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

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Abstract

This research investigates how political uncertainty around U.S. gubernatorial elections influences the borrowing costs of public debt, measured by yields of municipal bonds. Our evidence, from both the new issuance market and the secondary market, shows that yields of municipal bonds increase sharply by 6 to 8 basis points before elections and then reverse afterward. Elections have more pronounced impact during economic downturns, when outcomes are less predictable, and when states have more outstanding debt. Several state institutions, such as GAAP-budgeting, spending limits and tax-increase limits, help to mitigate the adverse impact of political uncertainty.

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

JEL Codes: G12, G18, G28

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1 Introduction

At the end of the 2010 fiscal year, the U.S. federal, state, and local public debt outstanding amounted to $15.41 trillion, $1.10 trillion, and $1.75 trillion, respectively (according to the U.S. Census Bureau and the U.S. Department of the Treasury). Given the sheer size of public debt, financing costs are fundamentally important. And what determines public financing costs? Under the standard fixed-income framework, the cost of debt financing is determined by an issuing entity's financial strength, as well as liquidity and liquidity risk of an issue. For a subset of tax-exempted bonds, tax and tax risk directly affect yield. A distinctive characteristic of public debt is, however, its underlying issuer. While valuation of private debt reflects managerial decisions, it is politics that impacts financing cost of public debt.

Inherent in politics is political uncertainty, and political uncertainty impacts the real economy. Boutchkova, Doshi, Durnev, and Molchanov (2012), Durnev (2010), and Julio and Yook (2012a and 2012b) show that political uncertainty affects investment dynamics, induces international equity market volatilities, and drives cross-border capital flows. Pástor and Veronesi (2012 and 2013) provide a framework that relates political uncertainty to equilibrium asset prices. We use U.S. gubernatorial elections and municipal bond markets as our empirical setting to study the impact of political uncertainty – uncertainty about outcomes of gubernatorial elections, and about elected officials' preference for economic policies, and their likely policy actions – on public financing costs, measured by yields of municipal bonds in the primary and secondary markets.

Despite its theoretical foundation and ample anecdotal evidence, relating political uncertainty directly to public debt financing costs is challenging. First, it is difficult to identify, on an *ex ante* basis, what constitutes political uncertainty. It is not directly observable, and it affects financial markets mainly through investors' perceptions. Second, observed political events, political news, political outcomes, or political actions, labeled as political uncertainty *ex post*, are usually intricately associated with changes in economic fundamentals, which may collectively affect public debt financing costs. For example, many intuitive measures of political uncertainty, such as changes of controlling political party, are shown to be related to economic conditions (Kramer, 1971; Hibbs, 1977). Finally, marginal costs of government financing are not easily observable. Currently available state-level fiscal and financial statistics tabulate interest cost for outstanding debt on the

balance sheet, rather than the marginal cost of newly issued debt. We overcome these challenges by exploiting cross-state variation in the timing of gubernatorial elections to identify political uncertainty, aided by relatively homogeneous legal, political, and economic systems across the states. Using municipal bonds as testing assets, we can measure the marginal financing costs of public debts.

U.S. gubernatorial elections provide an ideal laboratory to study political uncertainty for a number of reasons. First, elections of governors have consequences for a state's economy. The United States Constitution grants state governments significant power to enact and alter statutes and policies that directly affect a state's economy. Through the democratic transition process, politicians with potentially different policy preferences are elected. Thus gubernatorial elections introduce political uncertainties about all sorts of policies, many directly or indirectly affecting public debt financing costs.[1] Second, the timing of gubernatorial elections is predetermined and not affected by general economic conditions. Therefore, the empirical framework at least partially disentangles endogeneity associated with political uncertainty and the state of the economy. Third, the vast majority of states in the U.S. hold elections for governor on a rotating basis every four years. Such an arrangement creates natural treatment and control samples whenever an election takes place. Hence, our empirical identification strategy exploits both cross-state variation due to elections in a given year, and within-state variation due to elections over time in a difference-in-difference framework. Finally, focusing on gubernatorial elections within one country gives us a relatively homogeneous group of treatment and control samples because there are common levels of economic development, monetary policy, and capital market functions across states.

We focus on municipal bonds, the primary source of state and local public debt. While a state's gubernatorial election impacts that particular state's economy, its impact on other state's economies is more muted. In theory, the risk associated with political uncertainty induced by one state's gubernatorial election may be diversified away at a national level. Yet a unique feature of the U.S. municipal bond market is its market fragmentation (Schultz, 2012). Since interest earned is tax-exempted, municipal bonds issued by one state are usually held by residents of that

[1] In an influential paper, Peltzman (1987) compares a state's governor to "an executive in a small open economy without a central bank." He further states that "in the organizational chart of American federal system, governors and presidents share similar power of appointment, budget making, etc." Ang and Longstaff (2012) point out that "the relation between U.S. states closely parallels that of the sovereigns in the Eurozone."

state. Because of such fragmentation, the risk due to political uncertainty induced by one state's gubernatorial election is likely non-diversifiable for the bondholders from that state.

In our empirical tests, we first examine the impact of elections on offering yields of municipal bonds. We find that the yields of municipal bonds issued in the period prior to an election sharply increased by about 6 to 8 basis points (significant at the 1% level) over yields of bonds issued in a non-election period. The effect is economically large. To put this into perspective, it is informative to compare it with the yield differences due to other commonly discussed bond features. For instance, the average yield difference between investment-grade and high-yield municipal bonds is 6 basis points, and the yield difference between general obligation bonds and non-general obligation bonds is about 12 basis points.

Our empirical evidence is consistent with the mechanism through which political uncertainty affects risk premiums (Pástor and Veronesi, 2013). In the economy characterized by Pástor and Veronesi (2013), the risk premium is driven by both economic shocks and non-economic shocks (i.e., political uncertainty). In their model, at any time there is an "old" policy with unknown impact on the economy. Through Bayesian learning, agents learn an old policy's impact. More importantly, the government can endogenously choose a "new" policy from a menu of potential policies to replace the old policy, thus generating political uncertainty. Before enactment of the new policy, agents learn which policy is likely to be adopted. After the new policy is chosen and announced, agents again learn about its impact. Independent of traditional risk factors, political uncertainty directly affects the risk premium.

An important insight from Pástor and Veronesi (2013) is that composition of the risk premium is state-dependent. During economic contractions, political uncertainty constitutes a large fraction of the risk premium, precisely because policy change is more likely. We ask, for municipal bonds, how political uncertainty, interacting with local economic conditions, affects public debt financing costs. To answer the question, we explore a source of within-state variation by differentiating elections coincident with local economy expansions and elections coincident with local economy contractions. Consistent with the theoretical model's predictions, we find that political uncertainty has a particularly large effect on public financing costs during downturns in an economy. For example, for municipal bonds issued during elections coincident with economic contractions, the offering yield is about 7 to 18 basis points higher than that for bonds issued during elections

coincident with economic expansions.

Our identification assumption behind the primary empirical tests is that political uncertainty is on average higher during the period leading up to an election than in other periods. While this seems to be a reasonable assumption, in order to cross-validate the assumption and deepen our understanding of political uncertainty, we further explore variation in the degree of political uncertainty induced by elections and their likely economic impact across states and over time.

The first source of variation is the predictability of outcomes of an election. Using a novel dataset on polls of voters prior to elections, we record the fraction of undecided votes, which captures *ex ante* uncertainty associated with an election's outcomes. We also distinguish elections in which incumbents are eligible for re-election and elections in which incumbents face term limits. Ansolabehere and Snyder (2002) noted that incumbency advantage is an important predictor of any election's outcomes. An election in which the incumbent faces term-limit and is ineligible for re-election introduces more uncertainty than an election with incumbent running for re-election. Our results unequivocally suggest that elections with less predictable outcomes have a greater impact on public financing costs.

The second source of variation comes from the status of state government finance. In particular, we focus on state government debt outstanding to state gross domestic product ratios (debt/GDP) and state government's deficit. When the debt/GDP ratio is higher within a state, or the state government runs a deficit, potential changes of fiscal policies are more likely. Therefore, the marginal impact of political uncertainty induced by an election on offering yields is expected to be stronger. Our estimate indeed shows that when an election coincides with higher leverage (i.e., a debt/GDP ratio above its historical median debt/GDP ratio within a state), an election has a stronger impact, compared to an election that coincides with low leverage.

The third source of variation comes from state institutions. We investigate how elements of state institutions, such as statutory restrictions on budget processes can mitigate or exacerbate the adverse impact of political uncertainties on public debt financing costs. In the U.S., there are significant variations in fiscal and budgetary institutions across states and over time. We explore the interactions between political uncertainty and institutions and examine how such interactions affect government public debt borrowing costs. Considerable evidence suggests that the adoption of generally accepted accounting principles (GAAP) in government budgeting process, the implemen-

tation of limits on spending-increase and tax-increase, and balanced-budget restrictions ameliorate the impact of political uncertainty on government public debt financing costs during election periods. For instance, the adoption of GAAP-based budgeting reduces financing costs by 3.5 basis points; stipulation of balanced-budget restriction reduces financing cost by 4.4 basis points; enactment of spending-increase limit reduces financing costs by 4.2 basis points; and the implementation of tax-increase limit reduces financing costs by 2.8 basis points during election periods.

While U.S. gubernatorial elections provide a nice empirical setting to study the impact of political uncertainty on public financing costs, the design has its limitations. One empirical challenge is the potential endogeneity associated with the timing of bond issuance and election. For example, to reduce exposure to political uncertainty, an issuer may postpone the issuance of bonds until after an election. Another is that politicians may have incentives to promote low-quality "sweetheart" deals during an election period.

To see whether the endogenous timing of issuance is driving our results, we examine seasoned bonds already trading in the secondary market. As seasoned bonds are issued outside an election window, they are not subject to the issuer's timing decisions. Using a set of state-level secondary market bond index yields, we obtain remarkably similar evidence; the yield of the state-level bond index sharply increases prior to elections and then drops after elections. Therefore, we conclude that our results cannot be attributed simply to the endogenous timing of bond issuance.

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

To lend additional support for investor aversion to political uncertainty, we consider their trading

behavior. Uncertainty-averse investors are less willing to purchase municipal bonds prior to an election and thus demand higher offering yields. We use detailed secondary market municipal bond transaction data from the Municipal Security Rulemaking Board (MSRB) to 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, drops by 25.6% (t-statistic = 2.53) prior to elections. Overall, our evidence suggests that investor aversion to political uncertainty and the consequent demand for risk premium compensation are the driving forces behind the higher offering yield during election periods.

We contribute to several themes in the literature. First, our study complements vast literature on fixed-income.[2] We show that politics, and political uncertainty in particular, is an important ingredient in the valuation of public debt. Second, we add to the literature on the real effect of political economy, and political uncertainty in particular, on financial markets.[3] Third, there is a large body of literature examining the interaction between institutions and the real economy.[4] We identify a set of state fiscal and budgetary institutions that mitigate the adverse impact of political uncertainty on public debt financing costs. Our findings have two implications for studies of institutions. First, by showing that political institutions mitigate or exacerbate political uncertainty, we identify 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 that 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

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

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

[4] The literature is too large to summarize here, but authors examine how political elections impact economic policy choices (Besley and Case, 1995); how a 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 bond secondary market quoted yields (Poterba and Rueben, 1999); how corruption impacts municipal borrowing costs (Butler, Fauver, and Mortal, 2010); and how fiscal imbalance impacts the borrowing cost of municipal bonds (Capeci, 1994; Novy-Marx and Rauh, 2012).

costs.

