137	11.64	12,526	61,038	0.05	6.33
Missouri	2,928	4.51	152	14.49	42,428	166,032	0.06	4.91
Montana	530	4.33	137	7.87	4,173	20,766	0.13	4.57
Nebraska	3,416	3.98	118	6.84	23,381	58,558	0.03	3.62
Nevada	767	4.57	158	45.27	34,724	71,602	0.04	5.81
New Hampshire	453	4.31	154	24.10	10,919	42,665	0.14	4.25
New Jersey	4,312	4.23	139	29.13	125,630	320,703	0.10	5.48
New Mexico	1,105	4.18	132	19.65	21,709	54,522	0.07	5.85
New York	8,659	4.25	141	51.63	447,106	753,979	0.11	6.07
North Carolina	1,260	4.53	156	40.19	50,641	237,605	0.03	5.00
North Dakota	775	4.26	118	5.82	4,512	18,802	0.07	3.35
Ohio	4,388	4.43	160	24.63	108,076	342,039	0.05	6.05

Oklahoma	2,278	3.46	87	10.10	23,019	96,950	0.06	4.89
Oregon	1,589	4.37	152	21.08	33,504	117,208	0.06	6.66
Pennsylvania	8,109	4.26	155	20.39	165,305	369,561	0.06	5.75
Rhode Island	478	4.33	151	27.10	12,952	32,737	0.18	6.25
South Carolina	1,392	4.08	136	32.94	45,852	107,114	0.08	6.53
South Dakota	383	4.25	140	11.68	4,474	25,190	0.09	3.49
Tennessee	1,908	4.40	155	25.95	49,504	163,441	0.02	5.89
Texas	11,816	4.51	168	25.34	299,466	709,791	0.02	5.86
Utah	1,016	4.35	150	24.48	24,872	64,543	0.06	4.46
Vermont	167	4.33	159	29.97	5,005	17,660	0.12	4.32
Virginia	1,517	4.66	177	44.98	68,233	238,976	0.05	3.95
Washington	2,925	4.60	153	30.42	88,971	193,006	0.06	5.89
West Virginia	1,248	4.47	139	14.42	7,770	38,862	0.09	6.56
Wisconsin	343	5.28	202	22.65	17,996	162,478	0.07	4.50
Wyoming	175	4.55	156	13.51	2,365	18,375	0.06	4.59
Average		4.42	156	27.51			0.06	5.55
Total	121,503				3,342,068	9,274,379		

Table 2: Summary Statistics of Selected Variables

Panel A reports summary statistics of selected variables used in subsequent regressions. Panel B reports correlation coefficients of selected variables. Bold numbers denote significance at the 1% level. Appendix A provides definitions of these variables.

Panel A: Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Election Period – Fiscal	121,503	0.08	0.26	0	1
Election Period – 6 months	121,503	0.15	0.36	0	1
Election Period – Calendar	121,503	0.25	0.43	0	1
Term Limited or Retired	121,503	0.39	0.49	0	1
Offering Yield	121,503	4.42	1.22	0.76	8.02
Log (Offering Amount)	121,382	2.03	1.56	-12.43	8.96
Time to Maturity	121,503	155.69	81.27	1	1202
Benchmark Treasury Yield	121,503	4.75	1.41	0.28	8.92
Total Income Tax Rate	115,632	41.10	3.32	28	48.15
Term Spread	121,503	1.73	-1.27	0.7	3.69
G.O. Bond	121,503	0.47	0.50	0	1
Competitive Offering	121,503	0.18	0.38	0	1
Insured Bond	121,503	0.46	0.50	0	1
Additional Credit	121,503	0.12	0.33	0	1
Pre-refunded Bond	121,503	0.16	0.37	0	1
Callable	121,503	0.56	0.33	0	1
Rollover Bond	121,503	0.39	0.49	0	1
Non-Investment Grade	121,503	0.52	0.50	0	1
Gross Spread	27,193	9.72	5.58	0.01	30
Population Growth Rate	118,989	1.01	0.01	0.94	1.10
Log (Real GDP)	121,503	12.42	0.98	9.45	14.26
Unemployment Rate	121,503	5.55	1.70	2.1	14.5
Economic Leading Index	121,503	1.00	1.44	-9.5	7.82
Government GDP /Total GDP	121,503	0.11	0.02	0.07	0.26
Debt/GDP Ratio	118,989	0.06	0.03	0.01	0.25
Implied State Rating	121,503	20.64	2.02	2	22
Political Control	121,503	0.38	0.48	0	1
GAAP	121,503	0.49	0.50	0	1
Revenue Limit	121,503	0.16	0.36	0	1
Spending Limit	121,503	0.44	0.50	0	1
Tax-Raise Limit	121,503	0.31	0.46	0	1

