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

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Abstract

This paper investigates the impact of political uncertainty caused by U.S. gubernatorial elections on the borrowing costs of municipal bond issuers in the past twenty years. We find that the offering yields of municipal bonds issued during election periods are seven to eight basis points higher than those of bonds issued during non-election periods. Bonds issued in states with an incumbent governor facing term limits or retirement are associated with offering yields that are higher by an additional three basis points. To provide a scale for these results, the average yield difference between investment-grade and non-investment-grade municipal bonds is six basis points, and the average yield difference between rated bonds and non-rated bonds is 28 basis points. The impact of elections on the borrowing costs of municipal bond issuers is more pronounced during local economic downturns and among states with more outstanding debt. Several state fiscal and budgetary institutions, such as GAAP-based budgeting, spending limits, and tax-raise limits, mitigate the adverse impact of political uncertainty on the borrowing cost. Evidence from transactions of municipal bonds in the secondary market suggests that declining demand due to investors' uncertainty aversion is the driving force behind the escalated offering yield during election periods.

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

JEL Codes: G12, G18, G28

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"Standard & Poor's Ratings Services said today that it lowered its long-term sovereign credit rating on the United States of America to 'AA+' from 'AAA'.... The political brinksmanship of recent months highlights what we see as America's governance and policymaking becoming less stable, less effective, and less predictable than what we previously believed."

— Standard and Poor's press release on the U.S. downgrade, August 5, 2011

1 Introduction

Recently, a great deal of attention has been paid to public debt. As of the end of fiscal year 2010, 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] Clearly, public debt financing costs are enormously 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 and claimant status of an issue. Recent literature suggests that liquidity and liquidity risk directly impact yield. For a subset of tax-exempted bonds, tax and tax risk affect yield.[2]

Motivated by a burgeoning body of research relating political uncertainty to equity risk and return, as well as the dynamics of corporate investment (Boutchkova, Doshi, Durnev, and Molchanov 2011; Durnev 2010; Julio and Yook 2011 and 2012; Pastor and Veronesi 2011a and 2011b), we suggest that political uncertainty - the uncertainty about outcomes of political elections, elected officials' preference for economic policies, and their likely course of policy actions - also plays an important role in determining public financing costs.

Through the lens of U.S. gubernatorial elections, we investigate whether political uncertainty affects public debt financing costs. The United States Constitution grants state governments significant power in enacting and changing statutes and policies that directly affect a state's economy.

[1] State and local government debts outstanding data are obtained from the U.S. Census Bureau (http://www.census.gov) and the federal debt outstanding is obtained from the Bureau of the Public Debt under the United States Department of the Treasury (http://www.publicdebt.treas.gov).

[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. In the context of municipal bonds, Novy-Marx and Rauh (2011) study fiscal imbalance due to the state pension fund's investment loss and potential default impact on the yield during recent financial crisis. A number of papers highlight the demand-side-induced liquidity premium on the yield of U.K. government securities and U.S. Treasury securities, including Greenwood and Vayanos (2010) and Krishnamurthy and Vissing-Jørgensen (2012). Wang, Wu, and Zhang (2008) find the liquidity premium accounts for 9-13% of yields for AAA-rated municipal bonds, 9-15% for AA/A bonds, and 8-19% for BBB bonds. Key papers studying tax and tax risk of municipal bond yields include Trczinka (1982), Green (1993), Chalmers (1998), Ang, Bhansali, and Xing (2010), and Longstaff (2011), among others.

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 state's 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." (Peltzman, 1987). Therefore, there is little doubt that gubernatorial elections matter for state-level economies. Through the ultimate 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. Also, the timing of gubernatorial elections is predetermined and not affected by general economic conditions.[3] Therefore, the empirical framework helps at least partially overcome potential endogeneity associated with political uncertainty and the state of the economy. Additionally, in the U.S., most states hold gubernatorial elections on a rotating basis every four years, which 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. Gubernatorial elections provide a rich empirical framework in which to study political uncertainty and public financing costs by comparing changes in these costs during election and non-election periods within a state, while benchmarking against other states without elections.[4]

In this paper, we focus on municipal bonds, the primary source of state and local public debt.[5] We find that municipal bonds issued during election periods are associated with 7 to 8 basis points

[3] Over 314 elections during the period from 1988 to 2010, there are only two special elections: California in 2003 and Utah in 2008. All of our results are similar if we exclude these elections. 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. Exceptions are Vermont and New Hampshire, where elections take place every two years. Our results are robust to the exclusion of these two states.

[4] While it is certainly interesting to study city, county, and district elections, several issues related to identification strategy make such experiments less appealing. Adrian (1955) insightfully points out that "a small turnover does not result in the same percentage distribution of the vote among various segments of the population as would be found in a large turnout." The timing of the election directly affects voter turnouts. A well-developed literature has recognized that politicians and special interest groups have strong incentives to strategically manipulate the timing of elections in order to achieve the best interests for their own constituents. Given the endogenous nature of the timing of local elections, we focus on state-level gubernatorial elections, which are less subject to such direct manipulation in timing.

[5] 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))

higher offering yields than bonds issued during non-election periods. The effect is statistically significant at the 1% level. Moreover, the effects are economically sizeable. To put the 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 non-investment-grade bonds is 6 basis points, and the average yield difference between rated bonds and non-rated bonds is 28 basis points. The yield difference between general obligation bonds and non-general-obligation bonds is about 12 basis points. Moreover, political uncertainty's impact on government financing costs escalates during elections with intensified political competitions. Across different elections, municipal bonds issued in a state with an incumbent governor facing term limits or retirement demand an additional 3 basis points premium compared to otherwise similar bonds issued by the same state with an incumbent governor not facing term limits or retirement.

Second, we ask 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 upturns in the local economy from elections coincident with downturns in the local economy. Consistent with the theoretical model's prediction in Pastor and Veronesi (2011a), we show 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 for bonds issued during election periods coincident with economic expansions.

Third, 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 United States, there are significant variations in financial status and fiscal and budgetary institutions across different states.[6] 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. The source of our identification comes entirely from the within-state time-series variations (as we *always* include the state fixed effects). Considerable evidence suggests that a high debt to state gross domestic product (Debt/GDP) ratio, the adoption of generally accepted accounting principles (GAAP) in the government budgeting process, and the implementation of spending limits and tax-raise limits significantly ameliorate po-

[6] North (1990) characterizes institution as "the humanly devised constraints that structure human interaction."

litical uncertainty's impact 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 limits reduces financing costs by 4.3 basis points, and the implementation of tax-raise limits reduces financing costs by 3.3 basis points during election periods.

Finally, we explore the mechanisms through which political uncertainty affects municipal bond yield. We consider both the supply side (i.e., from the perspective of bond issuers) and the demand side (i.e., from the perspective of investors). On the supply side, we consider two hypotheses. First, an issuer may postpone the issuance of bonds until after the election 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 on the secondary market, which are less likely to be 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. Second, according to the opportunistic political cycle hypothesis (Nordhaus, 1975), to maximize their probability to win re-elections, incumbents have incentives to adopt expansionary policies financed by debt before elections. We study a large set of state policy instruments, and find little evidence that they vary over election cycles. In addition, the quantity of bond offering does not increase prior to elections. Overall, our empirical evidence lends little support to the opportunistic political cycle hypothesis, at least in the context of U.S. gubernatorial elections.

On the demand side, one potential explanation for our findings is that uncertainty-averse investors are less willing to purchase municipal bonds from a state prior to an election, which leads to a reduction in demand that requires higher offering yields to clear the primary market. 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) during elections. Overall, our evidence suggests that the declining demand due to uncertainty aversion is the driving force behind the escalated offering yield during election periods.

Despite its sound 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.[7] 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, which is often *ex post* labeled as political uncertainty, 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 margins, party changes, and polls, 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 2011), 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.[8] Therefore, the findings in this paper are also of interest to the literature on the real effect of political economy on financial markets. To the best of our knowledge, this is the first study that indicates that political uncertainty affects public debt financing costs.

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

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

[8] 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.

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 a state's budgeting process. There is a large body of literature examining the interaction between institutions and the real economy.[9] 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 examines the interaction between state fiscal and budgetary institutions and elections, and how this interaction impacts offering yield. Section 6 identifies the mechanisms through which political uncertainty affects offering yield. Section 7 presents a set of robustness checks and additional tests. Section 8 concludes. Variable definitions, variable construction, and data sources are summarized in Appendix A.

2 Data and Summary Statistics

2.1 Municipal Bond Sample

We collect municipal bond issuance information from two data sources. We extract a sample of bonds issued between 1990 and 2010 from Mergent's Municipal Bond Securities Database (MBSD).[10] The basic unit of observation in the MBSD is a tranche. Different tranches are often grouped

[9] 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, 2011).