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 examines political uncertainty under different economic conditions, and its impact on offering yield. Section 5 explores variations in the degree of political uncertainty induced by elections, and studies how these variations affect the impact of elections on borrowing costs of municipal bonds. Section 6 identifies the mechanisms through which political uncertainty affects offering yield, and discusses several alternative explanations. Section 7 presents robustness and additional tests. Section 8 concludes.

2 Data and Summary Statistics

We collect a large amount of data from various sources. The sample of newly issued municipal bonds comes from the Municipal Bond Securities Database (MBSD). We collect yields and trades of seasoned municipal bonds from Bloomberg and the Municipal Securities Rulemaking Board (MSRB). The gubernatorial election data are collected mainly from Wikipedia. We hand-collect information on state fiscal and political institutions from government publications. In this section, we describe our sample selection and data collection procedure. Appendix A provides details on definitions, construction, and data sources of variables.

2.1 Municipal bond data

We first study newly issued municipal bonds by extracting a sample of municipal bonds issued between 1990 to 2010 from Mergent's Municipal Bond Securities Database (MBSD). The basic unit of an observation in MBSD is an *tranche*. Different tranches have different CUSIP numbers. Usually, multiple tranches with different maturity dates, coupon rates, offering yields are grouped into one *issue*. Tranches of an issue share the same underlying issuer, underwriting syndicate, and offering date. Similar to the common practice in studies of syndicated loans, we construct issue-level attributes by aggregating trache-level characteristics.[5]

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

MBSD provides only the most recent bond ratings as of December 2010 (the vintage of our database), rather than ratings at the time of issuance. With the MBSD sample, we identify a rating as an original rating if the rating date is prior to or coincides with the offering date. We further augment MBSD data with rating information from the Global Public Finance Database from the Security Data Corporation (SDC). We match the MBSD with the SDC using the issuer's CUSIP, bond offering date, bond offering amount, and the states of issuers. To increase the sample size, we combine three major rating agencies' ratings in the following order: Moody's, S&P, and Fitch. If rating information is still not available, the bond is coded as "not rated."[6] We include only tax-exempt municipal bonds and exclude bonds subject to state and/or federal tax. We also exclude Build American Bonds (BAB), anticipation notes, certificates, and other types of non-standard bonds. The final sample includes 121,503 issues.

We do not separately analyze state and local debt for several reasons. First, state government policies affect local government fiscal conditions. Second, despite local government autonomy, in some cases state governments provide implicit guarantee to local government debt. For example, in a recent release of credit rating criteria, Standard & 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). Third, state government often directly imposes restrictions on local debt (Epple and Spatt, 1986).[7]

Second, we study seasoned bonds traded in secondary markets. Bloomberg provides yields of state-level municipal bond indices (i.e., Fair Value Municipal Bond Index) of different maturities, ranging from 3-month to 30-year. For an index to be included in our sample, we require it to have consecutive monthly time series in our sample period. This procedure gives us indices from 19 states with maturities of 1-, 5-, 10-, and 30-years over the sample period from 1996 through 2010.[8]

We also examine transactions of municipal bonds in secondary markets. From the Municipal

[6] When we contacted all three major rating agencies to obtain historical ratings, we were informed that none of the rating agencies maintains a complete record of historical ratings before 2009.

[7] Epple and Spatt (1986) summarize the historical development on this topic and provide a large number of references. A key feature of their model is that a local government's default can impose a negative externalities upon other localities within a state.

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

Security Rulemaking Board (MSRB), we obtain trade by trade municipal bond transaction data from January 1999 through June 2010. The dataset provides a detailed breakdown of the type of transactions – customer transactions versus interdealer transactions – and records the direction of transactions – buy versus sell trades. For each state, we estimate the monthly total number of transactions as well as the number of net buys.

2.2 Election data

We hand-collect data on U.S. gubernatorial elections from various sources. The primary source for election data is Wikipedia. We check for data quality by cross-referencing Wikipedia information with other sources, including state election commission web sites, CNN, and Factiva newspaper archives. 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. The exceptions are New Hampshire and Vermont, which elect governors every two years.[9]

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.[10] We define a bond as election-affected if the bond was 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 when outcomes of primary elections are known. With few exceptions, most states end their fiscal year at the end of June.[11] Almost all elections take place at the beginning of November during the election year, with the sole exception of Louisiana in 1999.[12]

So election periods overall are mainly the period between July and October during an election year, but we also experiment with different definitions of the election period. For example, we define the election period as six months before the election, or all months before the election date

[9] 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.

[10] From 1990 to 2010, there were 299 elections. Upon merge with our bond sample, we identify 298 relevant elections. South Dakota didn't issue bonds in 1990 but there was an election.

[11] The fiscal year of New York ends in March, that of Texas ends in August, and those of Alabama and Michigan end in September.

[12] During our sample period between 1990 and 2010, Louisiana conducted a "jungle primary" on October 23, 1999, and did not need to hold a "runoff election." A non-partisan 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 elective 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.

in the same calendar year (typically from January to October in the election year). Our results are robust to these alternative definitions.

From Polling the Nations (PTN) database, we hand-collect polling data on the U.S. gubernatorial elections from 1990 to 2010. For each election, we use the last available poll before the general election to estimate the percentage of "undecided votes." A poll typically provides a list of candidates for the election, and asks likely voters which candidate they are likely to vote for. We call "not sure," or "don't know," or "undecided" responses undecided votes. We expect an election to be more uncertain when there is a high percentage of undecided votes. We found $1,643$ polls with relevant information for 150 elections in 47 states. The percentage of undecided votes ranges from 0 to 34.00% with a mean of 7.62%.

2.3 State institutions

We manually collect state fiscal and budgetary institutions information from scanned copies of "Budget Processes in the States," available from the National Association of State Budget Officers (NASBO) and published 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 a value of one when a state adopts Generally Accepted Accounting Principles (GAAP) in the budgeting process, and zero otherwise. The 2008 issue of "Budget Processes in the States" also summarizes when a state legislature has enacted spending and revenue limits. To determine when states adopt spending limits, revenue limits, and tax-raise limits, we cross-reference two additional sources: (1) "State Tax and Expenditure Limit (2008)" from the National Conference of State Legislatures (NCSL), and (2) features of fiscal institutions from Poterba and Rueben (1999). From Poterba and Rueben (1999), we obtain the state balanced budget stringency index. Its values range from 0 to 10, with a higher value indicates more stringent balanced-budget requirement.

2.4 State macroeconomic variables

We take into account a number of state-level macroeconomic variables. State-level annual GDP data are obtained from the U.S. Bureau of Economic Analysis (BEA). Using the annual survey of State Government Finance provided by the U.S. Census, we collect the state finance variables such

as outstanding debt and capital outlay. Monthly unemployment rates are from the U.S. Bureau of Labor Statistics (BLS). The monthly leading index of economic activity is obtained from the Federal Reserve Bank of Philadelphia. When appropriate, we adjust all dollar value denominated variables to the 1997 dollar value using the Consumer Price Index (CPI) from the Federal Reserve Economic Data (FRED).

Since our sample includes tax-exempt municipal bonds, in all of the analysis we include a maturity-matched benchmark Treasury yield and the marginal tax rate. The benchmark Treasury yield is obtained from the Center for Research in Security Prices (CRSP) Treasury files. The marginal tax rate is calculated as the sum of the highest marginal federal income tax rate and the state income tax rate, obtained from National Bureau of Economic Research's TAXSIM.[13]

To control for state credit quality, we include state-level credit ratings, obtained from two sources. First, in our municipal bond sample, for each state and quarter, we take the highest bond ratings of uninsured general obligation bonds without special bond features as the state rating, which we term *implied state ratings*. Second, we collect the annually updated state ratings from the "Statistics Abstract of the United States: State and Local Government Finance and Employment" provided by the U.S. Census Bureau, available only between 1995 and 2009. Since these two sets of ratings are highly correlated when they overlap, we use the quarterly implied state ratings in our regression analysis. Results are robust to using the alternative. We match each bond with one-month (one-quarter, one-year) lagged macroeconomic variables, depending on data frequency and availability.

2.5 Descriptive statistics

Table 1 provides descriptive statistics of the municipal bonds in our sample. Panel A summarizes bond issuance activities by state. In our sample period between 1990 and 2010, Texas has the largest number of bond issuance (11,816 issues, 9.72% of the total number of issues), followed by California (9,616 issues, 7.91% of the total) and New York (8,659 issues, 7.13% of the total). By total dollar amount of issuance, California has the largest amount ($484,341 million), followed by New York ($447,106 million), Texas ($299,466 million), Florida ($186,573 million), and Pennsylvania

[13] The exact tax treatment of municipal bonds is somewhat complicated. Kueng (2012) and Schultz (2013) provide some excellent summaries.

($165,305 million). The dollar amount of bond issuance by these five states ($1.58 trillion) accounts for 47.36% of the total dollar amount of issues by all states ($3.34 trillion). At the other end of the scale, Wyoming, Montana, South Dakota, North Dakota, and Vermont together account for only 0.61% of the total dollar amount. In terms of average offering size per issue, Hawaii has the largest ($98.91 million), followed by New York ($51.63 million), and California ($50.37 million).

The state with the highest average offering yield (equally-weighted) is Wisconsin (5.28%), followed by Florida (5.04%) and California (4.88%). 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 and North Dakota (each 118 months).

Panel A also provides some basic state economic statistics for the period between 1990 and 2010. The state with the 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 Debt/GDP ratio near zero. The four states with the highest unemployment rates are Alaska (6.98%), California (6.86%), and Michigan and Oregon (both 6.66%). North Dakota, South Dakota, Nebraska, Iowa, and Virginia have average unemployment rates below 4.00%.

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

Panel A of Table 2 reports summary statistics for the variables included in our regressions. In our sample, 8% of bonds were issued during the period after the fiscal year ends and before the election ("Election Period – Fiscal"); 15% of bonds were issued in the six months before the election ("Election Period – 6 months"), and 25% were issued in the pre-election period but in the same calendar year as the election ("Election Period – Calendar"). Overall, 39% of the bonds were

issued during the tenure of an incumbent governor facing term limits. The average yield of the maturity-matched Treasury is 4.75%, and the mean of term spread is 1.73%.

In our sample, average yield to maturity is 4.42%, and the time to maturity ranges from 1 month to 1,202 months with an average of 156 months. 47% of the bonds were general obligation bonds, and 18% were issued using competitive offering method. 46% of the bonds were insured, 12% had additional credit enhancement, and 16% involved pre-funded arrangements. 56% of the bonds were callable bonds, 39% were rollover bonds issued to refund previous bonds, and 52% were non-investment grade including not-rated bonds.[14] Overall, our sample composition is very similar to that of previous studies (Novy-Marx and Rauh 2012).

Panel A of Table 2 also reports some summary statistics on state macroeconomics. For example, the average annual GDP growth rate is 3% and average unemployment rate is 5.55%. At the end of Panel A, we report the statistics on fiscal and political institutions. In our sample, 49% of bonds were issued by states following GAAP-based budgeting, and 16%, 44%, and 31% of bonds were issued when revenue, spending, and tax increase limits were in place.

Panel B of Table 2 presents 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. Competitive offering is negatively related to the offering yield with a correlation coefficient of -0.31. Callable bond is positively related to the offering yield, with a correlation coefficient of 0.48. Non-investment grade bond is positively related to yield, with a correlation coefficient of 0.11. These correlation coefficients are statistically significant at the 1% level.

3 Elections and Municipal Bond Offering Yields

We conjecture that political elections induce uncertainty about economic policies, which in turn affects a state's borrowing costs. Thus, investors require a higher risk premium for municipal bonds issued by a government facing an upcoming election. The hypothesis is that, for the same state, municipal bonds issued during elections demand higher yields than bonds issued during non-election

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

periods.