Panel B: Correlation Coefficients of Selected Variables

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Election Period – Fiscal	(1)	1.00												
Offering Yield	(2)	**0.03**	1.00											
Log (Offering Amount)	(3)	0.00	**0.11**	1.00										
Time to Maturity	(4)	**0.01**	**0.61**	**0.31**	1.00									
Benchmark Treasury Yield	(5)	**0.04**	**0.82**	**0.10**	**0.40**	1.00								
Total Income Tax Rate	(6)	**0.07**	**0.13**	**-0.06**	**0.01**	**0.22**	1.00							
Term Spread	(7)	**-0.08**	**-0.21**	-0.01	**-0.11**	**-0.32**	**-0.14**	1.00						
G.O. Bond	(8)	0.00	**-0.25**	**-0.16**	**-0.30**	**-0.12**	**0.01**	**0.02**	1.00					
Competitive Offering	(9)	**-0.03**	**-0.31**	**-0.09**	**-0.17**	**-0.31**	**-0.18**	**0.02**	**0.14**	1.00				
Insured Bond	(10)	**0.02**	**-0.09**	**0.18**	**-0.02**	**0.05**	**-0.02**	**-0.10**	**0.08**	**-0.04**	1.00			
Additional Credit	(11)	-0.01	**-0.12**	0.00	**-0.02**	**-0.09**	**-0.12**	**-0.04**	**0.20**	**0.09**	**-0.04**	1.00		
Callable	(12)	0.00	**0.48**	**0.15**	**0.67**	**0.32**	**0.02**	**-0.13**	**-0.19**	**-0.10**	**0.02**	**0.03**	1.00	
Non-investment Grade	(13)	**-0.02**	**0.11**	**-0.26**	**0.07**	**-0.05**	**-0.01**	**0.04**	**-0.10**	**0.04**	**-0.30**	**-0.01**	**0.07**	1.00

Table 3: Comparison of Bond Characteristic in Election or Non-Election Periods

This table compares characteristics of municipal bonds issued during the election period (column (1)), and during the non-election period (column (2)), and reports the t-test for the mean difference (column (3)). Election period is the period after the state's current fiscal year end, and before the date of a state's coming election. Non-election period includes dates other than the election period. Columns (1) and (2) report standard deviations in parenthesis, and column (3) reports the *t*-statistics of the difference between (1) and (2) in parenthesis. ***, **, and * denote the statistical significance at the 1%, 5% and 10% levels, respectively.

	Non-election	Election	t-test
	(1)	(2)	(1) - (2)
Offering Yield	4.408	4.531	-0.123***
	(1.226)	(1.143)	(-9.845)
Average Offering Amount	27.340	29.546	-2.205**
	(90.217)	(101.013)	(-2.021)
Time to Maturity	155.450	158.697	-3.247***
	(81.251)	(81.454)	(-3.662)
Gross Spreads	9.701	9.927	-0.226*
	(5.568)	(5.734)	(-1.681)
G.O. Bond	0.467	0.473	-0.006
	(0.499)	(0.499)	(-1.112)
Competitive offering	0.180	0.130	0.050***
	(0.384)	(0.337)	(13.421)
Insured Bond	0.456	0.497	-0.041***
	(0.498)	(0.500)	(-7.497)
Additional Credit Enhancement	0.125	0.117	0.008**
	(0.331)	(0.321)	(2.364)
Callable Bond	0.555	0.558	-0.003
	(0.334)	(0.332)	(-0.760)
Non-Investment Grade	0.524	0.487	0.037***
	(0.499)	(0.500)	(6.774)