[10] Conversations with the data vendor convince us that MBSD's coverage is substantially complete after 1990.

together into issues or packages. One issue usually consists of multiple tranches with different maturity dates, coupon rates, offering yields, and credit enhancement features, whereas different tranches of the same issue share common features such as issuer, underwriting syndicate, and offering date. Similar to the common practice in studies of syndicated loans, we construct issue-level attributes using tranche-level characteristics. Specifically, for continuous variables, such as offering yield, coupon rate, and maturity, we estimate 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. Appendix A describes these bond attributes. Our original sample contains $2,565,422$ tranches from $270,133$ issues.

While the MBSD has comprehensive coverage and detailed information on bond attributes, one unfortunate drawback of the database is that it provides only the most recent bond ratings, not the original ratings at the time of issuance.[11] Therefore, we augment MSBD data with the Global Public Finance Database (GPFD) from the Security Data Corporation (SDC).[12] A few prior studies utilize the SDC to collect a municipal bond sample (Butler 2008; Butler, Fauver, and Mortal 2009). With the SDC sample, we identify a rating as an original rating if the rating date is prior to or on the offering date. We then augment the missing ratings using the rating information from the SDC database. We match the MBSD with the SDC using the issuer's CUSIP, bond offering date, bond offering amount, and the states of issuers. We further check the quality of the match using dated date, delivery date, and tax status. We combine the three rating agencies' ratings in the following priority order: Moody's, S&P's, and Fitch's. If rating information is still not available, the bond is coded as "not rated."

We restrict our sample to tax-exempt municipal bonds and exclude bonds subject to state and/or federal tax. We exclude Build American Bonds (BABs), anticipation notes, certificates, and other types of non-standard bonds. Our final sample includes 121,503 issues, among which 60,228 (49.57%) issues are matched with the SDC database.

In some of our tests, we collect yield information from the Fair Value Municipal Bond Index

[11] Comparing municipal bonds included in the SDC with those included in the MBSD but not in the SDC, we find that the SDC contains relatively high quality municipal bonds. The SDC sample includes more general obligation bonds, insured bond, and bonds with additional credit enhancement, and fewer non-rated bonds. Bonds in the SDC are associated with shorter maturity, lower yield, higher ratings, and smaller offering amounts.

[12] We attempted to gather historical rating information by contacting our data vendor, as well as all three major rating agencies. Unfortunately, we are unable to obtain historical bond-level rating information for our sample period.

provided by Bloomberg. For each state, Bloomberg Fair Value Municipal Bond Indices are further grouped by maturities, ranging from 3 month to 30 year. Not all state-maturity indices have valid data each month. We choose indices from 19 states with maturities of 1 year, 5 year, 10 year, and 30 year to ensure consistent coverage throughout the sample period from 1996 to 2010.[13]

From the Municipal Security Rulemaking Board (MSRB), we obtain trade by trade municipal bond secondary market 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. From the dataset, we estimate the total number of transactions as well as the number of net buys.

2.2 Gubernatorial Election Data

We hand-collect data on U.S. gubernatorial elections from various sources. The primary source of election data is Wikipedia.[14] We double check the quality of the data by cross-referencing it with other sources, state election commission websites, CNN, and Factiva newspaper archives. In the majority of the states, gubernatorial elections take place every four years; the exceptions are New Hampshire and Vermont, where elections take place every two years.[15] An interesting feature of the data 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. We collect information about incumbent governors and their political party affiliations, and candidates and their political party affiliations.

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. 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. Most states have fiscal year endings in June, although there are a few

[13] 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 01/1996. CT, VA, WA, and WI start coverage on 08/1996, 10/1996, 03/1998, and 04/1997, respectively.

[14] The Wiki's website is http://en.wikipedia.org/wiki/List_of_elections_in_the_United_States.

[15] 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.

exceptions. 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 the election year, with the sole exception of Louisiana in 1999.[16] In summary, our election period is mainly defined as the period between July and October during an election year.

Foreshadowing some of our later discussions in the robustness checks, we also experiment with different definitions of the election period. For example, we defined the election period as three months before the election, or 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.[17]

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. *Governor Authority* describes the power of the governor in determining the state budget. *Governor Veto* describes the governor's veto power in the budgeting process. *Debt Limits* is an indicator taking the value of one if there is a limit on the amount of general obligation bonds. The details of construction of these variables are provided in Appendix A.

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

[16] 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.

[17] We also consider some additional election related events. Specifically, we include a Presidential election year fixed effect. Our results are robust to these additional fixed-effect controls.

(NCSL), and (2) fiscal institutional data provided in Poterba and Rueben (1999).

From the U.S. Census Bureau, we collect the "Composition of State Legislatures by Political Affiliation" between 1990 and 2000. We create a variable, *Party Control*, that equals one if the controlling party in both the state's upper and lower houses is the affiliated party of the incumbent governor, and zero otherwise.

2.4 Other Control Variables

We take into account a large number of state-level attributes as control variables. First, using state government finance data from the Government Division of the U.S. Census Bureau, we consider the state's fiscal status. State-level annual GDP data and quarterly personnel income data are obtained from the U.S. Bureau of Economic Analysis (BEA). The monthly unemployment rate is from the U.S. Bureau of Labor Statistics (BLS). The monthly coincident economic activity index, the leading index of economic activity, and the quarterly housing index are extracted 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.

We further control for state-level education and local newspaper circulation. They are collected from the 2000 U.S. census data. Following Butler et al. (2009), we control for corruption-related agency issues, measured by the Public Integrity Section (PIN), collected through the website of the U.S. Department of Justice (DOJ).

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 TAXSIM, provided by the National Bureau of Economic Research (NBER).[18]

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 defined 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

[18] The website of the TAXSIM is http://www.nber.org/~taxsim/

annually updated state ratings from the "Statistics Abstract of the United States: State and Local Government Finance and Employment" provided 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, in our regression analysis, we use the quarterly implied state ratings. Nevertheless, our results are robust to the other alternative.

We match bond issues with the most recent state-level economic variables. The rationale is that we want to incorporate publicly known economic information at the time of bond issuance. We match each bond with one-month (one-quarter, one-annual) lagged macroeconomic variables, depending on the frequencies of these variables. For instance, we match bonds with the previous month's unemployment rate, as state-level unemployment rates are available monthly, and we match bonds with the previous year's real GDP, as GDP is available annually.

2.5 Descriptive Statistics

Table 1 provides descriptive statistics of municipal bonds in our sample. Panel A summarizes bond issuance activities by states. Municipal bond issuance differs across states. In our sample, 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). In terms of the total dollar amount of issues in the period between 1990 and 2010, 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 the 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. 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 average highest unemployment rate are Alaska (6.98%), California (6.86%), Oregon and Michigan (both 6.66%). North Dakota, South Dakota, Nebraska, Iowa, and Virginia have average unemployment rates below 4%.

Insert Table 1 About Here

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, and time fixed effects.

Insert Figure 1 About Here

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.

In our sample, average yield to maturity is 4.42%, and the time to maturity ranges from 1 month to 1202 months. 52% of bonds are "high yield" bonds (i.e., bonds with credit ratings below investment grade, or unrated), 56% of bonds are callable bonds, 39% of bonds are rollover bonds issued to refund previous bonds. Our sample composition is very similar to previous studies

(Novy-Marx and Rauh 2011).

In our sample, 49% of bonds are issued by states during the period when GAAP-based budgeting is adopted, and 16%, 44%, and 74% of bonds are issued by states when revenue limits, spending limits, and debt limits are adopted by states, respectively.

Insert Table 2 About Here

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 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. High yield 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 Borrowing Costs

This section investigates the impact of gubernatorial elections on a state's financing costs, measured by municipal bond 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 do bonds issued during non-election periods.

3.1 Empirical Models

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, reflects the financing costs of municipal bond issues.

The set of controls are mainly 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 bond-specific attributes. 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 macroeconomic and demographic variables, such as the state GDP and population growth, and state government financial conditions. Bond-level control variables include maturity, offering method, ratings, and credit enhancement, among others. All regression models include year fixed-effects (γ_t) and state fixed-effects (α_j). In addition, we account for potential seasonal effect by adding monthly dummies m_k, for $k = 1, 2, ..., 12$.[19]

The main independent variable of interest is $Election_{jt}$, the election period dummy, 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 period leading up to the election, controlling for state-level and bond-issue-level characteristics. Following Petersen (2009), we compute heteroskedasticity-consistent standard errors clustered by state.[20]

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. In order to correct for such a bias, and to better reflect the issuance activities by states, we implement a weighted least squares (WLS) regression approach. In these WLS regressions, we use the probability of each state entering our sample as the weight. In other words, issuance activity

[19] We find that there exists a seasonal effect in municipal bond issuance. The month with the highest frequency of issues is June, which is the fiscal year ending month for most states. Bonds issued at the end of the calendar year are associated with slightly higher yields and longer maturities than bonds issued at the beginning of calendar year. Therefore, we remove the seasonal effect by adding monthly dummies.