3.1 Univariate evidence

Panel A of Figure 2 shows that the time-series evolution of municipal bond offering yield spreads exhibits an inverse V-shape, with the peak occurring during the month immediately prior to the election. Specifically, the offering yield spread increases monotonically by about 34 basis points [= $(-0.08\%) - (-0.42\%)$], starting six months before the election and ending one 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 to its pre-election level.

Panel B of Figure 2 shows seasonal adjusted offering yield spreads. We remove potential seasonal effects in yield spreads by regressing the offering yield spreads over 12 monthly dummies. This graph shows the same pattern as in Panel A with an increase of yield spreads before the election and a drop after the election. In Panels C and D, we provide the time-series evolution of offering yield spread over calendar months during years with elections (Panel C) and without an election (Panel D). During an election year (Panel C), since elections usually take place at the beginning of November, we observe an increase in offering yield spreads before the election (from April to October) and then a drop after the election. Panel D, when there is no election, reveals no such pattern. The preliminary evidence thus suggests that offering yields of municipal bonds are higher during the election period.

Table 3 compares several characteristics of bonds issued during election periods (column 1) and bonds issued during non-election periods (column 2); column 3 reports the difference. Bonds issued during election periods have considerably higher offering yields than those issued during non-election periods. The difference is about 12 basis points (t-statistic = -9.85).

Bonds issued during election periods are slightly larger by about \$2 million per issue, and they have slightly longer maturities (by three months).[15] Municipal bonds issued during election periods have higher ratings. In addition, bonds issued during election periods are slightly more likely to be general obligation bonds, and bonds with insurance features, but less likely to be associated with

[15] As Appendix C illustrates, average monthly issuance amount during election periods is *not larger* than during non-election periods after controlling for state macroeconomic conditions and state fixed-effects.

additional credit enhancement.[16]

3.2 Regression models and empirical results

We use a standard difference-in-difference framework to study the impact of elections on bond yields while controlling for other determinants. The main regression model is specified as follows,

$$y_{ijtk} = \alpha_j + \gamma_t + m_k + \beta \times Election_{jtk} + \sum \boldsymbol{\varphi}_i \mathbf{X}_i + \sum \boldsymbol{\delta}_j \mathbf{S}_{jtk} + \varepsilon_{ijtk} \tag{1}$$

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

The set of controls are motivated by Collin-Dufresne, Goldstein, and Martin (2001). $\mathbf{S}_{jtk}$ is a vector of state-specific characteristics and macroeconomic variables, including state population growth rate, natural logarithm of state gross domestic product (GDP), annual state GDP growth rate, state unemployment rate, state leading index, state government GDP to total GDP ratio, government debt to GDP ratio, state rating, benchmark Treasury yield, income tax rate (the sum of the highest federal and state marginal income tax rates), and term spreads.[17] $\mathbf{X}_i$ is a vector of bond-specific characteristics, which include offering amount, maturity, offering method, callability, ratings, and credit enhancement, among others. All regression models include state fixed-effects (α_j), year fixed-effects (γ_t), and month fixed-effects (m_k).

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

[16] 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 zero otherwise. Credit enhancements include but are not limited to collateral purchase programs, guaranteed investment contracts, loan purchase agreements, and credit enhancement/intercept programs.

[17] The leading index for each state includes the coincident index, as well as state-level housing permits, state initial unemployment insurance claims, the Institute for Supply Management (ISM) manufacturing survey of delivery times, and the interest rate spread between the ten-year Treasury bond and the three-month Treasury bill. The coincident index,whose long-term trend matches state long-term GDP growth rate, includes non-farm payroll employment, average hours worked in manufacturing, the unemployment rate, and wage and salary disbursements deflated by the consumer price index (U.S. city average).

[18] We have experimented with calculating standard errors based on two-way clustering by year and state. Standard

One econometric issue is worth noting. Across states, there is a wide variation in the number of bonds issued. For example, Texas issued 11,816 municipal bonds with a total dollar value of \$299,466 million, compared to Delaware with only 157 bonds and a total dollar value of \$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 the impact of political uncertainty on the financing costs of the issuers.

To better reflect issuance activities by state and better measure economic magnitude, we implement weighted least squares (WLS) regressions. In WLS regressions, we use the probability of each state entering our sample as the weight. In other words, issuance activity by state is the weight in these regressions. We also consider the feasible generalized least squares regression (FGLS) and ordinary least squares (OLS) regression as additional robustness checks. Consistent with earlier univariate evidence, results are robust to these alternatives.

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

Column (1) reports the results from the baseline model, which includes the maturity-matched 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-statistic = 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 1 basis point increase in the benchmark Treasury yield translates into a 0.951 basis point increase in the municipal bond yield.

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

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.

office pay yields that are 3.3 basis points higher.

In columns (2) to (3), we sequentially include additional variables describing bond characteristics and state macroeconomic conditions. These additional variables change the estimate of an election's impact on municipal bond offering yields only marginally; the point estimates range from 6.7 basis points (column 2) to 7.0 basis points (column 3), both economically sizeable. To provide a scale for these results, one can relate yield to some commonly observed bond characteristics. For example, the average yield difference between investment-grade and high-yield municipal bonds is 6 basis points, and the average yield difference between a general obligation bond and a non-general obligation bond is about 12 basis points.[19]

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. Other coefficient estimates are statistically significant and of the expected sign. For example, bonds with longer maturities have higher yields, and larger issues have lower yields. General obligation bonds have lower yields, while callable bonds have higher yields. Insured bonds, bonds with additional credit enhancement features, investment-grade bonds, and bonds 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 consistently significant in determining offering yields. The state-level leading economic index is significantly negatively related to offering yields. A state with a better economic outlook can borrow at a lower cost. A one standard deviation increase in the leading economic index (1.44) reduces the offering yield by 11 basis points. A state with a larger fraction of government debt outstanding to state gross domestic product (Debt/GDP ratio) pays higher borrowing cost. A one standard deviation increase (about 0.025) in the government debt to total GDP ratio demands a 10 basis point higher offering yield. Higher state ratings reduce the offering yields. A one-notch increase in a state's rating reduces the offering yield by 4.41 basis points.[20]

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

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

In an untabulated 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-effects.

In column (4), we repeat the specifications from column (3), but include only a subsample of general obligation bonds. Because GO bonds are backed by a state or local government's pledge to use all legally available resources, including tax revenues, to repay bond holders, the market perceives GO bonds as having little default risk. The point estimate of election on offering yield is 6.8 basis points (t-statistic = 3.98).

In column (5), we 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), holders of insured 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 very low *de facto* default risk. The point estimate of election on offering yield is 6.6 basis points (t-statistic = 6.51), which is again similar to those obtained from previous specifications.[21]

Taking the evidence in columns (4) and (5) together, to the extent that there is low default risk among general obligation bonds, or that risk is muted by bond insurance, the increase in municipal bond offering yields is not likely to be driven by a sudden surge in default risk during the election period.

In column (6), we focus on a subsample of rollover bonds. Rollover bonds are issued to refund previous bond issues, originally issued with higher borrowing costs or that would have matured. Hence, the timing of their issuance is more likely to be determined by cost saving motives and the macroeconomic environment. The estimated coefficient is 0.084 (t-statistic = 6.17), which is comparable to the estimates for the full sample of municipal bonds considered in the previous regressions.

4 Economic Conditions and the Impact of Elections

We have seen that political uncertainty induced by forthcoming elections increases the offering yields of municipal bonds. Does the impact political uncertainty induced by an election vary

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

with economic conditions? Pástor and Veronesi (2013) demonstrate that political uncertainty has a greater impact on asset prices when the economy is in a downturn. One mechanism in their model through which political uncertainty operates is uncertain policy changes. Uncertain policy changes are more likely to occur during economic downturns, and investors may demand higher risk premiums as compensation.

We hypothesize that there is a more pronounced impact of political uncertainty (induced by upcoming gubernatorial election) on public debt financing costs when a state's economy is in a downturn. To test this hypothesis, we focus on the interaction between an election and a state's economic conditions. Because control variables may impact offering yields differentially during local economic expansions and contractions, we estimate a full-interaction model. That is, we interact economic condition with all independent variables. We are interested in examining whether economic contractions amplify the impact of political uncertainty on borrowing costs.

The empirical model is specified as follows:

$$\begin{aligned} y_{ijtk} &= \alpha_j + \alpha_j' \times I_{jtk} + \gamma_t + \gamma_t' \times I_{jtk} + m_k + m_k' \times I_{jtk} + \beta_0 \times Election_{jtk} + \beta_1 \times Election_{jtk} \times I_{jtk} \\ &\quad + \beta_2 \times I_{jtk} + \sum \boldsymbol{\varphi}_i \mathbf{X}_i + \sum \boldsymbol{\varphi}_i' \mathbf{X}_i \times I_{jtk} + \sum \boldsymbol{\delta}_j \mathbf{S}_{jtk} + \sum \boldsymbol{\delta}_j' \mathbf{S}_{jtk} \times I_{jtk} + \varepsilon_{ijtk} \end{aligned} \tag{2}$$

where I_{jtk} is an indicator variable that takes a value of one if a state's local economy is in contraction, and zero otherwise. We are particularly interested in the coefficient β_1. A positive and significant β_1 suggests a greater of $Election_{jtk}$ during contraction than during expansion. To facilitate comparison, we also examine the election's impact on offering yields in expansions and contractions separately.

We consider several alternatives to identify economic expansions and contractions. First, we directly use the U.S. business cycle dating information from the National Bureau of Economic Research (NBER). We create an indicator variable that equals one if the U.S. economy is in recession, and zero otherwise. Second, we consider the state-level unemployment rate to differentiate economic expansions and contractions. We define an expansion (and contraction) as the period when the corresponding election period average state-level unemployment rate is below (above) the state's historical median unemployment. Finally, we consider the state-level economic leading indices. Here, we define an expansion (contraction) as when the corresponding election period aver-

age 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 indicator of state economic condition, we separately estimate the impact of an election during economic expansions and contractions, and report the estimated coefficients of key variables. For instance, when we use NBER business cycles to classify economic conditions, we find that the impact of election on offering yields is 24.6 basis points (t-statistic = 3.86) during contractions, and 6.3 basis points (t-statistic = 4.61) during expansions. Classifying economic conditions based on state-level unemployment rates, the impact of *Election* × *Economic Indicator* on offering yields is 9.7 basis points (t-statistic = 4.61) during contractions, and 2.5 basis points (t-statistic = 2.28) during expansions. Finally, when we classify economic conditions based on state-level economic leading indices, we find that the impact of election on offering yields is 12.8 basis points (t-statistic = 4.21) during contractions, and 1.9 basis points (t-statistic = 0.74) during expansions. Overall, the results confirm that elections have a greater impact on offering yields during economic contractions.[22]

To test the statistical significance of the differential impact of elections on offering yield, we estimate a full-interaction model specified in equation (2). The main variable of interest is *Election* × *Economic Indicator*. In all specifications, the interaction terms are both statistically and economically significant. The difference between the impact of elections on offering yields during contractions and expansions ranges from 7.3 basis points (column (6), based on state-level unemployment) to 18.3 basis points (column (3), based on NBER business cycles). This is considerable empirical support for the prediction of Pástor and Veronesi (2013).

[22] In untabulated analyses, we also find that the general economic conditions affect the impact of control variables on offering yields. For example, the term spread affects borrowing costs positively in economic upturns but not in economic downturns; implied state ratings reduce borrowing costs in economic downturns but not in economic upturns. These observations justify the full-interaction models in equation (2), which allow the coefficients on each regressor to vary across different states of the economy.