Table 4: Elections and Municipal Bond Offering Yields

Table 4 reports the impact of election on municipal bond yield. In all specifications, the dependent variable is the municipal bond's offering yield. Election period is defined as the period after the state's current fiscal year end, and before the date of a state's coming election. Other independent variables are defined in Appendix A. All specifications include constant terms, capital purpose, state, year and month fixed effects. Columns (1) to (3) include the entire sample of municipal bonds. Columns (4) to (6) include subsample of general obligation bonds, insured bonds, and rollover bonds, respectively. The estimation method is the weighted least square (WLS), where the weight is the frequency of bond issuance per state. T-statistics, reported in parentheses, are calculated based on standard errors clustered by states. ***, **, and * denote the statistical significance at the 1%, 5% and 10% levels, respectively.

	Baseline	Bond Controls	State Controls	G.O Bonds	Insured Bonds	Rollover Bonds
	(1)	(2)	(3)	(4)	(5)	(6)
Election	0.081***	0.068***	0.070***	0.069***	0.066***	0.083***
	(3.46)	(4.56)	(5.18)	(3.73)	(6.36)	(6.20)
Term Limit	0.033**	0.041**	0.038***	0.028**	0.025*	0.028***
	(2.31)	(2.61)	(3.01)	(2.08)	(1.78)	(3.16)
Benchmark T-bond yield	0.951***	0.579***	0.594***	0.589***	0.600***	0.618***
	(89.1)	(42.9)	(42.9)	(21.6)	(27.0)	(48.9)
Total Income Tax Rate	0.025	0.004	-0.028*	-0.042*	-0.018	-0.049**
	(0.77)	(0.17)	(-1.80)	(-1.75)	(-0.88)	(-2.09)
Term Spread	-0.002	0.045***	0.046***	0.047***	0.042***	0.037**
	(-0.22)	(4.07)	(4.26)	(3.22)	(3.70)	(2.41)
Log(Offering Amount)		-0.043***	-0.044***	-0.027***	0.002	-0.026***
		(-4.45)	(-4.43)	(-6.62)	(0.28)	(-2.92)
Time to Maturity		0.004***	0.004***	0.005***	0.004***	0.004***
		(26.6)	(25.7)	(11.2)	(25.4)	(17.8)
G.O. Bond		-0.124***	-0.124***	dropped	0.005	-0.099***
		(-6.21)	(-6.10)		(0.33)	(-6.22)
Competition Offering		-0.117***	-0.110**	-0.017	-0.053**	-0.091**
		(-2.80)	(-2.66)	(-0.33)	(-2.09)	(-2.22)
Insured Bond		-0.239***	-0.240***	-0.090***	dropped	-0.195***
		(-7.81)	(-8.00)	(-3.65)		(-7.05)
Additional Credit		-0.171***	-0.166***	-0.128***	-0.052***	-0.136***
		(-3.16)	(-3.04)	(-3.01)	(-3.77)	(-3.57)
Callable Bond		0.276***	0.279***	-0.01	-0.002	0.284***
		(7.31)	(7.65)	(-0.096)	(-0.023)	(6.22)
Non-Investment Grade		0.163***	0.165***	0.085***	0.034***	0.131***
		(13.9)	(13.1)	(9.86)	(7.74)	(12.1)
Population Growth Rate			1.569	0.867	0.877	-0.811
			(1.33)	(0.86)	(1.04)	(-0.96)