[20] 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.

by state is the weight in these regressions. We also consider the feasible generalized least square regression (FGLS) and OLS without weighting adjustment as additional robustness checks. Results are robust to these alternatives.

3.2 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 show 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 spread. We remove the seasonal effect by regressing the offering yield spread over 12 monthly dummies. This graph shows the same pattern as in Panel A with an increase of yield spread 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 at the beginning of November, we observe an increase of offering yield spread before the election (from April to October) and a drop when election was finished. In contrast, we do not observe this pattern in years when there is no elections, as shown in Panel D. Hence, this preliminary evidence suggests that election has a positive impact on offering yield of municipal bonds.

Insert Figure 2 About Here

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 (significant at the 1% level).

Insert Table 3 About Here

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, significant at the 1% level), have slightly longer maturities (by 3 months, significant at the 1% level), and incur higher issuance costs measured by the gross spreads (by about 23 basis points, significant at the 10% level). However, municipal bonds issued during election periods do not have lower ratings.

In terms of the difference in sample compositions, bonds issued during election periods are slightly more likely to be general obligation (GO) bonds, bonds with insurance features, but less likely to be associated with additional credit enhancement.[21]

3.3 Regression Results

Table 4 studies the impact of elections on municipal bond offering yields. All specifications include state-, monthly-, and year-fixed effects. We further include the capital purpose fixed effect in all regressions, except the regression in column (7), where we examine "rollover bonds."

Column (1) reports the results from the baseline model, which includes the maturity-matched 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 (significant at the 1% level).

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 transfer policies. Motivated by their work, we include an indicator variable, *Term Limits or Retirement*, in the baseline model. The indicator variable takes a value of one if

[21] 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.

the incumbent governor faces a term limit or retirement, and is zero otherwise. The coefficient estimate of *Term Limits or Retirement* is 0.033 (t-statistics = 2.31), which implies that municipal bonds issued during a governor's known last term command 3.3 basis points higher offering yield.

Insert Table 4 About Here

In columns (2) to (4), we sequentially include additional variables of bond characteristics, state macroeconomic conditions, and state institutions. 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 7.2 basis points (column 4).

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.

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 reduces its borrowing cost. A one standard deviation increase in the leading economic index (1.44) reduces the offering yield by 11 basis points. Moreover, a state with a larger fraction of government debt outstanding to state gross domestic product (Debt/GDP ratio) pays higher borrowing costs. 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.[22,23]

In column (4), all variables related to state institutions have the expected signs, although only

[22] 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.

[23] 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.

two of them are statistically significant. First, a state adopting generally accepted accounting principles (GAAP) in its budgeting process pays 11 basis points less (t-statistics = -2.61) when it issues municipal bonds. This is consistent with the argument that accounting information transparency reduces borrowing cost.[24] Second, a state with revenue limits pays more, as the limit on revenue may curtail a state's ability and flexibility to serve its debt obligation, and therefore increase a bond's default risk.

In column (5), we repeat the specifications from column (3), but include only a subsample of general obligation (GO) bonds. The main effect of elections on offering yields remains unchanged, both in magnitude and statistical significance. As one expects, the impact of state institutions is more pronounced for general obligation bonds. In particular, Party Control, an indicator variable taking value of one if the controlling party in both the state's upper and lower houses is the affiliated party of the incumbent governor, is negatively related to offering yield but only significant at a 10% level.

In column (6), 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.[25] In line with their estimates, about 47% of the municipal bonds in our sample are insured. The point estimate of election on offering yield is 0.066 (t-statistics = 6.55), which is similar to those obtained from previous specifications. This piece of evidence suggests that, to the extent that default risk is muted by bond insurance, the increase in municipal bond offering yields is less likely to be driven primarily by the increase in default risk during the election period.[26]

[24] See Gore, Sachs, and Trzcinka (2004) for a detailed discussion of government accounting and disclosure practices, and their potential impact on municipal financing costs.

[25] 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 (2011) 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.

[26] We defer our discussions about column (7), a subset of "rollover bonds," until Section 6.

4 Elections and Economy Conditions

In this section, we examine whether the impact of political uncertainty induced by election varies with economic conditions. Pastor and Veronesi (2011a, 2011b) provide a theoretical framework that demonstrates 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 change: uncertain policy changes are more likely to occur during economic downturns, and investors demand higher risk premiums as compensation. Taken together, our second 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.

4.1 Empirical Models

To test the second hypothesis, we use the interaction term between the election dummy and an indicator of economic conditions. Since general economic conditions would affect the impact of control variables on the borrowing cost of municipal bonds (see detailed discussion below), we employ a full-interaction model. We interact the indicator of economic conditions with all independent variables. We want to emphasize that, in our empirical models, the identification does not come from the state of the economy. It is both unsurprising and uninteresting to see that the average offering yield is higher during an economic downturn. Instead, the identification comes from elections coincident with economic downturns. We are interested in showing that political uncertainty effects vary with economic states. 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 economic conditions is "bad", and zero otherwise. We are particularly interested at the coefficient β_1. A positive and significant β_1 suggests that the effect of $Election_{jt}$ during the "bad" state of the economy is significantly different from that same effect during the "good" state of the economy. In particular, a positive estimates of β_1 would suggest that the impact of political uncertainty induced by the

forthcoming gubernatorial elections on the public debt financing cost is more pronounced when the economy is in a downturn. For the ease of comparison, we also examine the election effect in "good" and "bad" economic states separately.

We consider several alternatives to identify economic states. First, we 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 is zero otherwise. In our empirical setting, one potential drawback of classifying economic states based on NBER business cycles is that it reflects national economic conditions. While state economic conditions are closely related to the overall national economy, this classification ignores cross-state variations. On the other hand, if state-level political uncertainty affects state economy, then the state-level economic condition does not constitute an exogenous source of variation to examine political uncertainty impact on public debt financing costs.

Second, we consider the state-level unemployment rate to differentiate economic upturns and downturns. We define an "economic upturn" (and "economic downturn") as the time 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 "economic upturn" (and "economic downturn") as the time 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 upturns and downturns, 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 economic downturns, and 6.3 basis points (t-statistics = 4.61) during economic upturns. 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 economic downturns, and 2.5 basis points (t-statistics = 2.28) during the economic upturns. Finally, when we classify economic conditions based on state-level economic leading indices, we find that the impact of Elec-

tion on offering yields is 12.8 basis points (t-statistics = 4.21) during the economic downturns, and 1.9 basis points (t-statistics = 0.74) during economic upturns. Overall, the results confirm that the impact of political uncertainty is more pronounced during economic downturns. Interestingly, in untabulated analyses, we also 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.

Insert Table 5 About Here

To test the statistical significance of the differential impact of political uncertainty on offering yield, we estimate a full-interaction model. Specifically, we multiply different economic condition indicators with all independent variables because the marginal effects of control variables on offering yields vary across economic conditions. 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 downturns and upturns of the economy 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 of the theoretical models of Pastor and Veronesi (2011a, 2011b). As predicted by these models, political uncertainty has a much stronger effect on offering yields during economic downturns.

5 Elections, State Finance, and Fiscal Institutions

In this section, we study whether the state-level status of financing and institutional features (i.e., "institutions") mitigates or exacerbates the impact of political uncertainty on bond offering yields.

For the status of state financing, we consider government debt out-standing to state gross domestic product (Debt/GDP) ratio. Consistent with the idea that higher government leverage measured by debt/GDP ratio may contribute to higher likelihood of default, Table 4 shows that

states with higher levels of debt/GDP ratios indeed require higher offering yields. 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.

We focus on three types of state-level institutions, and in particular their roles during elections. The first is a set of "*fiscal restrictions*" that measure the degree of restrictions on the budgeting process, including a state's adoption of generally accepted accounting principles (GAAP), a balanced budget requirement, debt limits, expense limits, tax-raising limits, and spending limits. Because these institutions impose restrictions on policy changes, they may mitigate the adverse impact of election-related political uncertainty on public debt financing costs. The second type of institutions is "*governor's power*," which measures the power of the governor to determine the state budget. The more powerful a governor is in the budgeting process, the more uncertainty is induced by gubernatorial elections. We expect that this type of institution might amplify the effect of an election on public debt financing cost. The last type of institution we consider is "*political institutions*." We focus on political party control in the state legislature. Poterba (1994) suggests that a state with a single party controlling the legislature can respond to a fiscal crisis with speedy policy adjustment. Similarly, it is relatively easy for the governor to change policies if the controlling party is his/her affiliated party. Hence, we expect that "party control" can amplify the uncertainty of elections, and increase borrowing cost. In summary, the impact of political uncertainty induced by gubernatorial elections on public debt financing cost is less (more) pronounced in states with more (less) institutional restrictions on government behavior.

