Political Bonds: Political Hazards and the Choice of Municipal Financing Instruments*

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Abstract

We study the link between the choice of rule-based contracts and political competition through the municipal bond market. We provide evidence that when the probability of losing office is high, mayors are more likely to issue revenue bonds over general obligation bonds, and to choose competitive bidding over negotiated sales. Narrowing victory margins by one quintile increases the probability of debt being issued as a revenue bond by 4.2%, while an increase in the number of partisan swings in the past electoral races by one standard deviation leads to an increased probability of 8.2%. Likewise, narrowing of victory margins by one quintile increases the probability of issuing bonds through competitive bids by 2.5%, and an increase in the number of partisan swings in the past electoral races by one standard deviation increases the probability by 2.3%. These results are more salient given that a large part of the municipal budget is fixed and tight to particular sources of financing, and only around 20% is subject to policymakers' discretion. Moreover, the point estimates are higher for elected mayors than for city managers, and closer to the next elections. This relationship can help explain trends in public financing and spending. The choice of revenue bonds and competitive bidding insulates public officials from referendum checks and allegations of impropriety, but require higher interest rates and administrative costs.

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1 Introduction

Cities, counties, and states issue municipal bonds to raise money for public projects, including new construction for education, water and sewage, and transportation.[1] Securing funds for these projects could benefit politicians who are up for reelection. While municipal bonds are a small part of overall state expenditures, these securities comprise a third of spending on capital projects and a substantial fraction of the overall American securities market. In 2017, the municipal bond market accounted for $4 trillion, roughly 10% of the American public debt. Is the choice of municipal financing instruments and sales mechanisms driven solely by efficiency factors?

Recent cases of spectacular defaults—e.g., in Detroit[2] and Puerto Rico[3]—have put municipal bonds in the spotlight. Large capital projects like sports stadiums are commonly funded by bonds and are favored for their political popularity based on estimated economic development impact. In Albuquerque, revenue bonds are being used to finance sports fields, a new bus system, library, and visitor center. Mayor Richard Berry argues that the capital projects are necessary to stimulate the economy, which plays well in elections. By using a revenue bond, city commissioners compete for the pot of money to benefit their districts and avoid a referendum.[4]

The best practices for issuing municipal bonds recommend that the end goal of any bond should be to provide funding at the lowest cost to the public. Choosing some riskier characteristics within bonds may cause higher interest rates or come with higher fees. As long as choices between characteristics are based on accounting factors, officials and citizens have little cause for concern. Officials (mayors, city managers, and governors) that have an

[1] See: National Association of State Budget Officers, "State Expenditure Report 2014-2016," available at: https://higherlogicdownload.s3.amazonaws.com/NASBO/9d2d2db1-c943-4f1b-b750-0fca152d64c2/UploadedImages/SER%20Archive/State%20Expenditure%20Report%20(Fiscal%202014-2016)%20-%20S.pdf (accessed April 3, 2017).

[2] See: "Detroit leads 2013 U.S. bond defaults: Moody's," *Reuters' Business News*, May 7, 2014, available at: http://www.reuters.com/article/us-usa-municipals-defaults-idUSBREA4603920140507 (accessed June 28, 2017).

[3] See: "Puerto Rico starts $70 billion bankruptcy proceeding, biggest ever for municipal bond market" by Dawn Giel, *CNBC*, May 3, 2017, accessible at: http://www.cnbc.com/2017/05/03/puerto-rico-officially-triggers-bankruptcy-protection-proceedings-.html (accessed June 28, 2017).

[4] See: "Revenue bonds allow ABQ leaders to bypass voters," by Dan McKay, *Albuquerque Journal*, January 2, 2017, available at: https://www.abqjournal.com/919263/revenue-bonds-find-favor-in-abq.html (accessed April 7, 2017).

imminent risk of losing reelection may heavily consider the public perception of bonds and choose characteristics that are favorable for reelection. The result is that more expensive and procedural bonds and sales mechanisms are chosen to curtail the hazards from political opponents.

At the risk of oversimplification, municipal bonds can be categorized in two main types: general obligation (G.O.) bonds and revenue bonds.[5] These two types of bonds have different contractual characteristics. G.O. pledge to all forms of city finances (including general tax revenues) and their proceeds can be used at the discretion of the elected official. G.O. bond issues must be approved in referenda and, in most jurisdictions, are subject to legislated debt limits (Rugh and Trounstine 2011).