Log(Real GDP)			0.278	0.241	0.349	0.094
			(1.30)	(0.94)	(1.41)	(0.78)
State Unemployment Rate			0.023	0.012	0.019	0.001
			(1.03)	(0.48)	(0.96)	(0.036)
State Economic Leading Index			-0.076***	-0.088***	-0.054***	-0.077***
			(-4.76)	(-4.01)	(-3.95)	(-5.09)
State Government GDP/ Total GDP			3.829*	5.674*	3.304	2.198
			(2.01)	(1.86)	(1.35)	(1.42)
Debt/GDP Ratio			-1.265	-1.229	-0.895	-0.459
			(-0.94)	(-0.99)	(-0.91)	(-0.46)
Implied State Rating			-0.007***	-0.012***	-0.003	-0.002
			(-2.76)	(-2.97)	(-1.19)	(-0.62)
Constant	Included	Included	Included	Included	Included	Included
Capital Purpose Fixed Effects	YES	YES	YES	YES	YES	NO
Month Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
State Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	115,632	115,511	115,511	54,068	54,690	44,175
R-squared	0.69	0.80	0.81	0.88	0.90	0.86

Table 5: Elections, Macroeconomic Conditions, and Municipal Bond Offering Yields

This table evaluates the interactive effect of macroeconomic condition and elections on the offering yields of municipal bonds. Columns (1) to (3) use the NBER business cycle to determine the economic expansion and recession periods (i.e., contraction = 1; expansion = 0). In columns (4) to (6), an expansion (contraction) period is defined as the period when the state-level unemployment rate below (above) its historical median. In columns (7) to (9), an expansion (contraction) period is defined as the period when the state-level economic leading index is above (below) its historical median. The baseline specification is the specification (3) in Table 4. All specifications include constant terms, bond characteristics controls, macroeconomic condition controls, capital purpose, state, year and month fixed effects. We multiply the macroeconomic condition indicator with all independent variables, and hence the dummy variable of the macroeconomic condition indicator is dropped due to multicollinearity. The estimation method is the weighted least square (WLS), where the weight is the frequency of bond issuance per state. T-statistics, reported in parentheses, are calculated based on standard errors clustered by states. ***, **, and * denote the statistical significance at the 1%, 5% and 10% levels, respectively.

	NBER Business Cycle			State Unemployment Rate			State Leading Index		
	Expansion	Contraction	Interacted	Expansion	Contraction	Interacted	Expansion	Contraction	Interacted
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Election	0.063***	0.246***	0.063***	0.025**	0.097***	0.024**	0.019	0.128***	0.019
	(4.61)	(3.86)	(4.61)	(2.28)	(4.61)	(2.22)	(0.74)	(4.21)	(0.77)
Election x Economic Condition			0.183***			0.073***			0.109**
			(3.05)			(3.66)			(2.36)
Constant	Included	Included	Included	Included	Included	Included	Included	Included	Included
Bond Attributes Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Macroeconomics Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
Capital Purpose Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Month Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
State Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	99,754	15,757	115,511	63,301	52,210	115,511	56,909	58,602	115,511
R-squared	0.83	0.76	0.82	0.77	0.83	0.81	0.82	0.8	0.81

Table 6: Election and Offering Yields: Variation in Outcome Predictability, State Finance, and State Institutions

This table evaluates the cross-sectional variations of election's impact on municipal bond's offering yields. In column (1), the indicator variable takes the value of one when the percentage of swing vote in the election poll is above the historical median in the state, and zero otherwise. In columns (2) and (3), the indicator variable takes the value of one if the incumbent faces term-limit, and zero otherwise. In column (3), the indicator variable takes the value of one when a state has debt/ GDP ratio above its historical median during the election period, and zero otherwise. In columns (4) to (7), the indicator variable takes value of one if the state has GAPP-based budgeting, revenue-limit, spending-limit, and tax-raise-limit in place, respectively; and zero otherwise. All specifications include constant terms, bond characteristics controls, macroeconomic condition controls, capital purpose, state, year and month fixed effects. The estimation method is the weighted least square (WLS), where the weight is the frequency of bond issuance per state. T-statistics, reported in parentheses, are calculated based on standard errors clustered by states. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels, respectively.