5.1 Regression Models

Our regression model is specified as follows:

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

where Z_{jt} is the state-level characteristics of interest. Our interest is β_1 , which indicates whether the institutions will mitigate or exacerbate the impact of political uncertainty on offering yields. As

mentioned above, when Z_{jt} is proxied by "fiscal restriction" we expect a negative β_1 , whereas when Z_{jt} is proxied by "governor power" or "party control" we expect a positive β_1. Hence, a positive (negative) β_1 indicates that these institutions exacerbate (mitigate) the impact of gubernatorial elections on municipal borrowing costs. 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.

In Table 6, for the status of state finance variables, we consider that an indicator equals one if the state debt to GDP ratio is above its *historical* median; it is zero otherwise. As for the state institutional variables, we consider the adoption of GAAP-based budgeting, revenue limits, spending limits, tax-increase limits, debt limits, a balanced-budget mandate, the governor's authority power, the governor's veto power, and the indicator of party control. We only report variables which are statistically significant at the 10% level or better in Table 7.

Insert Table 6 About Here

The first column in Table 6 examines whether a state with a higher ratio of debt outstanding to the state gross domestic product (GDP) is subject to a more adverse impact of political uncertainty during elections. The estimate shows that a state with a debt to GDP ratio above its historical median faces an additional 7.6 basis points (t-statistics = 2.88) higher offering yields during elections. However, a higher level of state debt to GDP ratio by itself does not translate into higher municipal bond borrowing costs on average.

Columns (2) to (6) investigate the effect of state budgetary institutions. Several interesting features emerge. First, certain budgetary institutions influence public financial costs, measured by offering yields, during both election periods and non-election periods. One such institution is the adoption of generally accepted accounting principles (GAAP) during the budgeting process. The adoption of GAAP reduces offering yields by 11.5 basis points; it also mitigates the adverse impact of political uncertainty induced by elections by 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 period. For example, when a state adopts revenue limits, offering yields increase by 12.9 basis points (t-statistics = 2.04). However,

the revenue limits do not affect the impact of elections on borrowing costs, as shown in column (3). Similarly, the veto power of the governor in the budgetary process reduces the borrowing cost of municipal bonds on average but does not affect the impact of elections, as shown in column (6). In contrast, some state institutions, such as spending limits or tax-increase limits, negatively attenuate offering yields in general, but the effects are not statistically significant. Interestingly, these institutions have incremental effects on offering yields during election periods. Specifically, a state with spending limits on average experiences about 4.3 basis points lower financing costs, while a state with tax-increase limits on average pays 3.3 basis points less during the election period. Overall, these findings suggest that the impact of state institutions on public financing costs may be time variant, and depends on the context of political processes, such as elections.

6 How Does Election Impact Public Financing Cost?

In this section, we attempt to identify the mechanisms through which the political uncertainty induced by elections affects the borrowing costs of municipal bonds. We organize our discussion from the perspectives of the supply and demand sides. On the supply side (i.e., municipal bond issuers), we discuss two hypotheses: (1) the "endogenous timing" hypothesis, which emphasizes the endogenous timing of municipal bond issuance during elections, and (2) the "opportunistic political cycles" hypothesis, which focuses on politically motivated economic policy agenda and debt issuance decisions. On the demand side (i.e., municipal bond investors), we examine the "uncertainty aversion" hypothesis, which suggests that the effects of elections on public financing are primarily driven by the investors' uncertainty aversion.

6.1 Supply Side: Endogeneous Timing of Bond Issuance and Elections

From the supply side perspective, one possible explanation is that issuers endogenously choose the timing of bond issuances (i.e., the "endogenous timing" hypothesis). The crux of the hypothesis is that faced with political uncertainty, firms can 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, an analogous argument is that issuers may delay bond issuance until after the election when the uncertainty is resolved.

The direction of timing endogeneity's impact on offering yields is not entirely clear. On the one hand, one can make an argument that our estimate may overstate the impact of political uncertainty on public debt financing costs. Let us assume issuers have a menu of bond issuance choices. Some bonds must be offered immediately to fulfill urgent public financing objectives or a politician's *quid pro quo* relationship with certain private sector interest groups (such as local business, underwriters, etc.). Moreover, for some exogenous reasons unrelated to political uncertainty, these bonds command higher offering yields. Other bonds should be offered but do not have to be offered immediately; the latter group of bonds commands lower offering yields. In absence of political uncertainty, all bonds are offered. During election, however, only the former is offered. Therefore, though higher offering yields still reflect political uncertainty induced distortion of public financing, it does not directly imply higher financing costs. On the other hand, to the extent that we observe bond issuance during election periods, and the issuance amount is not statistically different from amounts in non-election periods, there might be a subtle composition effect. That is, bonds offered during an election period may be a subset of bonds with yields *less sensitive* to political uncertainty. Thus, our estimate is likely to understate the impact of political uncertainty on public debt financing costs.

We attempt to address the endogeneity problem in two ways. First, in column (7) of Table 4, we focus on a subsample of "rollover bonds." Rollover bonds are issued to refund previous bond issues, which were 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, and is less likely to be postponed. We find that the impact of elections on offering yields is stronger for rollover bonds. 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. The effects of control variables on rollover bonds are similar to those in other specifications.

Second, we can directly examine a state-level municipal bond index trade yield during an election period. For instance, as the Bloomberg Fair Value Muni Index consists primarily of municipal bonds already traded on the secondary market, its yield reflects secondary market pricing, and is less likely to be affected by the endogenous timing of bond issuance. There are a couple of potential imitations associated with this methodology. First, we only have continuous monthly bond index

series for 19 states, and the sample only starts in 1996 for the majority of the series. Second, municipal bond markets are illiquid, and the market price information may be less reliable than the price information from the primary market.[27] Thus data limitations reduce the statistical power of our empirical tests, and results from the secondary market should be viewed as complementary evidence.

Insert Figure 3 About Here

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 spread. 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 provides the time-series evolution of secondary market yield spreads over calendar months during election years (Panel C) and non-election years (Panel D). Similarly to Figure 2, we observe an increase of yield spreads before the elections and then a drop when elections are finished in Panel C but not such as a pattern in Panel D.

Insert Table 7 About Here

Table 7 examines how elections impact the yield of the state-level municipal bond index. The regression specifications are similar to (1), except we do not include 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,

[27] See Green, Li, and Schurhoff (2010), Green, Hollifield, and Schurhoff (2007a, 2007b), Harris and Piwowar (2006), and Schultz (2011) for detailed discussions about municipal secondary market structures, transaction costs, illiquidity, and transparency.

reported in Column (4) from 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, secondary market evidence suggests that endogenous timing of issuance does not explain the escalated debt financing costs prior to elections.

6.2 Supply Side: Opportunistic Political Cycles and Elections

The second supply-side explanation is the "opportunistic political cycles" hypothesis (Nordhaus 1975; Persson and Svensson 1989; Besley and Case 1995; List and Sturm 2006, among others). Under this hypothesis, incumbents try to maximize their chance of being re-elected by adopting policies that generate low unemployment and high economic growth prior to elections, followed by economic contractions afterward. For example, incumbents may reduce taxes and raise public expenditures, financed by public debts. These policies may jeopardize the health of public finance and hurt long-term economic growth and stability. Consequently, investors demand higher risk premiums to purchase bonds issued by governments facing coming elections.

To test the opportunistic political cycle hypothesis, we examine the impact of gubernatorial elections on state government fiscal policies using state government finance data collected from the U.S. Census Bureau. Specifically, 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 and non-election fiscal years. We find that there is no significant change in these policy instruments in the years leading up to elections. We further examine whether bond issuance increases prior to elections, using various definitions of election periods (as shown in Table 9 below). We find little evidence of significant changes in public debt offering amounts in response to elections.

Besley and Case (1995) argue that governors who face term limits behave differently from those who do not. We find some evidence consistent with their observations. Among all policy instruments we consider, there is an increase of capital outlays by Democrat governors who face term limits or retirement. However, the effect of Democrat incumbents facing term limits or retirement does not vary across election cycles. That is, there is no evidence that Democrat incumbents are particularly motivated to manipulate policies during an election period, which is what is crucial

for the opportunistic political cycle hypothesis to explain the observed empirical irregularities we identify.[28]

Overall, we find little evidence supporting the opportunistic political cycle hypothesis in the context of U.S. gubernatorial elections. While our results seem disappointing, they are consistent with prior empirical literature on opportunistic political cycle hypotheses. 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."[29]

6.3 Demand Side: Uncertainty Aversion and Elections

We consider two non-mutually-exclusive demand-side effects caused by municipal bond investors' aversion to political uncertainty. First, investors demand extra compensation for bearing political uncertainty, a channel envisioned by Pastor and Veronesi (2011a, 2011b). During an 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 completely resolves, while uncertainty about the newly elected official's policy preferences and the impact of these policies remain. Our empirical framework and tests focus on the first type of uncertainty caused by elections. While other types of uncertainties are clearly important, our framework does not allow us to draw any conclusions about them.