5 Variation in Uncertainty and Impact of Elections

Our analysis so far shows that elections more than impact offering yields pervasively – the impacts also vary with economic conditions. Hence we further explore these impacts on offering yields by exploiting differing degrees of political uncertainty induced by elections across states and over time. We consider three types of variations: the predictability of an election's outcomes; the status of state government finance; and the restriction of fiscal and budgetary policies embedded in a state's institutions.

5.1 Predictability of an election's outcomes

The impact of an election depends on the predictability of its outcomes. A highly predictable election induces little uncertainty, *ceteris paribus*. We consider two *ex ante* measures that capture the predictability of an election's outcome. The first measure is the fraction of undecided votes prior to the election. The higher the percentage of undecided votes, the more uncertain the election's outcome. The indicator variable, *Undecided Votes*, takes a value of one when the percentage of undecided votes in the poll is above the historical median in the state, and zero otherwise.[23]

The second measure explores whether an election involves an incumbent facing term limits. Ansolabehere and Snyder (2002) show that the advantage of incumbency is an important predictor of any executive or legislative election's outcomes. An election in which an incumbent is facing term limits and is ineligible for re-election introduces more uncertainty than an election in which the incumbent is running for re-election. The indicator variable, *Term Limit*, takes a value of one if the incumbent faces term limits, and zero otherwise.

To make the comparison transparent, we also present estimates of regression model (1) in various subsamples. To test the differences, following Julio and Yook (2012a), we estimate the regression:

$$y_{ijtk} = \alpha_j + \gamma_t + m_k + \beta_0 \times Election_{jtk} + \beta_1 \times Election_{jtk} \times Z_{jtk} + \sum \boldsymbol{\varphi}_i \mathbf{X}_i + \sum \boldsymbol{\delta}_j \mathbf{S}_{jtk} + \varepsilon_{ijtk} \quad (3)$$

where Z_{jtk} is the indicator variable that captures the predictability of an election's outcomes. The coefficient of interest is β_1 , which reveals whether an election with less (more) predictable outcomes

[23] In untabulated analysis, instead of the binary variable we use the continuous variable of the percentage of undecided votes. The results are similar.

has a greater (lesser) impact on the offering yields. Panel A in Table 6 summarizes these estimates.

Columns (1) and (2) compare the impact of an election on offering yields when the fraction of undecided votes is low or high. When the fraction of undecided votes is high, or in an election with less predictable outcomes, election's impact on offering yield is 11.7 basis points (t-statistic = 4.37); and when the fraction of undecided votes is low, election's impact on offering yield is 5 basis points (t-statistic = 2.31). Again, this is an economically large difference. In fact, the yield difference between high-yield bonds and investment-grade bonds in our sample is about 6 basis points.

Column (3) directly compares two types of elections – high vs. low fraction of undecided votes. The variable of interest, *Election* × *Undecided Votes*, shows that for an election with a higher fraction of undecided votes, a concurrently issued municipal bond commands a 12.2 basis point higher yield (t-statistic = 3.07).[24]

Columns (4) and (5) from Panel A compare offering yields of bonds issued during election period when the incumbent does or does not face the term limit. As we expect, when the incumbent is not eligible for re-election and the outcome of an election is therefore less certain, the election's impact on bond offering yields is 11.4 basis points (t-statistic = 4.76). When the incumbent does not face term limits, the election's impact on bond offering yields is 5.1 basis points (t-statistic = 3.46). Column (6) makes a direct comparison of an election's offering yields of bonds issued when the incumbent faces term limit or no term limit. An election's impact on bond offering yields is higher by 4.8 basis points (t-statistic = 2.05).

5.2 Status of state government finance

Electoral uncertainty may have a greater impact if a state's government finance is particularly sensitive to potential policy changes. To gauge the status of state financing, we consider government debt outstanding to state gross domestic product (debt/GDP) ratio and state government deficits. When the debt/GDP ratio is higher within a state, or state government runs a deficit, the marginal impact of political uncertainty induced by an election on offering yields is expected to be stronger, as potential policy changes have more of an impact on the ability of a state to serve its debt

[24] We also tried to control the fraction of undecided votes at the time of election. The results are similar. For an election with a higher fraction of undecided vote, an issue commands a 10.5 basis point higher yield (t-statistic = 3.22). We prefer the specification reported in column (3), because the fraction of undecided votes is not yet known during a governor's tenure but it is when a the poll is conducted immediately before an election. Julio and Yook (2012a) implement similar specification (see, table VI in their paper).

obligations. Empirically we consider two indicator variables. The first indicator variable, *Debt/GDP Ratio*, equals one if a state's government debt/GDP ratio is above its historical median during the election period, and zero otherwise. The second indicator variable, *Deficit*, equals one if a state's total expenditure exceeds its total revenue in a particular fiscal year, and zero otherwise. Because debt/GDP ratio and government deficit can affect yields, we also include them as controls.

To test these ideas, in addition to estimating regression model (1) in various subsamples, we estimate the regression:

$$\begin{aligned} y_{ijtk} &= \alpha_j + \gamma_t + m_k + \beta_0 \times Election_{jtk} + \beta_1 \times Election_{jtk} \times Z_{jtk} + \beta_2 \times Z_{jtk} \\ &\quad + \sum \boldsymbol{\varphi}_i \mathbf{X}_i + \sum \boldsymbol{\delta}_j \mathbf{S}_{jtk} + \varepsilon_{ijtk} \end{aligned} \tag{4}$$

where Z_{jtk} is the indicator variable related to the government debt/GDP ratio or deficit. Estimates of coefficient β_1 indicate an election with a higher (lower) debt/GDP ratio, or when the state government has a deficit (or has no deficit) has a greater (lesser) impact on offering yields. The average effect of the government debt/GDP ratio and deficits on offering yields during both an election period and a non-election period is captured by the coefficient estimate of β_2.

Panel B in Table 6 summarizes these estimates. Note columns (1) and (2) that if an election takes place when a state's government debt/GDP ratio is above its historical median, an election's impact on offering yield is 5.3 basis points (t-statistic = 2.90). Otherwise, the election's impact is similar but statistically insignificant. Column (3) shows that a state with relatively high government debt/GDP ratio at the time of election faces an additional 7.5 basis points (t-statistic = 2.84) borrowing cost. Interestingly, a higher level of state government debt/GDP ratio by itself does not translate into a higher borrowing cost.

The last columns in Panel B focus on the impact of election on offering yields under a deficit or no deficit. When an election coincides with deficit (column (5)), the impact of election on offering yield is 12.8 basis points (t-statistic = 3.42). Otherwise (column (4)), the impact of election on offering yield is merely 2.4 basis points (t-statistic = 2.84). Column (6) directly compares the impact of election on offering yields under different conditions. The difference is economically quite large (5.8 basis points) but statistically insignificant (t-statistic = 1.52).

5.3 State institutional restrictions

An election's impact also depends on the state-level institutional features. Poterba and Rueben (1999) shows that a state's institutional restrictions affect municipal bond yields. For example, a state with tax limits faces higher borrowing costs than a state without tax limits. And a state with expenditure limits on average can borrow at a lower rate than a state without expenditure limits. Baber and Gore (2008) show that adoption of generally accepted accounting principles (GAAP) in the budgeting process reduces municipal bond offering yields, due to an increase in transparency.

These average effects are not the mechanisms we examine here. We are rather more interested in determining, when restrictive institutional constraints are in place, whether this mitigates the impact of political uncertainty's on public financing costs *during the election period*. In the most extreme case, if elected officials are completely constrained by existing institutional restrictions, they have little real power, and an election by itself introduces little real uncertainty, regardless of how uncertain an election's outcome is.

We focus on several state institutional restrictions, including a state's adoption of revenue-raising limits, tax-increase limits, and spending-increase limits, and its adoption of GAAP.[25] Because these constraints impose restrictions on policy changes or policy makers' discretion, they may mitigate the impact of election-related political uncertainty on public debt financing costs. More specifically, the indicator variables take a value of one if the state has revenue limits, spending limits, and tax raise limits in place, and GAAP-based budgeting, and zero otherwise. From Poterba and Rueben (1999), we obtain the state balanced budget stringency index and create an indicator, *Balanced-budget Restriction*, which equals one if a state's index is above the median value of 8, and zero otherwise.

Panel C of Table 6 presents estimates of regression model (4) with various institutional restrictions. The primary variable of interest is β_1 , which indicates whether a particular fiscal restriction mitigates or exacerbates the impact of an election on offering yields. We are also interested in the *average* effect of the institution on offering yields during both an election period and a non-election period, i.e., the coefficient estimate of β_2.

Several interesting findings emerge. First, column (3) shows that adoption of GAAP reduces

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

offering yields by 11.5 basis points; it also mitigates the impact of elections by an *additional* 3.5 basis points (t-statistic $= -1.96$). Second, when revenue limits are in place, offering yields increase by 12.8 basis points (t-statistic $= 2.02$), but revenue limits reduce the impact of elections on borrowing costs (although not statistically significant), as shown in column (6). Third, some state restrictions, such as spending limits or tax increase limits have incremental effects on offering yields during elections. Specifically, a state with spending limits on average experiences about 4.2 basis points lower financing costs (t-statistic $= -2.62$), while a state with tax-increase limits on average pays 2.8 basis points less during the election period (t-statistic $= 1.90$). The balanced-budget restriction reduces on average borrowing costs by 4.4 basis points during the election period (t-statistic $= -1.75$). In summary, while state institutional features may positively or negatively affect average yields, on balance they attenuate uncertainty induced by elections, and reduce offering yields during the election period.

6 How Does an Election Impact Public Financing Costs?

How does political uncertainty induced by elections affect the borrowing costs of municipal bonds? One channel envisioned by Pástor and Veronesi (2012, 2013) is that investors demand compensation for bearing political uncertainty. During the election period, investors in municipal bonds are uncertain about several prospects: (1) who will win the election, (2) the policy preferences of elected officials, and (3) the policy effects on the economy. After an election, uncertainty about the winner of the election is resolved, but uncertainty remains as to the newly elected official's policy preferences and the impact of these policies. The net effect is that overall political uncertainty is reduced.

Our empirical evidence so far is consistent with the theoretical models in Pástor and Veronesi (2012, 2013). Yet there are other potential channels that may also explain temporary escalation of municipal bond offering yields. Our examination of these alternatives provides further evidence that is more consistent with an explanation based on political uncertainty.

6.1 Elections and timing of bond issuance

The timing of election is predetermined, and issuers of municipal bonds can choose when to issue. Timing endogeneity may possibly bias our estimate of an election's impacts on offering yields. It could be that, facing uncertainty, agents choose to delay investment until the uncertainty is resolved (see, Bernanke, 1983; among others). Whatever the important organizational and incentive differences between private and public sectors, one can argue that bond issuers (i.e., end-users of the capital) might delay issuance after the election and avoid paying higher borrowing costs. Yet to the extent that we observe bond issuance during the election period, there might be a subtle self-selection effect.

To understand this effect, let us assume issuers have a menu of bond issuance choices. The first group of bonds must be offered *immediately* to fulfill urgent public financing needs. Moreover, for some exogenous reasons unrelated to political uncertainty, the first group of bonds commands higher offering yields. The second group of bonds should be offered but does not have to be offered immediately. The second group of bonds demands lower offering yields. In the absence of election induced political uncertainty, all bonds are offered, and the average yield is the yield during the non-election period. During an election, however, if only the first group is offered, we observe higher offering yields. Although higher offering yields still reflect political uncertainty-induced distortion of public financing in terms of capital formation, they do not directly imply that political uncertainty affects offering yields.