	Election Indicators			State Finance Indicator	Institution Indicators			
	Swing Vote	Term limit	Term limited	Debt/GDP Ratio	GAAP	Revenue Limit	Spending Limit	Tax Raise Limit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Election	0.046**	0.054***	0.064***	0.032*	0.094***	0.073***	0.091***	0.080***
	(2.17)	(3.25)	(3.25)	(1.94)	(6.30)	(5.06)	(7.26)	(4.39)
Indicators	0.024		0.037**	-0.009	-0.115**	0.129**	-0.048	0.199
	(1.30)		(2.61)	(-0.57)	(-2.23)	(2.04)	(-1.08)	(1.02)
Election x Indicators	0.105***	0.048**	0.016	0.076***	-0.036**	-0.018	-0.043**	-0.027*
	(3.22)	(2.07)	(0.54)	(2.88)	(-2.04)	(-0.72)	(-2.68)	(-1.88)
Constant	Included	Included	Included	Included	Included	Included	Included	Included
Bond Characteristic Controls	YES	YES	YES	YES	YES	YES	YES	YES
Macroeconomics Controls	YES	YES	YES	YES	YES	YES	YES	YES
Capital Purpose Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Month Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
State Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Observations	115,511	115,511	59,780	115,511	115,511	115,511	115,511	115,511
R-squared	0.81	0.81	0.80	0.81	0.81	0.81	0.81	0.81

Table 7: Elections and State-Level Municipal Bond Index Yields

This table shows the impact of elections on state-level municipal bond index yields. Column (1) reports regression of the pooled sample of state-level municipal bond indices of different maturities. Columns (2) to (5) report regressions of state-level municipal bond indices by different maturities. The sample period is from January 1996 to December 2010. T-statistics, reported in parentheses, are calculated based on the standard errors clustered by states. ***, **, and * denote the statistical significance at the 1%, 5% and 10% levels, respectively.

	Pooled Across All Maturities	1 Year Bond	5 Year Bond	10 Year Bond	20 Year Bond
	(1)	(2)	(3)	(4)	(5)
Election	0.065***	0.040**	0.108***	0.056**	0.056***
	(2.95)	(2.27)	(3.26)	(2.50)	(3.25)
Term Limit	0.007	0.000	0.003	0.008	0.017*
	(0.69)	(0.03)	(0.20)	(0.72)	(1.78)
Constant	Included	Included	Included	Included	Included
Macroeconomics Controls	YES	YES	YES	YES	YES
Maturity Fixed Effects	YES	YES	YES	YES	YES
Month Fixed Effects	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
State Fixed Effects	YES	NO	NO	NO	NO
Observations	11,776	2,944	2,944	2,944	2,944
R-squared	0.86	0.95	0.90	0.90	0.90

Table 8: Election and the Secondary Market Trading of Municipal Bonds

This table shows the impact of elections on the secondary market trading activities of municipal bonds. The dependent variables in columns (1), (3), and (5) are the number of monthly customer trades (*Total Trades*, in hundreds) within a state. The dependent variables in columns (2), (4), and (6) are the number of monthly customer buy trades minus the total number of customer sell trades (*Net Buys*, in hundreds) within a state. In columns (1) and (2), the sample of trades includes both newly issued bonds and seasoned bonds. In columns (3) and (4), the sample of trades includes only seasoned bonds that have been issued at least 30 days. In columns (5) and (6), the sample of trades includes only newly issued bonds that have been issued in the past 30 days. The set of control variables includes macroeconomic conditions, state institutions, and state, year and month fixed effects. The sample period is from 1999 to 2010. T-statistics, reported in parentheses, are based on standard errors clustered by states. ***, **, and * denote the statistical significance at the 1%, 5% and 10% levels, respectively.