The second channel is similar in spirit to the prototype model of Bernanke (1983). Facing escalated uncertainty prior to an election, a firm can exercise the option to wait. Similarly, encountering uncertainty, an investor may choose to reduce participation or even not to participate in the market.[30] 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

[28] For brevity, we do not tabulate these results. They are available upon request.

[29] Prior literature produces mixed results across different countries, and the evidence from developed democratic countries is particularly weak. In fact, Besley and Case (2003) find similar evidence using longer time series between 1950 and 1997 (see Table 13 in particular). There are some notable exceptions: Akhmedov and Zhuravskaya (2004)on Russia, and Pettersson-Lidbom (2001) on Sweden.

[30] A key ingredient of the model in Bernanke (1983) is irreversible investment, which makes the option to wait valuable. For municipal bond investors, as long as trading costs of municipal bonds are sufficiently high, a similar argument goes through. Given the illiquidity of municipal bonds, this is a reasonable assumption.

and provide liquidity demand compensation for this provision.

We test the second channel using detailed trade by trade transaction data from the municipal bond secondary market. 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 time 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 state-level total number of customer trades ($\#TotalTrades$) and the number of net customer buys ($\#NetBuys$). The variable of interest is *Election*, which estimates whether there are any demand side changes in the secondary market.

When we estimate total customer trades and net customer buys, we also make a distinction between newly issued bonds and seasoned bonds. On any trading day, if a bond was issued at least thirty days earlier, it is considered a seasoned bond; otherwise, it is considered a newly issued bond.

For a newly issued bond, underwriters and dealers contact the potential buyers to place the 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 do not reflect such demand side effects. After initial placement of a municipal bond, investors usually hold it for long-term investment purposes. Thus most of the customer transactions of a seasoned bond are *buyer-initiated* (Schultz, 2012). 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, there is an important conceptual distinction between a newly issued bond and a seasoned bond. To identify demand side effects, we focus on seasoned bond trading, although we report the trading of newly issued bonds and the trading of all bonds.

Insert Table 8 About Here

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 transactions of municipal bonds in the secondary market suggests that the declining demand due to uncertainty aversion is the driving force of the escalated offering yields during the election periods.

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. As expected, the spike in offering yields prior to the election reverts back after the election.

Insert Table 9 About Here

In addition, we consider other econometric specifications. Rather than weighted least square regressions, we consider the ordinary least square (OLS) regression and the feasible generalized least square (FGLS) regression. Our main results do not change. We do not report them here to preserve space but they are available upon request.

To ensure that our results are not driven by 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.

In untabulated analyses, we also split the sample into quartile portfolios based on offering size, or time to maturity, then estimate the baseline model, shown in column (1) of Table 9. The impact of elections on offering yields exists among municipal 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.

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 status, and state budgetary institutions.

First, we find that the offering yields of municipal bonds issued during election periods are six to eight basis points higher than those of bonds issued during non-election periods. Bonds issued in states with an incumbent governor facing term limits or retirement are associated with offering yields of an additional three basis points higher.

Second, the impact of political uncertainty on public financing costs varies with local economic conditions. Consistent with the theoretical prediction by Pastor and Veronesi (2011a, 2011b), the impact of elections on the borrowing cost of municipal bonds is more pronounced during local economic downturns.

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

Finally, we explore the mechanisms through which political uncertainty affects public financing costs. We explore the perspectives of both the demand side and the supply side. Evidence from the transactions of municipal bonds in the secondary market suggests that the declining demand due to investors' uncertainty aversion is the driving force behind the escalated offering yields during the election periods.

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 or liquidity pool, similar in spirit to the *CommonMuni* proposed in Ang and Green (2011)? How can we solve the adverse selection and moral hazard problems if we implement such a co-insurance scheme? We leave these questions for future research.

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Figure 1: Descriptive Statistics of Municipal Bonds over Time

This figure presents the average offering yield, and yield spread over the sample period between 1990 and 2010. Yield spread is the difference between offering yield and maturity-matched benchmark Treasury bond yield.

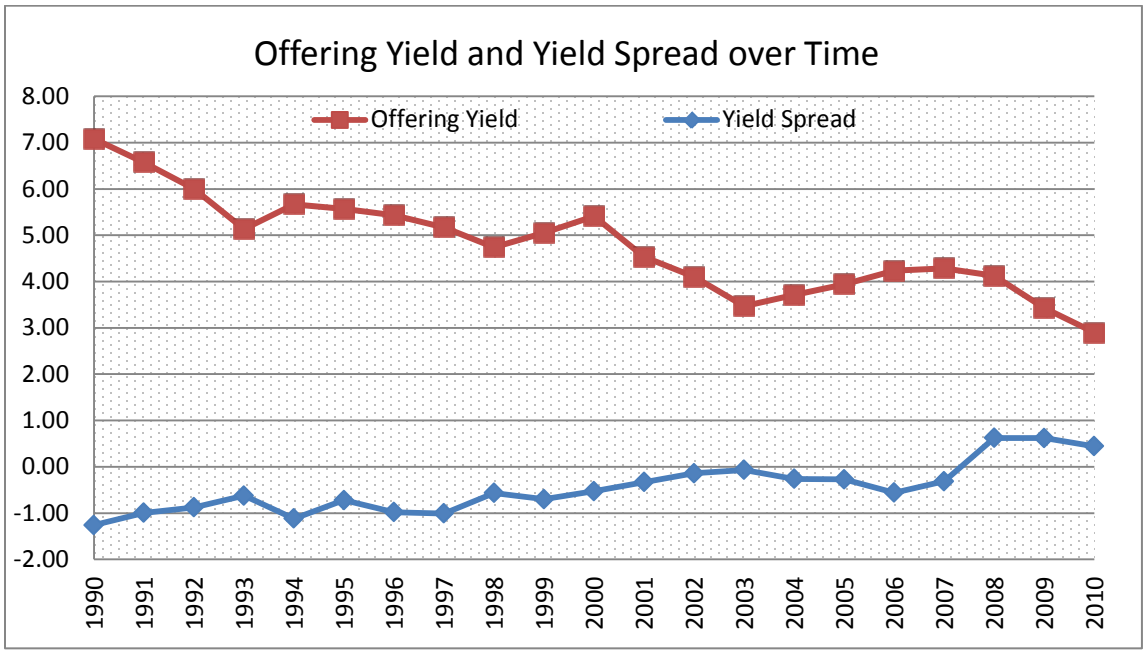

Figure 2: Bond Yield during the Election Period

Panels A and B present the yield spread over the period of 6 months prior and after the election date. The yield spread is defined as the difference between offering yield and the yield of benchmark Treasury bond with the same maturity. The X-axis presents the time to election. Time $t = ELCT$ indicates the month of election $t = -1M$ indicates 1 month to election, and $t = 1M$ indicate that one month after the election. Panels C and D present respectively the yield spread over calendar month in the years with or without elections. The elections are usually conducted in November.