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

While such scenarios are plausible, several findings so far are inconsistent with them. First, municipal bonds issued during election periods are not of poorer credit quality, given their ratings. In fact, last row in Table 3 shows that the opposite is true. Second, in the subsample of rollover

bonds (see, column (6) of Table 4), which are less likely to be affected by timing considerations, we find almost identical results showing the impact of elections on offering yields.

We can also offer a more direct test to address these concerns. Our test examines the yields associated with secondary market traded *seasoned bonds* issued *during non-election periods*. We focus on state-level municipal bond portfolio yields provided by Bloomberg Fair Value Muni Index to circumvent issues related to municipal bond illiquidity.[26]

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 election period, and Panel B seasonal adjusted market yield spreads. The patterns observed here are very similar to those of the Treasury maturity-matched offering yield spreads in Figure 2. Secondary market yield spreads gradually widen as elections approach, and then narrow after elections.

Moreover, the patterns are remarkably consistent across different maturities. Panels C and D provide the time-series evolution of secondary market yield spreads over calendar months during election years (Panel C) and non-election years (Panel D). Panel C shows a widening of yield spreads before elections and then a drop afterward. Panel D reveals no such pattern in years when there is no election.

Table 7 examines how elections impact the yield of the state-level municipal bond index. The regression specifications are similar to equation (1), but without individual 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, in which the dependent variable is 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-statistic = 2.95). That is, the state-level municipal bond index yield increases by 6.5 basis points during an election period, a magnitude comparable to our baseline estimate of 7.2 basis points, reported in column (4) of Table 4. Columns (2) – (5) split the sample by maturities, from 1-year to 20-year. The point estimates range from 4 basis points (t-statistic = 2.27) for the 1-year bond index to 10.8 basis points (t-statistic = 3.26) for the 5-year bond index. Overall,

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

evidence from the secondary market suggests that timing endogeneity does not explain the higher debt financing costs prior to elections.

6.2 Elections and political business cycles

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

Several pieces of evidence are inconsistent with this hypothesis. First, the political business cycles hypothesis does not predict a unambiguous pattern of bond yield reversals for both newly issued and seasoned bonds around the election. Yet we observe municipal bond yield increases during periods leading up to elections and then subsequently precipitous decreases in both primary and secondary markets.[27] Second, there is little incentive for incumbents facing term limits and ineligible for re-election to manipulate policy in order to win re-election. Nevertheless, we find that bonds issued during the period when the incumbent facing term limit demand a 3 basis point higher offering yield (see Table 4).

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

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

Besley and Case (1995) find that state taxes and government spending increase when an incumbent Democratic governor faces term limit. Consistent with their study, we find state capital outlays increases when a Democratic incumbent faces term limit. But again this evidence is inconsistent with the political business cycle hypothesis, which suggests weaker political motivation for an incumbent who faces term limits and is ineligible for re-election.

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

Overall, we find little evidence that supports the political business cycle hypothesis in the case of U.S. gubernatorial elections. While our results seem disappointing, they are consistent with prior empirical literature on the political business cycle hypothesis in democratic countries. For example, Besley and Case (2003) find similar evidence after taking into account state fixed-effects. Peltzman (1992, p.329) concludes "[in the U.S.] voters are not easily 'bought off' by election year spending. Spending just prior to an election is even more poisonous politically than in other periods."

6.3 Aversion to political uncertainty

The basic premise of Pástor and Veronesi (2012, 2013) is that investors are averse to political uncertainty and demand compensation for bearing it. Our evidence so far suggests investors indeed demand high premiums for bearing such an uncertainty. By exploring secondary market trading behavior of municipal bond investors, we provide further evidence that investors are averse to political uncertainty induced by elections.

In the prototype model of investment under uncertainty (see, Bernanke (1983), Bloom, Bond, and Van Reenen (2007), among others), a firm facing rising uncertainty exercises the option to wait. Investors encountering uncertainty similarly choose to reduce market participation. 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. The investors who step in and provide liquidity demand extra compensation. This idea is particularly relevant for investors in municipal bonds. A key ingredient of the model in Bernanke (1983) is irreversible investment, which makes the option to wait valuable. For investors in municipal bonds, because trading costs associated with municipal bonds are notoriously high, a similar argument applies.

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

$$\begin{aligned} \#TotalTrades_{ijtk} &= \#Buy\ Trades_{ijtk} + \#Sell\ Trades_{ijtk} \\ \#NetBuys_{ijtk} &= \#Buy\ Trades_{ijtk} - \#Sell\ Trades_{ijtk} \end{aligned} \tag{5}$$

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

Our regression model is specified as,

$$y_{jtk} = \alpha_j + \gamma_t + m_k + \beta \times Election_{jtk} + \sum \boldsymbol{\delta}_j \mathbf{S}_{jtk} + \varepsilon_{jtk} \tag{6}$$

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

Schultz (2012) makes a distinction between transactions in *newly issued bonds* and *seasoned bonds*. In practice, if a bond is issued at least 30 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 a bond (i.e., "pre-positioning"). 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 the customers who decide to participate in the offering process (and all recorded in the dataset). The reported transactions of newly issued bonds are "censored" in this sense, and do not precisely reflect investors' demand.

After initial placement of a bond, investors usually hold it for long-term investment purposes. Thus most of the customer transactions of a seasoned bond are buyer-initiated. For a seasoned bond already traded on the secondary market, dealers stand by and make the market by taking necessary inventory positions. A complete set of records of customer buys and sells allows us to see the "uncensored" demand. To identify investors' demand, we naturally focus on seasoned bond trading, although we report the trading of newly issued bonds and the trading of all bonds for comparison.

Table 8 compares the numbers of total trades and net buys during election periods with non-election periods. The numbers of total trades and net buys significantly drop during election periods. These estimates are statistically significant at the 5% level or better, and the economic magnitude is also considerable. For the full sample of newly issued bonds and seasoned bonds, the number of total trades drops by 6.5% (= 4.579/70.58, where 70.58 is the number of total trades in hundreds during non-election periods), while the number of net buys drops 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 drops 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 drops 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).

Evidence from secondary market transactions suggests overall that demand due to uncertainty aversion is the driving force behind the higher offering yields during election periods.

7 Robustness Checks and Other Tests

We conduct a number of robustness checks. The first set uses different definitions of election periods. The results are provided in Table 9. Column (1) reproduces our main results in Table 4. In column (2), we expand the election period window from six months before the election (inclusive) to one month before (inclusive). Since in most states elections take place in November, under this definition, the election period runs from to May 1 through October 31. The point estimate of *Election* is 0.056 (t-statistic = 4.29). In column (3), we expand the election period window from January 1 of the election year to one month before (inclusive). The point estimate of *Election* is 0.029 (t-statistic = 1.86). Taken together, columns (1) through (3) show that the longer the window of the election period, the lower the impact of the election on offering yields.

In column (4), we study offering yields during two windows, 6 months prior to the election and 6 months after the election (including the month of election). The offering yield increases by 5.3 basis points in the six month period leading up to an election, followed by a statistically significant yield decline of 2.7 basis points (t-statistic = -2.60). The sum of yield changes from these two windows is not statistically different from zero (F-statistic = 2.48, p-value > 0.10). Thus the spike in offering yields prior to the election is completely reverted back after the election.

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

demand higher offering yields.

8 Conclusion

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

First, we find that offering yields of municipal bonds temporarily increase by 6 to 8 basis points during an election period. Bonds issued in states where an incumbent governor faces term limits are associated with offering yields that are 3 basis points higher.

Second, the impact of political uncertainty on public financing costs varies systematically with local economic conditions. Consistent with the theoretical prediction by Pástor and Veronesi (2013), the impact of political uncertainty on public financing costs is more pronounced during local economic contractions.

Third, we investigate how the levels of uncertainty affect the impact of elections on public debt borrowing costs. We find that an election with less predictable outcomes has a stronger impact on yields. The impact of an election is stronger when a state faces a higher level of government debt. Several state fiscal and budgetary characteristics, such as GAAP-based budgeting, tax-raising limits, and spending-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. Evidence in the prices and transactions of municipal bonds in the secondary market suggests that investors are averse to political uncertainty and that they demand compensation for bearing such uncertainty during an election period. We can conclude that temporary increase in risk premium due to political uncertainty is the driving force behind the higher offering yields during the election periods.

Several interesting questions remain for future research. For example, if political uncertainty affects public financing costs, is it possible for municipal bond issuers to hedge this uncertainty? If

during any year, some states hold gubernatorial elections while other states do not, is it possible for different states to set up a coinsurance scheme to reduce the adverse impact of political uncertainty? How could one solve the adverse selection and moral hazard problems would such a coinsurance scheme?

References

Akhmedov, Akhmed, and Ekaterina Zhuravskaya, 2004, Opportunistic political cycles: test in a young democracy setting, *Quarterly Journal of Economics* 119, 1301-1338.

Alesina, Alberto, 1987, Macroeconomic policy in a two-party system as a repeated game, *Quarterly Journal of Economics* 102, 651-678.

Ang, Andrew, Vineer Bhansali, and Yuhang Xing, 2010, Taxes on tax-exempt bonds, *Journal of Finance* 65, 565-601.

Ang, Andrew, and Francis A. Longstaff, 2012, Systemic sovereign credit risk: lessions from the U.S. and Europe, Working Paper, Columbia University and UCLA.

Ansolabehere Stephen, and James M. Snyder, Jr., 2002, The incumbency advantage in U.S. elections: an analysis of state and federal offices, 1942-2000, *Election Law Journal: Rules, Politics, and Policy* 1, 315-338.

Baber, William R., and Angela K. Gore, 2008, Consequence of GAAP disclosure regulation: evidence from municipal debt issues, *The Accounting Review* 83, 565-591.

Belo, Frederico, Vito D. Gala, and Jun Li, 2013, Government spending, political cycles, and the cross-section of stock returns, *Journal of Financial Economics* 107, 305-324.

Bergstresser, Daniel, Randoph Cohen, and Siddharth Bhaskar Shenai, 2011, Skin in the game: the performance of insured and uninsured municipal debt, Working Paper, Harvard Business School.

Bernanke, Ben S.,1983, Irreversibility, uncertainty, and cyclical investment, *Quarterly Journal of Economics* 98, 85–106.

Besley, Timothy, Torsten Persson, and Daniel M. Sturm, 2010, Political competition, policy and growth: theory and evidence from the U.S., *Review of Economic Studies* 77, 1329-1352.

Besley, Timothy, and Anne Case, 1995, Does electoral accountability affect economic policy choices? Evidence from gubernatorial term limits, *Quarterly Journal of Economics* 110, 769-798.

Besley, Timothy and Anne Case, 2003, Political institutions and policy choices: evidence from the United States, *Journal of Economic Literature* 41, 7-73.

Bloom, Nicholas, Stephen Bond, and John Van Reenen, 2007, Uncertainty and investment dynamics, *Review of Economic Studies* 74, 391–415.

Boutchkova, Maria, Hitesh Doshi, Art Durnev, and Alexander Molchanov, 2012, Precarious politics and return volatility, *Review of Financial Studies* 25, 1111-1154.

Butler, Alexandar, W., Larry Fauver, and Sandra Mortal, 2010, Corruption, political connections, and municipal finance, *Review of Financial Studies* 22, 2873-2905.

Capeci, John 1994, Local fiscal policies, default risk, and municipal borrowing cost, *Journal of Public Economics* 53, 73-89.

Chalmers, John M.R., 1998, Default risk cannot explain the muni puzzle: evidence from U.S. government secured municipal Bonds, *Review of Financial Studies* 11, 281-308.

Cohen, Lauren, Joshua Coval, and Christopher Malloy, 2011, Do powerful politicians cause corporate downsizing? *Journal of Political Economy* 119, 1015-1060.