	All Bonds		Seasoned Bonds		Newly Issued Bonds	
	Total Trades	Net Buys	Total Trades	Net Buys	Total Trades	Net Buys
	(1)	(2)	(3)	(4)	(5)	(6)
Election	-4.579***	-4.335**	-4.497***	-4.755**	-0.037	-0.014
	(-2.68)	(-2.40)	(-2.80)	(-2.53)	(-1.00)	(-0.39)
Term Limit	-1.780	-2.560*	-1.357	-1.874	-0.080	-0.086
	(-1.24)	(-1.80)	(-1.07)	(-1.62)	(-1.45)	(-1.49)
Constant	Included	Included	Included	Included	Included	Included
Macroeconomic Controls	YES	YES	YES	YES	YES	YES
Month Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
State Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	3,831	3,831	3,801	3,801	3,726	3,726
R-squared	0.98	0.89	0.98	0.84	0.87	0.86

Table 9: Robustness Checks - Alternative Definitions of the Election Period

This table reports the impact of elections on municipal bond's offering yield when using alternative definitions of the election period. In column (1), election period is the period after a state's current fiscal year end to the date of a state's coming election. In column (2), election period is the period 6-month prior to the election to the date of election. In column (3), election period is the period from the beginning of the year to the date of a state's coming election. In column (4), election period is defined the same as in column (2). In addition, post-election period is the period between the date of election and 6-month after the election. All specifications include constant terms, bond characteristics controls, macroeconomic condition controls, capital purpose, state, year and month fixed effects. The sample includes all tax-exempt municipal bonds but Build American Bonds (BAB), anticipation notes, certificates, and other types of non-standard bonds. The estimation method is the weighted least square (WLS), where the weight is the frequency of bond issuance per state. T-statistics, reported in the parentheses, are calculated based on standard errors clustered by states. ***, **, and * denote the statistical significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)	(4)
Election Period – Fiscal	0.070***			
	(5.18)			
Election Period – 6 month		0.056***		0.053***
		(4.29)		(4.32)
Election Period – Calendar			0.029*	
			(1.862)	
Post-Election Period – 6 month				-0.027**
				(-2.60)
Constant	Included	Included	Included	Included
Bond Attributes Control	YES	YES	YES	YES
Macroeconomics Control	YES	YES	YES	YES
Capital Purpose Fixed Effect	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
Month Fixed Effect	YES	YES	YES	YES
State Fixed Effect	YES	YES	YES	YES
Observations	115,551	115,551	115,551	115,551
R-squared	0.81	0.81	0.81	0.81

Appendix A: Variable Definitions and Data Source

This table provides the definitions, construction method of the variables, as well as the data source. MBSD indicates the Municipal Bond Securities Database. MSRB is the Municipal Securities Rulemaking Board. SDC is the Security Data Corporation. NASBO indicates the National Association of State Budget Officers. PTN is polling the Nations. NCSL represents the National Conference of State Legislatures. BLS indicates the Bureau of Labor Statistics. BEA indicates the Bureau of Economic Analysis. SGF indicates the State Government Finance data from the U.S. Census. FRED represents Federal Reserve Economic Data. MSRB is the Municipal Security Rulemaking Boards. All variables with dollar values are adjusted to 1997 dollars using consumer price index (CPI).