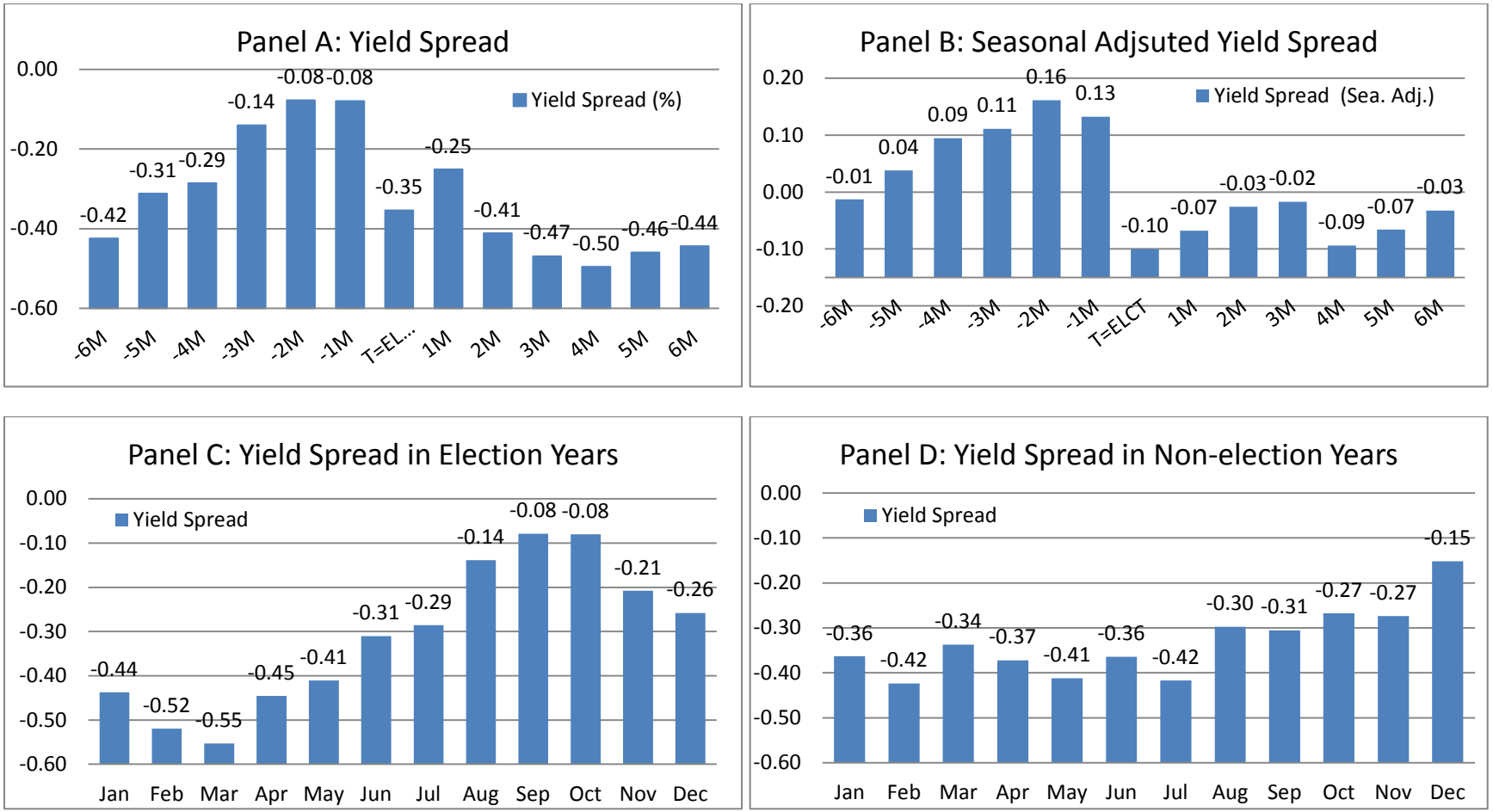

Figure 3: Impact of Elections on State-Level Municipal Bond Index Yield Spreads

Panels A and B present the state-level municipal bond index yield spreads of different maturities (1-, 5-, 10-, and 20-year) over the period of 6 months prior and after the election. Panels C and D present the yield spread in election and non-election years respectively. The yield spread is defined as the difference between municipal bond index market yield and the yield of benchmark Treasury bond with the same maturity. The X-axis presents the time to election. Time $t = ELCT$ indicates the month of election, $t = -1M$ indicates 1 month to election, and $t = 1M$ indicate that one month after the election. Elections are usually conducted in November.

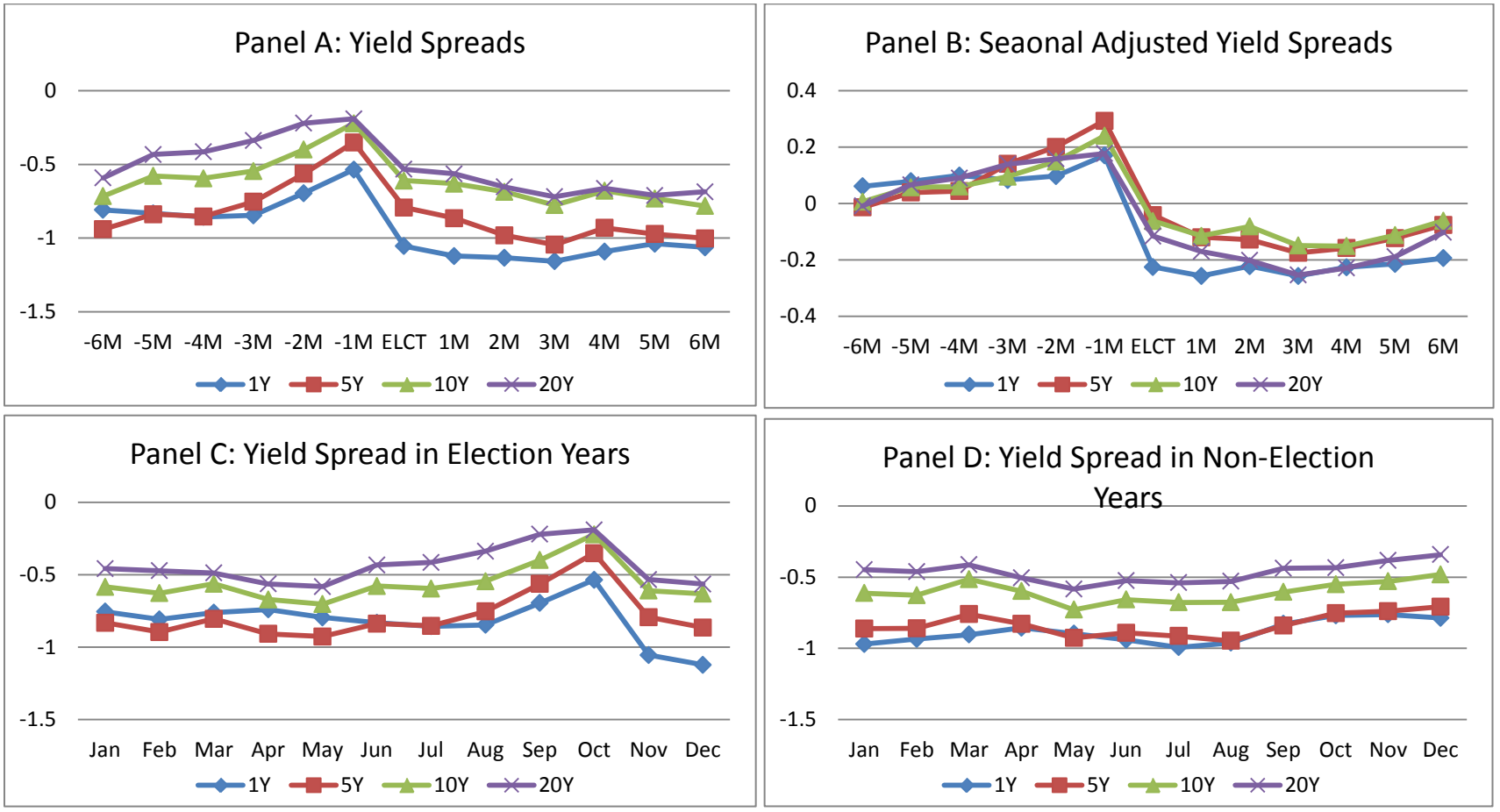

Table 1: Descriptive Statistics of the Municipal Bonds Sample

This table presents the descriptive statistics of the tax-exempt municipal bond sample. The sample period is from 1990 January to 2010 November. *Yield* is the offering yield in percentage, *Offering Amount Per Issue* is the average offering amount per issue in US$ millions, *Total Offering Amount* is the sum of offering amount per state in US$ millions, *Maturity* is the time to maturity in months, and *Real GDP* is in US$ millions. These 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 of this table provides the summary statistics of selected variables used in regressions. Panel B presents the correlation coefficients of selected variables, with bold numbers indicating statistical significance at the 1% level. The definitions of all variables are provided in Appendix A.

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
Democrat	121,503	0.40	0.49	0	1
Election Interval	121,503	3.95	0.31	1	4
Margin	121,503	0.16	0.13	0.00	0.58
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
Gross Spread	27,193	9.72	5.58	0.01	30
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
Callable	121,503	0.56	0.33	0	1
High Yield	121,503	0.52	0.50	0	1
Rollover Bond	121,503	0.39	0.49	0	1
Pre-refunded Bond	121,503	0.16	0.37	0	1
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
Party Control	121,503	0.38	0.48	0	1
Budget Balance	121,503	2.33	0.80	0	3
GAAP	121,503	0.49	0.50	0	1
Governor Authority	121,503	2.08	0.91	0	4
Governor Veto	120,396	2.27	0.90	0	4
Revenue Limit	121,503	0.16	0.36	0	1
Spending Limit	121,503	0.44	0.50	0	1
Debt Limit	120,396	0.74	0.44	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	
High Yield	(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 presents the T-test of bond characteristics between election period and non-election period. Election period used here is the *Election Period-Fiscal* defined as the period before the upcoming election date and after the current fiscal year ending date. Columns (1) and (2) report standard deviations in parenthesis, and column (3) presents the difference between (1) and (3) with t-statistics in the parenthesis.