Collin-Dufresne, Pierre, Robert S. Goldstein, and J. Spencer Martin, 2001, The determinants of credit spread changes, *Journal of Finance* 56, 2177-2207.

Duffie, Darrell, 2010, Presidential address: asset price dynamics with slow-moving capital, *Journal of Finance* 65, 1237-1267.

Duffie, Darrell, Lasse Heje Pedersen, and Kenneth J. Singleton, 2003, Modeling sovereign yield spreads: a case study of Russian debt, *Journal of Finance* 58, 119-160.

Duffie, Darrell, and Kenneth J. Singleton, 1999, Modeling term structures of defaultable bonds, *Review of Financial Studies* 12, 687-720.

Durnev, Art, 2010, The real effects of political uncertainty: elections and investment sensitivity to stock prices, Working Paper, University of Iowa.

Epple, Dennis, and Chester Spatt, 1986, State restrictions on local debt: their role in preventing default, *Journal of Public Economics* 29, 199-221.

Green, Richard C., 1993, A simple model of the taxable and tax-exempt yield curves, *Review of Financial Studies* 6, 233-264.

Green, Richard C., Burton Hollifield, and Norman Schurhoff, 2007a, Financial intermediation and costs of trading in an opaque market, *Review of Financial Studies* 20, 275-314.

Green, Richard C., Burton Hollifield, and Norman Schurhoff, 2007b, Dealer intermediation and price behavior in the aftermarket for new bond issues, *Journal of Financial Economics* 86, 643-682.

Green, Richard C., Dan Li, and Norman Schurhoff, 2010, Price discovery in illiquid markets: do financial asset prices rise faster than they fall, *Journal of Finance* 65, 1669-1702.

Greenwood, Robin, and Dimitri Vayanos, 2010, Price pressure in the government bond market, *American Economic Review: Papers and Proceedings 100*, 585-590.

Harris, Lawrence E., and Michael S. Piwowar, 2006, Secondary trading costs in the municipal bond market, *Journal of Finance* 61, 1361-1397.

Hibbs, Douglas A., Jr. 1977, Political parties and macroeconomic policy, *American Political Science Review* 71, 1467-1487.

Julio, Brandon, and Youngsuk Yook, 2012a, Political uncertainty and corporate investment cycles, *Journal of Finance* 67, 45-83.

Julio, Brandon, and Youngsuk Yook, 2012b, Political uncertainty, irreversibility, and cross-border flows of capital, Working Paper, London Business School.

Kramer, Gerald H., 1971, Short term fluctuations in U.S. voting eehavior, 1896-1914, *American Political Science Review* 65, 131-143.

Krishnamurthy, Arvind, and Annette Vissing-Jørgensen, 2012, The aggregate demand for treasury debt, *Journal of Political Economy* 120, 233-267.

Kueng, Lorenz, 2012, Tax news: identifying the household consumption response to tax expectations using municipal bond prices, Working Paper, Northwestern University.

Longstaff, Francis A., 2011, Municipal debt and marginal tax rates: is there a tax premium in asset prices? *Journal of Finance* 66, 721-751.

Nanda, Vikram, and Rajdeep Singh, 2004, Bond insurance: what is special about munis? *Journal of Finance* 59, 2253-2279.

Nordhaus, William D., 1975, The political business cycles, *Review of Economic Studies* 42, 169-190.

Novy-Marx, Robert, and Joshua D. Rauh, 2012, Fiscal imbalances and borrowing costs: evidence from state investment losses, *American Economic Journal: Policy* 4**,** 182-213.

Pástor, Luboš, and Pietro Veronesi, 2012, Uncertainty about government policy and stock prices, *Journal of Finance* 67, 1219-1264.

Pástor, Luboš, and Pietro Veronesi, 2013, Political uncertainty and risk premia, *Journal of Financial Economics*, Forthcoming.

Peltzman, Sam, 1992, Voters as fiscal conservatives, *Quarterly Journal of Economics* 107, 327-361.

Peltzman, Sam, 1987, Economic conditions and gubernatorial elections, *American Economic Review: Papers and Proceedings* 77, 293-297.

Petersen, Mitchell A., 2009, Estimating standard errors in finance panel data sets: comparing approaches, *Review of Financial Studies* 22, 435-480.

Poterba, James M., 1994, State response to fiscal crises: the effects of budgetary institutions and politics, *Journal of Political Economy* 102, 799-821.

Poterba, James M., and Kim Rueben, 1999, State fiscal institutions and the U.S. municipal bond market, Chapter in *Fiscal Institutions and Fiscal Performance*, University of Chicago Press.

Previdi, Jeffrey, Christopher Krahe, Lisa Schroeer, Horacio Aldrete-Sanchez, Karl Jacob, Matthew Reining, and Jane Hudson Ridley, 2012, U.S. local governments: methodology and assumptions, Technical Paper, Standard & Poor's.

Santa-Clara, Pedro, and Rossen Valkanov, 2003, The presidential puzzle: political cycles and the stock market, *Journal of Finance* 58, 1841-1872.

Shenai, Siddharth Bhaskar, Randolph B. Cohen, and Daniel Bergstresser, 2010, Financial guarantors and the 2007-2009 credit crisis, Working Paper, Harvard Business School.

Schultz, Paul, 2012, The market for new issues of municipal bonds: the roles of transparency and limited access to retail investors, *Journal of Financial Economics* 104, 492-512.

Schultz, Paul, 2013, State taxes, local bias and differences in municipal bond yields across states, Working Paper, University of Notre Dame.

Trzcinka, Charles, 1982, The pricing of tax-exempt bonds and the miller hypothesis, *Journal of Finance* 37, 907-923.

Wang, Junbo, Chunchi Wu, Frank Zhang, 2008, effects of liquidity on relation between tax-exempt and taxable yields, *Journal of Banking & Finance* 32, 1133-1149.