Variable	Definition	Data Source
	A: Municipal Bond Variables	
Offering Yield	Yield to maturity at the time of issuance. Tranche dollar value weighted average of offering, if offering yield is available.	MBSD
Time to Maturity	Time to maturity in month. Tranche dollar value weighted average, if the time to maturity is available.	MBSD
Capital Purpose	Code indicating what the funds will be used for (e.g., new money, pre-refunding another issue, current refunding remarketing, etc.). Identified by the maximum tranches bond.	MBSD
G.O. Bonds	A flag indicating that the bond is unlimited general obligation funds when 1; it is 0 otherwise.	MBSD
Callable	Tranche dollar value weighted average call ability, 1 denotes a callable bond, 0 denotes a non-callable bond.	MBSD
Additional Credit Enhancement	Flag denoting whether the bond has additional credit associated with it. Tranche dollar value weighted average.	MBSD
Bond Insurance	Bond issuance code of the issue, identified by the maximum tranche bond.	MBSD
Offering Date	The sales date the issue was originally offered.	MBSD
Offering Amount	The total par value (or discount value) of debt initially issued as per the offering statement.	MBSD
Competitive Offering	Flag indicating if bond is offered by a competitive method, with 1 denoting yes, and 0 indicating otherwise.	MBSD

Rating - Weighted	Tranche equal weighted bond ratings at the time of issuance, augmented by the SDC's bond rating. Combine the long-term rating by Moody, S&P, and Fitch in order.	MBSD; SDC
Rating - Longest Maturity	Bond rating of the longest maturity in the issue at the time of issuance, augmented with the SDC's rating. Combine the long-term rating by Moody, S&P, and Fitch in order.	MBSD; SDC
Non-Investment	Flag indicating that bond is not rated or rate below BBB-.	MBSD & SDC
State-level Municipal Bond Index Yield	The yield of state municipal bond index from 1996 to 2010.	Bloomberg
Gross Spread	The difference between the price that the issuer receives for its securities and the price that investors pay for them.	SDC
Total Number of Trades	The total number of trades of municipal bonds in secondary markets for each state per month.	MSRB
Number of Net Buy Trades	The number of buy trades - the number of sell trades of municipal bonds in secondary markets for each state per month.	MSRB
	B. Election Variables	
Election Period – Fiscal	Indicator equals 1 if the bond was issued before the upcoming election date and after the current fiscal ending date; it is 0 otherwise.	Constructed
Election Period – Calendar	Indicator equals 1 if the bond was issued before the upcoming election date but in the same calendar year; it is 0 otherwise.	Constructed
Election Period – 6 Months	Indicator equals 1 if the bond was issued in the 6 months prior to the election date; it is 0 otherwise.	Constructed
Post-Election Period – 6 Months	Indicator equals 1 if the bond was issued in the 6 months after the election date; it is 0 otherwise.	Constructed
Term Limits	Incumbent governor cannot stand for re-election due to either term limits or retirement.	Wikipedia
Swing Vote	An indicator equals to one if the percentage of swing vote in the poll prior to election is above its historical median and zero otherwise	PTN
	C. State Institution Variables	
GAAP	Flag indicating if the state adopted generally accepted accounting principles.	NASBO
Revenue Limit	Flag indicating if there is a restriction on state revenue.	NCSL, NASBO
Spending Limit	Flag indicating if there is a restriction on state expenditures.	NCSL, NASBO

Tax Raise Limit	Flag indicating if there needs to be a majority vote in the legislature in order to raise taxes.	NCSL, NASBO
Political Control	Flag indicating if the party in control of the upper and lower houses is the affiliated party of the governor.	NCSL, U.S. Census
	D. Macroeconomic Variables	
Benchmark T-bond Yield	Yield of the Treasury maturity-matched bond.	CRSP & MBSD
Term Spread	The difference of yield to maturity between 10 year T-bond and 90 days T-bill, matched with the month of offering.	FRED
State Economic Leading Index	Monthly state-level leading economic activity index.	FRED
Unemployment Rate	Monthly unemployment rate of the state.	BLS
Real GDP	State real GDP volume in 1997 dollars for all industry.	BEA
Government GDP/ Total GDP	Proportion of government-related GDP to all industrial GDP volume in the state.	BEA
Population Growth Rate	Annual growth rate of the state's population. State population is in thousands. Collected from State Government Finance up to 2006 and the U.S Census estimate from 2007 on.	SGF
Capital Outlay	State expenditure on capital outlay (infrastructure) in 1997 dollars.	SGF
Debt Outstanding /GDP	The ratio of state debt outstanding over the real GDP volume in 1997 dollars.	SGF& BEA
Total Income Tax Rate	Sum of the federal income tax rate and the state income tax rate.	NBER
State Ratings	Annual updated state credit rating. Combined Moody, S&P, and Fitch in order. (1995-2009)	U.S. Census
Implied State Ratings	The highest bond rating associated with the state in a given quarter, packaged using the municipal bonds sample.	MBSD, SDC