	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	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)
High yield	0.524	0.487	0.037***
	(0.499)	(0.500)	(6.774)

Table 4: Impact of Elections on Municipal Bond Offering Yields

This table provides the estimated coefficients of weighted least square regressions, with the weight as the frequency of bond issuance per state in our sample. Columns (1) to (4) report the regressions with various control variables, and columns (5) to (6) present results using general obligation bonds, insured bonds, and rollover bonds respectively. T-statistics, reported in the parentheses, are calculated based on standard errors clustered by states.

	Baseline	Bond Controls	State Controls	Institution Controls	G.O. Bonds	Insured Bonds	Rollover Bonds
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Election Period – Fiscal	0.081***	0.068***	0.070***	0.072***	0.071***	0.066***	0.082***
	(3.46)	(4.56)	(5.18)	(4.99)	(3.66)	[6.55]	(6.05)
Term Limited or Retired	0.033**	0.041**	0.038***	0.029*	0.023	0.020*	0.023**
	(2.31)	(2.61)	(3.01)	(1.90)	(1.60)	[1.72]	(2.24)
Benchmark T-bond Yield	0.951***	0.579***	0.594***	0.593***	0.587***	0.600***	0.617***
	(89.1)	(42.9)	(42.9)	(44.4)	(21.2)	[27.1]	(47.8)
Total Income Tax Rate	0.025	0.004	-0.028*	-0.050**	-0.069**	-0.03	-0.063**
	(0.77)	(0.17)	(-1.80)	(-2.56)	(-2.41)	[-1.49]	(-2.42)
Term Spread	-0.002	0.045***	0.046***	0.050***	0.051***	0.043***	0.038**
	(-0.22)	(4.07)	(4.26)	(4.56)	(3.29)	[3.67]	(2.41)
Log (Offering Amount)		-0.043***	-0.044***	-0.044***	-0.027***	0.002	-0.026***
		(-4.45)	(-4.43)	(-4.39)	(-6.43)	[0.26]	(-2.90)
Time to Maturity		0.004***	0.004***	0.004***	0.005***	0.004***	0.004***
		(26.6)	(25.7)	(25.9)	(11.0)	[25.5]	(18.0)
G.O. Bond		-0.124***	-0.124***	-0.125***	dropped	0.004	-0.100***
		(-6.21)	(-6.10)	(-6.18)		[0.28]	(-6.23)
Competition Offering		-0.117***	-0.110**	-0.109**	-0.02	-0.054**	-0.093**
		(-2.80)	(-2.66)	(-2.64)	(-0.38)	[-2.12]	(-2.23)
Insured Bond		-0.239***	-0.240***	-0.241***	-0.090***		-0.196***
		(-7.81)	(-8.00)	(-8.03)	(-3.63)		(-7.04)
Additional Credit		-0.171***	-0.166***	-0.166***	-0.130***	-0.053***	-0.137***
		(-3.16)	(-3.04)	(-3.08)	(-3.05)	[-3.87]	(-3.62)
Callable Bond		0.276***	0.279***	0.283***	-0.011	0.000	0.285***
		(7.31)	(7.65)	(7.65)	(-0.100)	[-0.0020]	(6.12)
High Yield		0.163***	0.165***	0.165***	0.087***	0.034***	0.131***
		(13.9)	(13.1)	(13.0)	(10.1)	[7.92]	(12.1)
Population Growth Rate			1.569	2.217*	1.399	1.206	-0.388
			(1.33)	(1.71)	(1.18)	[1.19]	(-0.39)
Log (Real GDP)			0.278	0.243	0.275	0.390**	0.061
			(1.30)	(1.61)	(1.32)	[2.04]	(0.62)
Unemployment Rate			0.023	0.026	0.015	0.023	0.004
			(1.03)	(1.06)	(0.58)	[1.01]	(0.27)

Economic Leading Index			-0.076***	-0.079***	-0.090***	-0.056***	-0.080***
			(-4.76)	(-4.90)	(-4.23)	[-4.02]	(-5.28)
Government GDP/ Total GDP			3.829*	5.310***	7.682**	4.680**	2.957**
			(2.01)	(2.78)	(2.44)	[2.33]	(2.08)
Debt/GDP Ratio			-1.265	-1.021	-0.647	-0.756	-0.31
			(-0.94)	(-0.80)	(-0.71)	[-0.90]	(-0.33)
Implied State Rating			-0.007***	-0.008**	-0.013***	-0.003	-0.003
			(-2.76)	(-2.20)	(-2.87)	[-1.04]	(-0.77)
Party Control				-0.011	-0.032*	-0.015	-0.004
				(-0.78)	(-1.94)	[-1.21]	(-0.42)
Budget Balance				0.025	0.045**	0.019	0.016
				(1.43)	(2.38)	[0.89]	(0.90)
GAAP				-0.110**	-0.117***	-0.112***	-0.075
				(-2.61)	(-3.12)	[-2.81]	(-1.34)
Governor Authority				0.003	-0.012	-0.01	-0.007
				(0.29)	(-1.17)	[-1.08]	(-1.06)
Governor Veto				-0.01	-0.009	-0.008	0.01
				(-1.38)	(-0.66)	[-0.82]	(0.91)
Revenue Limit				0.148***	0.092**	0.035	0.064**
				(3.96)	(2.03)	[1.20]	(2.38)
Spending Limit				-0.028	-0.034	-0.017	-0.012
				(-0.98)	(-1.02)	[-0.57]	(-0.25)
Debt Limit				-0.011	-0.032	-0.031	-0.015
				(-0.55)	(-1.31)	[-1.26]	(-0.72)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Capital Purpose Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yearly Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Monthly Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	No
Observations	115,632	115,511	115,511	114,409	53,660	54,357	43,996
R-squared	0.69	0.8	0.81	0.8	0.87	0.89	0.86

Table 5: Impact of Elections on Offering Yields Interacted with Macroeconomic Conditions

This table examines the interactive effect of macroeconomic conditions and political uncertainty on the borrowing cost of municipal bonds. Results are based on weighted least square regressions, with the weight as the frequency of bond issuance per state in our sample. Columns (1) to (3) use the NBER business cycle to determine the economic good (expansion) and bad (recession) periods. In Columns (4) – (6), a good (bad) period is defined as a period with a state-level unemployment rate below (above) its historical median. In Columns (7) – (9), a good (bad) period is defined as a period with a state-level economic leading index above (below) its historical median. Regressions are conducted with additional controls for bond characteristics and macroeconomic variables, as in Table (4). We multiply the economic indicator with all independent variables, and hence the dummy variable of the economic indicator is dropped due to multicollinearity. All regressions include a constant, state fixed effect, yearly dummies, monthly dummies, and dummies of capital purpose. T-statistics reported in the parentheses are based on standard errors clustered by states.

	NBER Business Cycle			Unemployment Rate			Economic Leading Index		
	Good	Bad	Interacted	Good	Bad	Interacted	Good	Bad	Interacted
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Election Period – Fiscal	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 Econ. Indicator			0.183***			0.073***			0.109**
			(3.05)			(3.66)			(2.36)
Bond Attributes Control	YES	YES	YES	YES	YES	YES	YES	YES	YES
Macroeconomics Control	YES	YES	YES	YES	YES	YES	YES	YES	YES
State Institution Control	YES	YES	YES	YES	YES	YES	YES	YES	YES
Capital Purpose Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES
Month Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES
State Fixed Effect	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: Impact of Elections Interacted with State Finance and Fiscal Institutions on Offering Yields

This table examines the interactive effect of the state financial condition and fiscal institutional factor with political uncertainty on the borrowing cost of municipal bonds. The estimated coefficients are from weighted least square regressions, with the weight as the frequency of bond issuance per state in our sample. The state indictor variable is *Debt/GDP Ratio* in column (1) and *State Tax Rate* in column (2). State institutional variables are *GAAP* in column (3), *Revenue Limit* in column (4), *Spending Limit* in column (5), *Tax Raise Limit* in column (6), and *Governor Veto* in column (7). Regressions are conducted with additional controls of bond characteristics and macroeconomic variables, as in Table (4). We did not include state institution control in regressions that examine the interaction term between election and institutions to avoid the multicollinearity. All regressions include a constant, state fixed effect, yearly dummies, monthly dummies, and dummies of capital purpose. T-statistics, reported in parentheses, are based on standard errors clustered by states.