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

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

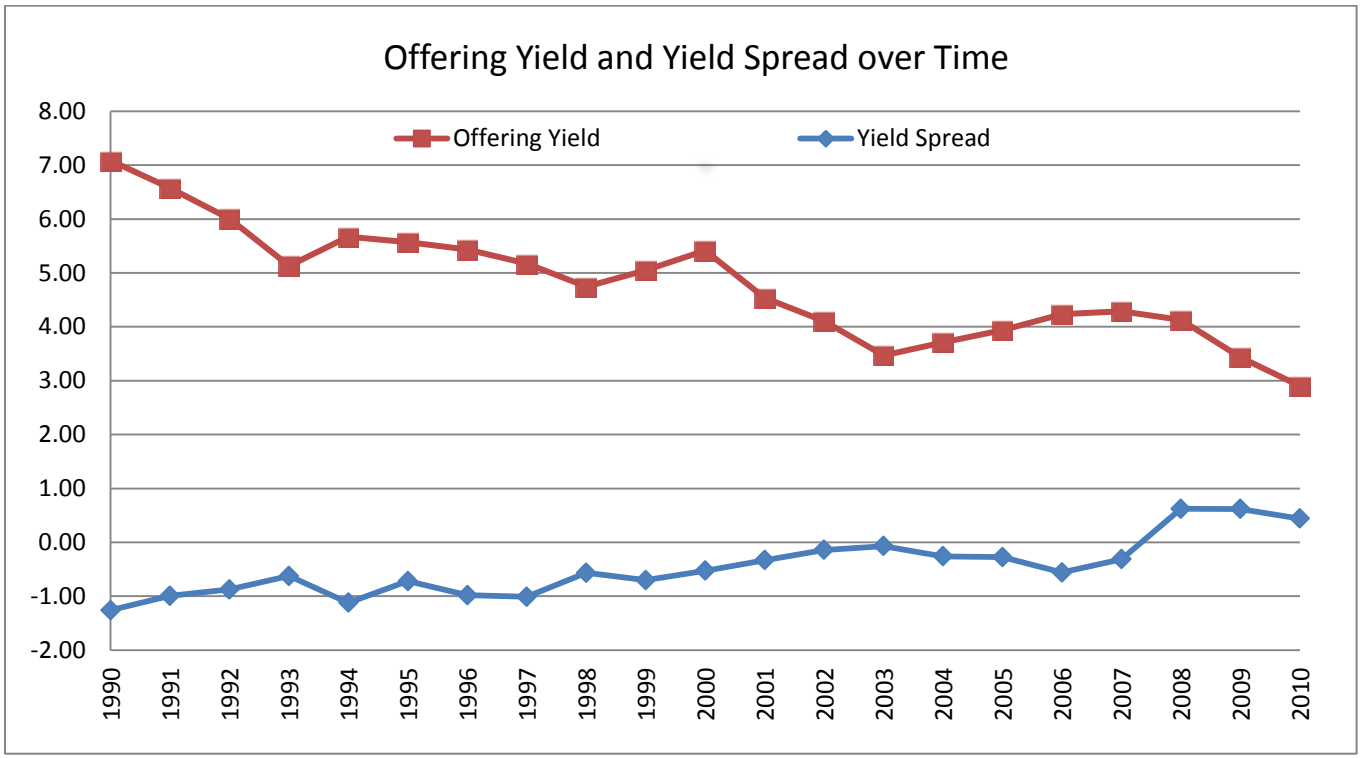

Figure 2: Bond Yield during Election Periods

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

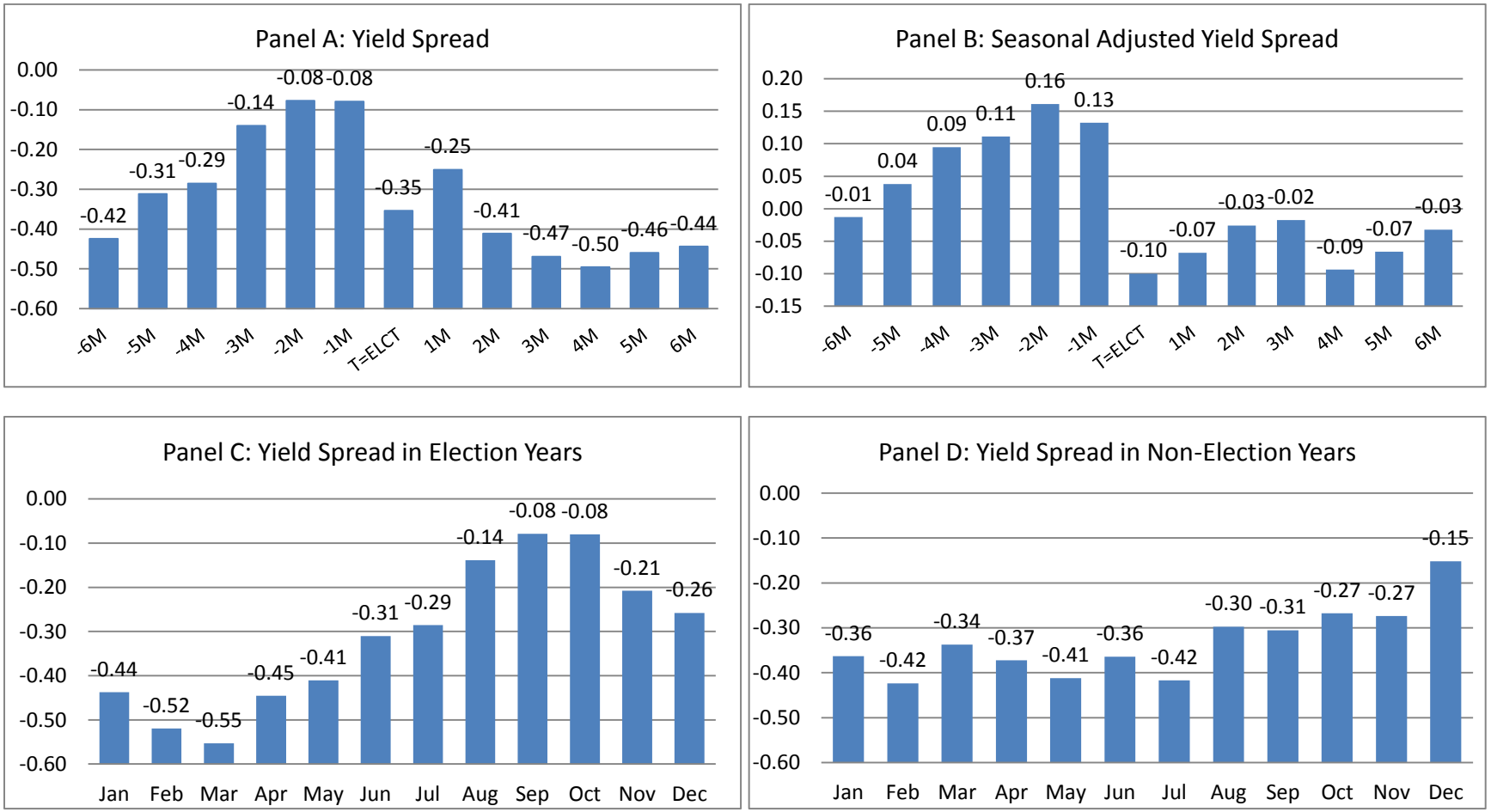

Figure 3: Impact of Elections on State-Level Municipal Bond Index Yield Spreads

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

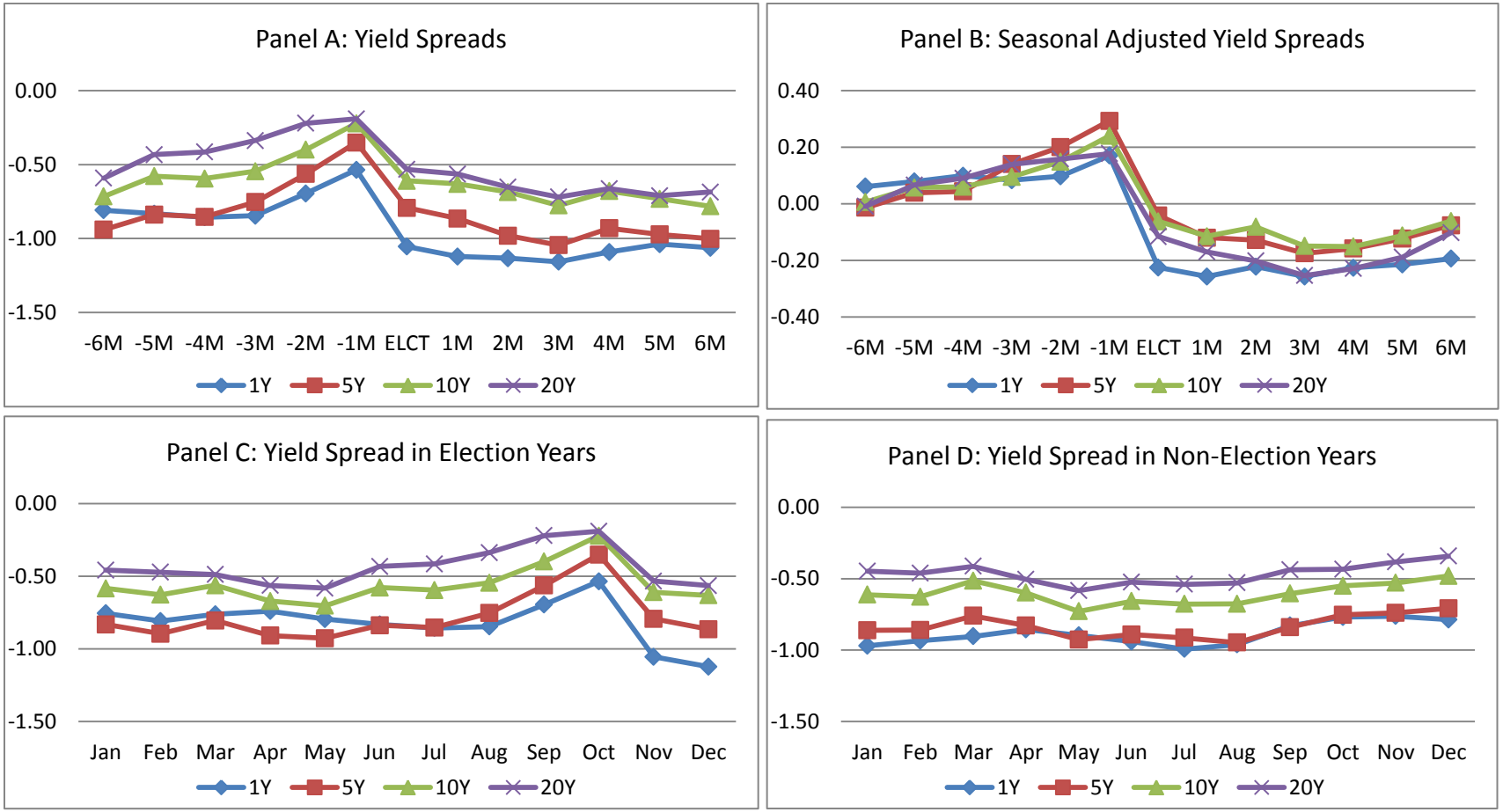

Table 1: Summary Statistics of the Municipal Bonds Sample

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

Panel A: Descriptive Statistics by State

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

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

Table 2: Summary Statistics of Selected Variables

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

Panel A: Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Election Period – Fiscal	121,503	0.08	0.26	0	1.00
Election Period – 6 months	121,503	0.15	0.36	0	1.00
Election Period – Calendar	121,503	0.25	0.43	0	1.00
Term Limited or Retiring	121,503	0.39	0.49	0	1.00
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	1.00	1202
Benchmark Treasury Yield	121,503	4.75	1.41	0.28	8.92
Total Income Tax Rate	115,632	41.10	3.32	28.00	48.15
Term Spreads	121,503	1.73	-1.27	0.70	3.69
G.O. Bond	121,503	0.47	0.50	0	1.00
Competitive Offering	121,503	0.18	0.38	0	1.00
Insured Bond	121,503	0.46	0.50	0	1.00
Additional Credit	121,503	0.12	0.33	0	1.00
Pre-Refunded Bond	121,503	0.16	0.37	0	1.00
Callable	121,503	0.56	0.33	0	1.00
Rollover Bond	121,503	0.39	0.49	0	1.00
Non-Investment Grade	121,503	0.52	0.50	0	1.00
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
GDP Growth Rate (annual)	121,503	0.03	0.25	-0.11	0.14
Unemployment Rate	121,503	5.55	1.70	2.10	14.5
Economic Leading Index	121,503	1.00	1.44	-9.50	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	2.00	22.00
GAAP	121,503	0.49	0.50	0	1.00
Revenue Limit	121,503	0.16	0.36	0	1.00
Spending Limit	121,503	0.44	0.50	0	1.00
Tax-Increase Limit	121,503	0.31	0.46	0	1.00
Balanced-Budget Stringency index	121,503	7.71	2.37	0	10.00

Panel B: Correlation Coefficients of Key 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 Spreads	(7)	**-0.08**	**-0.21**	-0.01	**-0.11**	**-0.32**	**-0.14**	1.00						
G.O. Bond	(8)	0.00	**-0.25**	**-0.16**	**-0.30**	**-0.12**	**0.01**	**0.02**	1.00					
Competitive Offering	(9)	**-0.03**	**-0.31**	**-0.09**	**-0.17**	**-0.31**	**-0.18**	**0.02**	**0.14**	1.00				
Insured Bond	(10)	**0.02**	**-0.09**	**0.18**	**-0.02**	**0.05**	**-0.02**	**-0.10**	**0.08**	**-0.04**	1.00			
Additional Credit	(11)	-0.01	**-0.12**	0.00	**-0.02**	**-0.09**	**-0.12**	**-0.04**	**0.20**	**0.09**	**-0.04**	1.00		
Callable	(12)	0.00	**0.48**	**0.15**	**0.67**	**0.32**	**0.02**	**-0.13**	**-0.19**	**-0.10**	**0.02**	**0.03**	1.00	
Non-investment Grade	(13)	**-0.02**	**0.11**	**-0.26**	**0.07**	**-0.05**	**-0.01**	**0.04**	**-0.10**	**0.04**	**-0.30**	**-0.01**	**0.07**	1.00

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

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

	Non-election	Election	t-test
	(1)	(2)	(1) - (2)
Offering Yield (%)	4.408	4.531	-0.123***
	(1.226)	(1.143)	(-9.845)
Average Offering Amount (US$, in millions)	27.340	29.546	-2.205**
	(90.217)	(101.013)	(-2.021)
Time to Maturity (months)	155.450	158.697	-3.247***
	(81.251)	(81.454)	(-3.662)
G.O. Bond	0.467	0.473	-0.006
	(0.499)	(0.499)	(-1.112)
Competitive Offering	0.180	0.130	0.050***
	(0.384)	(0.337)	(13.421)
Insured Bond	0.456	0.497	-0.041***
	(0.498)	(0.500)	(-7.497)
Additional Credit Enhancement	0.125	0.117	0.008**
	(0.331)	(0.321)	(2.364)
Callable Bond	0.555	0.558	-0.003
	(0.334)	(0.332)	(-0.760)
Investment Grade Ratings	0.476	0.513	-0.037***
	(0.499)	(0.500)	(6.774)

Table 4: Elections and Municipal Bond Offering Yields

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

	Baseline	Bond Controls	State Controls	G.O Bonds	Insured Bonds	Rollover Bonds
	(1)	(2)	(3)	(4)	(5)	(6)
Election	0.081***	0.067***	0.070***	0.068***	0.066***	0.084***
	(3.46)	(4.48)	(5.29)	(3.98)	(6.51)	(6.17)
Term Limit	0.033**	0.041**	0.038***	0.029**	0.025*	0.028***
	(2.31)	(2.61)	(2.95)	(2.04)	(1.74)	(3.18)
Benchmark T-Bond Yield	0.951***	0.579***	0.595***	0.590***	0.601***	0.617***
	(89.10)	(43.10)	(42.50)	(21.6)	(26.8)	(48.5)
Total Income Tax Rate	0.025	0.003	-0.027*	-0.040*	-0.015	-0.050**
	(0.77)	(0.13)	(-1.96)	(-1.86)	(-0.90)	(-2.12)
Term Spread	-0.002	0.044***	0.046***	0.047***	0.041***	0.038**
	(-0.22)	(4.04)	(4.37)	(3.23)	(3.71)	(2.50)
Log(Offering Amount)		-0.042***	-0.044***	-0.027***	0.002	-0.026***
		(-4.35)	(-4.44)	(-6.60)	(0.29)	(-2.93)
Time to Maturity		0.004***	0.004***	0.005***	0.004***	0.004***
		(26.5)	(25.6)	(11.2)	(25.6)	(17.8)
G.O. Bond		-0.123***	-0.124***	dropped	0.005	-0.099***
		(-6.23)	(-6.09)		(0.33)	(-6.25)
Competition Offering		-0.115***	-0.110**	-0.017	-0.053**	-0.091**
		(-2.79)	(-2.66)	(-0.34)	(-2.09)	(-2.23)
Insured Bond		-0.236***	-0.240***	-0.090***	dropped	-0.196***
		(-7.72)	(-8.01)	(-3.68)		(-7.05)
Additional Credit		-0.171***	-0.166***	-0.129***	-0.052***	-0.136***
		(-3.19)	(-3.04)	(-3.00)	(-3.72)	(-3.55)
Callable Bond		0.276***	0.279***	-0.01	-0.002	0.284***
		(7.28)	(7.66)	(-0.097)	(-0.025)	(6.23)
Non-Investment Grade		0.066***	0.165***	0.085***	0.034***	0.131***
		(5.57)	(13.1)	(9.89)	(7.74)	(12.1)
Population Growth Rate			1.549	0.815	0.845	-0.794
			(1.36)	(0.84)	(1.02)	(-0.94)
Log(Real GDP)			0.281	0.25	0.357	0.091
			(1.32)	(0.97)	(1.41)	(0.76)
State GDP Growth Rate			0.081	0.224	0.192	-0.086
			(0.31)	(0.62)	(0.67)	(-0.32)
State Unemployment Rate			0.024	0.013	0.021	-0.0001
			(1.05)	(0.53)	(0.98)	(-0.011)