Appendix B: Political Cycles on State Policies

This table reports the regression of several state policy instruments over election year and state control variables. Sample period is from January 1990 to December 2009. The state control variables include lagged state real GDP per capita, lagged state personal income per capita, lagged state unemployment rate, percentage of state population with high school degree, and percentage of state population with college degree. In all regressions, we control for state and year fixed effects. T-statistics, reported in the parentheses, are calculated based on standard errors clustered by states. ***, **, and * denote the statistical significance at the 1%, 5% and 10% levels, respectively.

	Total Tax	Capital Outlays	Debt Outstanding	Total Tax	Capital Outlays	Debt Outstanding
	(1)	(2)	(3)	(4)	(5)	(6)
Election Year	-0.007	0.001	0.026	-0.007	0.001	0.025
	(-0.45)	(0.27)	(1.57)	(-0.44)	(0.22)	(1.55)
Term Limit	-0.024	0.003	0.039			
	(-0.96)	(0.54)	(0.83)			
Democrat Incumbent				-0.049	-0.007	0.098
				(-0.98)	(-0.56)	(1.05)
Democrat Incumbent x Term Limit				-0.02	0.019**	-0.024
				(-0.52)	(2.18)	(-0.33)
Republican Incumbent x Term Limit				-0.021	-0.014	0.097
				(-1.02)	(-1.52)	(1.32)
Constant	Included	Included	Included	Included	Included	Included
State Control Variables	YES	YES	YES	YES	YES	YES
Yearly Fixed Effect	YES	YES	YES	YES	YES	YES
State Fixed Effect	YES	YES	YES	YES	YES	YES
Observations	992	992	992	999	999	999
R-squared	0.76	0.81	0.93	0.76	0.82	0.93

Appendix C: Impact of Elections on Bond Issuance Amount

This table examines the impact of elections on bond issuance amount. In columns (1) – (3), we regress the logarithm of offering amount of bonds on various definitions of election period. The estimation method is the weighted least square (WLS), where the weight is the frequency of bond issuance per state. In columns (4)- (6), we first aggregate monthly total offering amount within a state, and then regress the logarithm of monthly offering amount on the election period indicators using the ordinary least square (OLS) regressions. T-statistics, reported in the parentheses, are calculated based on standard errors clustered by states. ***, **, and * denote the statistical significance at the 1%, 5% and 10% levels, respectively.

	Offering Amount Per Bond				Monthly Offering Amount Per State		
	(1)	(2)	(3)		(4)	(5)	(6)
Election Period - Fiscal	-0.024				-0.131***		
	(-0.94)				(-3.21)		
Election Period - 6 months		0.011				-0.063*	
		-0.68				(-1.72)	
Election Period - Calendar			-0.002				0.031
			(-0.12)				(1.20)
Constant	Include	Include	Include	Include	Include	Include	Include
State Macroeconomic Controls	YES	YES	YES		YES	YES	YES
Capital Purpose Fixed Effects	YES	YES	YES		NO	NO	NO
Month Fixed Effects	YES	YES	YES		YES	YES	YES
Year Fixed Effects	YES	YES	YES		YES	YES	YES
State Fixed Effects	YES	YES	YES		YES	YES	YES
Observations	118,868	118,868	118,868		10,604	10,604	10,604
R-squared	0.18	0.18	0.18		0.60	0.60	0.60