	State Finance Indicators	State Institution Indicators				
	Debt/GDP Ratio	GAAP	Revenue Limit	Spending Limit	Tax Raise Limit	Gov. Veto
	(1)	(2)	(3)	(4)	(5)	(6)
Election Period - Fiscal	0.032*	0.094***	0.073***	0.091***	0.084***	0.076*
	(1.94)	(6.30)	(5.06)	(7.26)	(3.93)	(1.70)
State Indicators	-0.009	-0.115**	0.129**	-0.048	-0.057	-0.020**
	(-0.57)	(-2.23)	(2.04)	(-1.08)	(-1.25)	(-2.17)
Election x State Indicators	0.076***	-0.036**	-0.018	-0.043**	-0.033**	-0.001
	(2.88)	(-2.04)	(-0.72)	(-2.68)	(-2.29)	(-0.023)
Constant	Included	Included	Included	Included	Included	Included
Bond Attributes Control	YES	YES	YES	YES	YES	YES
Macroeconomics Control	YES	YES	YES	YES	YES	YES
State Institution Control	YES	NO	NO	NO	NO	NO
Capital Purpose Fixed Effect	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	YES	YES
Month Fixed Effect	YES	YES	YES	YES	YES	YES
State Fixed Effect	YES	YES	YES	YES	YES	YES
Observations	115,511	115,511	115,511	115,511	115,511	114,409
R-squared	0.81	0.81	0.81	0.81	0.81	0.80

Table 7: Impact of Elections on the State-Level Municipal Bond Index Yield

This table reports the impact of elections on the state-level municipal bond index yield. Column (1) reports the regression of the pooled sample of state-level municipal bond indices of different maturities. Columns (2) to (5) report the regressions of state-level municipal bond indices by maturities. The set of control variables is the same as in column (4) of Table 4. The sample period is from 1996 to 2010. T-statistics, reported in parentheses, are based on standard errors clustered by states.

	Pooled Across All Maturities	1 Year Bond	5 Year Bond	10 Year Bond	20 Year Bond
	(1)	(2)	(3)	(4)	(5)
Election Period - Fiscal	0.065***	0.040**	0.108***	0.056**	0.056***
	[2.95]	[2.27]	[3.26]	[2.50]	[3.25]
Term Limited or Retired	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 Control	YES	YES	YES	YES	YES
State Institutions Control	YES	YES	YES	YES	YES
State Dummies	YES	YES	YES	YES	YES
Yearly Dummies	YES	YES	YES	YES	YES
Monthly Dummies	YES	YES	YES	YES	YES
Maturity Dummies	YES	NO	NO	NO	NO
Observations	11,776	2,944	2,944	2,944	2,944
R-squared	0.864	0.954	0.902	0.901	0.904

Table 8: Impact of Elections on the Secondary Market Trading of Municipal Bonds

This table reports the impact of elections on the secondary market trading of municipal bonds. The dependent variable in columns (1), (3), and (5) is the monthly number of customer trades (in hundreds) within a state, and the dependent variable in columns (2), (4), and (6) is the monthly number of customer buy trades minus the total number of customer sell trades (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, which are defined as bonds issued at least 30 days prior. In columns (5) and (6), the sample of trades includes only newly issued bonds, which are defined as bonds issued during the previous 30 days. We only include tax-exempted bonds that are not "when-issued" bonds. 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.

	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 Period - Fiscal	-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 Limited or Retired	-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 Control	YES	YES	YES	YES	YES	YES
State Institution Control	YES	YES	YES	YES	YES	YES
State Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	YES	YES
Month Fixed Effect	YES	YES	YES	YES	YES	YES
Observations	3,831	3,831	3,801	3,801	3,726	3,726
R-squared	0.976	0.889	0.976	0.842	0.866	0.863

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

This table provides results using alternative measures of the election period. The estimated coefficients are from weighted least square regressions, with the weight the number of bonds issued by states. All regressions include a constant, state fixed effect, yearly dummies, monthly dummies, and dummies of capital purpose. T-statistics, reported in parentheses, are based on standard errors clustered by states.

	(1)	(2)	(3)	(4)
Election Period – Fiscal	0.072***			
	(4.99)			
Election Period – 6 month		0.057***		0.054***
		(3.96)		(3.95)
Election Period – Calendar			0.026*	
			(1.72)	
Post-Election Period – 6 month				-0.026**
				(-2.59)
Constant	Included	Included	Included	Included
Bond Attributes Control	YES	YES	YES	YES
Macroeconomics Control	YES	YES	YES	YES
State Institution 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	114,409	114,409	114,409	114,409
R-squared	0.8	0.8	0.8	0.8

Appendix A: Variable Definitions and Data Source

This table reports the definitions and construction method of the variables, along with the data source. MBSD-Tranche represents tranche-level variables from the *Bondinfo* table in MBSD. MBSD-Issue represents issue-level variables from the *Issuinfo* table in MBSD. MBSD-Agent represents variables from the Agent table in MBSD. NASBO indicates the National Association of State Budget Officers. 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 CPI.

Variable	Definition	Data Source
Bond-level Variables		
Offering Yield	Yield to maturity at the time of issuance. Tranche dollar value weighted average of offering, if offering yield is available.	MBSD-Tranche
Time to Maturity	Time to maturity in month. Tranche dollar value weighted average, if the time to maturity is available.	MBSD-Tranche
Benchmark T-bond Yield	Yield of the Treasury maturity-matched bond.	MBSD-Tranche
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
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-Tranche
G.O. Bonds	A flag indicating that the bond is unlimited general obligation funds when 1; it is 0 otherwise.	MBSD-Tranche
Revenue Bonds	Flag indicating that the bond is a revenue bond when 1; it is 0 otherwise.	MBSD-Tranche
Callable	Tranche dollar value weighted average call ability, 1 denotes a callable bond, 0 denotes a non-callable bond.	MBSD-Tranche
Additional Credit Enhancement	Flag denoting whether the bond has additional credit associated with it. Tranche dollar value weighted average.	MBSD-Tranche

Bond Insurance	Bond issuance code of the issue, identified by the maximum tranche bond.	MBSD-Tranche
Offering Date	The sales date the issue was originally offered.	MBSD-Issue
Offering Amount	The total par value (or discount value) of debt initially issued as per the offering statement.	MBSD-Issue
Negotiated Offering	Flag indicating if bond is offered by a negotiated method, with 1 denoting yes, and 0 indicating otherwise.	MBSD-Issue
Competitive Offering	Flag indicating if bond is offered by a competitive method, with 1 denoting yes, and 0 indicating otherwise.	MBSD-Issue
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-Bond; 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-Bond; SDC
High Yield	Flag indicating that bond is a high yield bond with bond rating below BBB-.	Constructed
State-level Municipal Bond Index Yield	The yield of state municipal bond index from 1996 to 2010.	Bloomberg
Total Trades of Municipal Bonds	The total number of trades of municipal bonds in secondary markets for each state per month.	MSRB
Net Buy Trades of Municipal Bonds	The number of buy trades minus the number of sell trades of municipal bonds in secondary markets for each state per month.	MSRB
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
Democrat	Flag indicating the affiliated party of the incumbent governor, with 1 denoting Democrat; it is 0 otherwise.	Wikipedia

Term Limits or Retired	Incumbent governor cannot stand for re-election due to either term limits or retirement.	Wikipedia
Party Changed	Flag indicating if the party of the election's winner is different from the party of the incumbent, with 1 denoting party change; it is 0 otherwise	Wikipedia
State Institutions		
Balanced Budget	Index measuring balanced budget restrictions. The sum of the following 3 indicators: 1) Governor must submit balanced budget; 2) Legislature must pass balanced budget; 3) Governor must sign balanced budget. Range from 0 to 3.	NASBO
Governor Authority	The degree of the governor's authority over the budget process. The sum of the following 4 indicators: 1) Reorganize department without legislative approval; 2) Spend unanticipated (federal) funds without legislative approval; 3) Reduce enacted budget without legislative approval; 4) No restriction on the governor's budget reductions without legislative approval.	NASBO
Governor Veto	The degree of the governor's veto power. The sum of the following 4 variables: 1) Line item veto; 2) Item veto of appropriations; 3) Item veto of selected words; 4) In term veto to change meanings of words.	NASBO
GAAP	Flag indicating if the state adopted generally accepted accounting principles.	NASBO
Debt Limit	Flag indicating if there is restriction on general obligation (authorized) debt.	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
Party 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
State Macroeconomic Variables		
Activity Index	Monthly state coincident economic activity index.	FRED
Economic Leading Index	Monthly state leading economic activity index.	FRED
Housing Index	Quarterly state housing index.	FRED
Unemployment Rate	Monthly unemployment rate of the state.	BLS
Income Growth Rate	Quarterly growth rate of state personnel income.	BEA

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
Deficit	The difference between total expenditure and total revenue in 1997 dollars.	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
Interest on Debt	State interest expense on debt in 1997 dollars.	SGF
Other Variables		
Education – High School	Percentage of the population over 25 with high school diplomas.	Census 2000
Education – College	Percentage of the population over 25 with college degree.	Census 2000
Media Coverage	Daily newspaper circulation per capita.	Census 2000
PIN	Corruption index from Public Integrity Section.	Department of Justice
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