State Economic Leading Index			-0.076***	-0.088***	-0.054***	-0.077***
			(-4.68)	(-3.98)	(-3.93)	(-5.02)
State Government GDP/ Total GDP			3.898*	5.871*	3.49	2.127
			(1.91)	(1.80)	(1.30)	(1.34)
Debt/GDP Ratio			-1.26	-1.208	-0.88	-0.454
			(-0.94)	(-1.00)	(-0.89)	(-0.46)
Implied State Rating			-0.007***	-0.012***	-0.003	-0.002
			(-2.76)	(-2.98)	(-1.19)	(-0.61)
Constant	YES	YES	YES	YES	YES	YES
Capital Purpose Fixed-Effects	YES	YES	YES	YES	YES	YES
Month Fixed-Effects	YES	YES	YES	YES	YES	YES
Year Fixed-Effects	YES	YES	YES	YES	YES	YES
State Fixed-Effects	YES	YES	YES	YES	YES	NO
Observations	115,632	115,511	115,511	54,068	54,690	44,175
R-squared	0.69	0.80	0.81	0.88	0.90	0.86

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

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

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

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

This table evaluates the cross-sectional variations of election's impact on municipal bond's offering yields. Panel A examines the variation in the predictability of election outcomes, measured by the indicators of "*undecided vote,*" which is the percentage of undecided vote in the election poll and "*term limit,*" which equals 1 if incumbent governors are not eligible for re-election due to term limit or retirement and 0 otherwise. Panel B studies the variation of state government finance, proxies by "*Debt/GDP ratio,"* the ratio of state outstanding debt over state real GDP, and "*deficit,"* an indicator that equals 1 if a state's total expenditure exceeds its total revenue and 0 otherwise. Panel C investigates state institutions in which the indicator variable takes a value of 1 if the state has GAPP-based budgeting, revenue-limit, spending-limit, and tax-increase-limit are in place, respectively; and 0 otherwise. Balanced-budget restriction is an indicator that equals 1 if a state's balanced-budget stringency index is above the sample median of 8; and 0 otherwise. For each indicator, we first examine the subsamples divided by the indicator and then study the interaction between election and the indicator. All specifications include constant terms, bond characteristics controls, macroeconomic condition controls, and capital purpose, state, year, and month fixed-effects. The estimation method is weighted least squares (WLS), where the weight is the frequency of bond issuance per state. T-statistics, reported in parentheses, are calculated based on standard errors clustered by states. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Variation in Predictability of Election Outcomes

	Fraction of Undecided Vote			Term Limit		
	(1)	(2)	(3)	(4)	(5)	(6)
	Low Un-decided Vote	High Un-Decided Vote	Interacted	Without Term Limit	With Term Limit	Interacted
Election	0.050**	0.117***	0.042*	0.051***	0.114***	0.053***
	(2.31)	(4.37)	(1.97)	(3.46)	(4.76)	(3.01)
Election x Indicator			0.122***			0.047**
			(3.07)			(2.05)
Constant	Included	Included	Included	Included	Included	Included
Bond Characteristic Controls	YES	YES	YES	YES	YES	YES
Macroeconomics Controls	YES	YES	YES	YES	YES	YES
State Economics Controls	YES	YES	YES	YES	YES	YES
Capital Purpose Fixed-Effects	YES	YES	YES	YES	YES	YES
Month Fixed-Effects	YES	YES	YES	YES	YES	YES
Year Fixed-Effects	YES	YES	YES	YES	YES	YES
State Fixed-Effects	YES	YES	YES	YES	YES	YES
Observations	43,816	15,964	59,780	71,737	43,774	115,511
R-squared	0.79	0.80	0.80	0.81	0.80	0.81

Panel B: Variation in State Government Finance

	Debt/GDP Ratio			Deficit		
	(1)	(2)	(3)	(4)	(5)	(6)
	Low Debt Ratio	High Debt Ratio	Interacted	No Deficit	With Deficit	Interacted
Election	0.050	0.053***	0.032*	0.024***	0.128***	0.043***
	(1.52)	(2.90)	(1.94)	(2.84)	(3.42)	(4.33)
Indicator			-0.009			0.068*
			(-0.57)			(1.95)
Election x Indicator			0.075***			0.058
			(2.84)			(1.52)
Constant	Included	Included	Included	Included	Included	Included
Bond Characteristic Controls	YES	YES	YES	YES	YES	YES
Macroeconomics Controls	YES	YES	YES	YES	YES	YES
State Economics Controls	YES	YES	YES	YES	YES	YES
Capital Purpose Fixed-Effects	YES	YES	YES	YES	YES	YES
Month Fixed-Effects	YES	YES	YES	YES	YES	YES
Year Fixed-Effects	YES	YES	YES	YES	YES	YES
State Fixed-Effects	YES	YES	YES	YES	YES	YES
Observations	54,675	60,836	115,511	86,187	29,324	115,511
R-squared	0.78	0.82	0.81	0.80	0.76	0.81

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Panel C: Variation of State Institutions

	GAAP			Revenue Limit			Spending Limit			Balanced-Budget Restriction			Tax-Increase Limit		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	No	Yes	Inter-acted	No	Yes	Inter-acted	No	Yes	Inter-acted	No	Yes	Inter-acted	No	Yes	Inter-acted
Election	0.076**	0.070**	0.093***	0.073**	0.027	0.072***	0.077**	0.048*	0.090***	0.094**	0.018	0.082***	0.070**	0.039*	0.080***
	(5.43)	(3.29)	(6.11)	(4.91)	(1.19)	(5.02)	(6.57)	(2.57)	(7.09)	(9.46)	(0.74)	(8.83)	(4.32)	(2.94)	(4.39)
Indicator			-0.115**			0.128**			-0.048			-0.057			-0.64
			(-2.24)			(2.02)			(-1.08)			(-0.21)			(-0.69)
Election x Indicator			-0.035*			-0.018			-0.042**			-0.044*			-0.028*
			(-1.96)			(-0.73)			(-2.62)			(-1.75)			(-1.90)
Constant	Include	Include	Included	Include	Include	Included	Include	Include	Included	Included	Include	Included	Include	Include	Included
Bond Characteristic Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Macroeconomics Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
State Economics Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Capital Purpose Fixed-Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Month Fixed-Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed-Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
State Fixed-Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	58,682	56,829	115,511	97,230	18,281	115,511	64,605	50,906	115,511	65,834	49,677	115,511	79,063	36,448	115,511
R-squared	0.83	0.79	0.81	0.81	0.78	0.81	0.83	0.79	0.81	0.8	0.82	0.81	0.82	0.77	0.81

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

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

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

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

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

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

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

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

	(1)	(2)	(3)	(4)
Election Period – Fiscal	0.070***			
	(5.18)			
Election Period – 6 Month		0.056***		0.053***
		(4.29)		(4.32)
Election Period – Calendar			0.029*	
			(1.86)	
Post-Election Period – 6 Month				-0.027**
				(-2.60)
Constant	Included	Included	Included	Included
Bond Attributes Controls	YES	YES	YES	YES
Macroeconomics Controls	YES	YES	YES	YES
State Economics Controls	YES	YES	YES	YES
Capital Purpose Fixed-Effects	YES	YES	YES	YES
Year Fixed-Effects	YES	YES	YES	YES
Month Fixed-Effects	YES	YES	YES	YES
State Fixed-Effects	YES	YES	YES	YES
Observations	115,551	115,551	115,551	115,551
R-squared	0.81	0.81	0.81	0.81

Appendix A: Variable Definitions and Data Source

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

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

	SDC's bond rating. Combining the long-term rating by Moody's, S&P, and Fitch in order.	
Rating - Longest Maturity	Bond rating of the longest maturity in the issue at the time of issuance, augmented by the SDC's rating. Combining the long-term ratings by Moody's, S&P, and Fitch in order.	MBSD; SDC
Non-Investment	Flag indicating that bond is not rated or rated below BBB-.	MBSD; SDC
State-level Municipal Bond Index Yield	Monthly yield of state municipal bond index from 1996 to 2010.	Bloomberg
Total Number of Trades	Total number of trades of municipal bonds in secondary markets for each state per month.	MSRB
Number of Net Buy Trades	Number of buy trades minus the number of sell trades of municipal bonds in secondary markets for each state per month.	MSRB
	B. Election Variables	
Election Period – Fiscal	Indicator equals 1 if 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 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 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 bond was issued in the 6 months after the election date; it is 0 otherwise.	Constructed
Term Limit	Incumbent governor cannot stand for re-election due to either term limits or retirement.	Wikipedia & other sources
Undecided Votes	Indicator equals to 1 if the percentage of swing vote in the poll prior to election is above its historical median and 0 otherwise.	Polling the Nation (PTN)
	C. State Institution Variables	
GAAP	Flag indicating if the state has adopted generally accepted accounting principles.	NASBO
Revenue Limit	Flag indicating restrictions on state revenue.	NCSL, NASBO
Spending Limit	Flag indicating restrictions on state expenditures.	NCSL, NASBO
Tax Increase Limit	Flag indicating majority vote required in the legislature in order to raise taxes.	NCSL, NASBO
Balanced-Budget Stringency Index	An index of the stringency of balanced budget rule across states. The index ranges from 0 to 10. A higher score indicates stronger restriction on balanced budget in a	Poterba and Rueben (1999)

	state fiscal institution. See Poterba and Rueben (1999) for the construction of this index.	
	D. Macroeconomic Variables	
Total Income Tax Rate	Sum of the highest marginal federal income tax rate and the state income tax rate.	TAXSIM
Benchmark Treasury Yield	Maturity-matched Treasury yield.	CRSP
Term Spread	Difference of yield to maturity between 10-year T-Bond and 90-day T-bill, matched with the month of offering.	FRED
	E. State Economics Variables	
State Leading Index	Monthly state-level leading economic activity index.	Federal Reserve Bank of Philadelphia
State GDP Growth Rate	State annual real GDP growth rate.	BEA
Unemployment Rate	Monthly unemployment rate of the state.	BLS
Log(Real GDP)	Natural logarithm of state real GDP volume in 1997 dollars.	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.	SGF (1990 to 2006), U.S. Census (2007 – 2009)
Capital Outlay	State expenditure on capital outlay (infrastructure) in 1997 dollars.	SGF
Debt Outstanding /GDP	The ratio of state debt outstanding over GDP.	SGF& BEA
Total Income Tax Rate	Sum of federal income tax rate and state income tax rate.	NBER
State Ratings	Annually updated state credit ratings.	U.S. Census (1995-2009)
Implied State Ratings	Highest bond rating associated with the state in a given quarter, constructed using the municipal bonds sample.	MBSD, SDC

Appendix B: Effect of Political Business Cycles on State Policies

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

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

Appendix C: Impact of Elections on Bond Issuance Amount

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

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