In contrast, revenue bond proceeds are earmarked for specific purposes and are backed by specific revenue streams, normally from the investment project they finance. Revenue bond issues do not require approval in referenda (Rugh and Trounstine 2011) and are excluded from debt ceiling calculations. Due to their restricted collateral, however, revenue bonds are more expensive (must pay higher interest rate) than comparable G.O. bonds (Edwards 2008). Therefore, tradeoffs emerge between disbursement discretion, financial cost, and political oversight (see Table 1 for a typology of the main classes of municipal bonds). For example, by selecting revenue bond financing and accepting the cost of higher bond yields, a politician can self-restrict the scope of her discretion to avoid public scrutiny through a contested referendum and insulate herself from a charge of improper use of public monies. This was the case in Rhode Island in November 2015, when Gov. Gina Raimondo proposed to finance road improvements with revenue bonds. According to Rhode Island Department of Transportation (RIDOT), choosing a revenue bond was more costly—with a projected 5% interest rate for the toll-backed revenue bond, compared to an average rate of 2.4% on a G.O. bond the state proposed earlier that year.[6] From the Raimondo administration's perspective, there were multiple benefits to the revenue bond: the governor could argue taxpayer money would never be used to pay the bond and—unlike with a G.O. bond—no referendum was required to approve the borrowing. RIDOT Deputy Director Peter Garino said revenue bonds provide

[5] In corporate finance, these instruments correspond to corporate debt and project finance debt. We further develop the institutional setting of municipal bonds in section 2.2 and Appendix B.

[6] Cf. http://www.ri.gov/press/view/25386 (accessed March 10, 2016).

"a safeguard to prevent future governors or lawmakers from redirecting toll revenue to other types of spending."[7]

Likewise, in October 2016 third parties critical of Project Jackson—a mixed-use development featuring a minor league baseball stadium, restaurants, retail and multi-family residential units—in North Augusta, SC, were questioning why the financing model of the development was not placed on a referendum for a public vote. Most notably, the city was using revenue bonds instead of G.O. bonds as the chief lending mechanism. What is the difference? Revenue bonds do not require a public vote, while G.O. bonds—which carry a lower interest rate—require a public vote because they pledge to general tax revenues. The commissioners were afraid that if citizens had to vote on the G.O. bonds, they would likely reject them.[8] Similar stories are not unfamiliar to local politics.

Table 1: This table provides a typology of the main classes of municipal bonds.

Bond type	**Backing**	**Spending**	**Subject to debt limits**	**Referendum required**
General Obligation	All revenue sources (general taxes)	Discretionary	Yes	Yes
Revenue	Invested project revenue or another specific source	Earmarked	No	No

In terms of sales methods, municipal bonds can be placed via competitive bidding or negotiated sales. The sales method of municipal bonds does not make it to the local front news, but is also subject to administrative discretion. Under negotiated sales, an underwriter is selected to purchase the municipal bonds and the terms are tailored to meet the her demands. On the other hand, competitive sales are analogous to open auctions, i.e., the bond is simply awarded to the bidder offering the lowest interest cost, but are more costly in the informational disclosure and administrative processing (see Table 2 for a typology of

[7] See: Ted Nesi, "Here's why RIDOT says a truck-toll bond would save RI US$612M—Transportation agency explains rationale for borrowing US$600M to repair bridges," *WPRI 12 Eyewitness News*, November 2, 2015, http://wpri.com/2015/11/02/heres-why-ridot-officials-say-a-truck-toll-bond-would-save-ri-612m/ (accessed March 10, 2016).

[8] See: Michael Smith, "Project Jackson bonds have higher interest rate," *Aiken Standard*, October 17, 2016, http://www.aikenstandard.com/news/project-jackson/project-jackson-bonds-have-higher-interest-rate/article_396b949c-94c6-11e6-a418-c3e8dbc4b021.html (accessed December 11, 2016).

underwriting mechanisms of municipal bonds). For example, Oklahoma has recently provided examples of how these different types of bond issuance can lead to significantly different costs. In one case, a district issued a $72.62 million bond through negotiation that had $871,000 (i.e., 1.2%) in underwriter discount.[9] Meanwhile another district issued a $310.48 million bond through competitive process and paid $247,000 (i.e., less than 0.1%) in service fees.[10]

Table 2: This table provides a typology of underwriting mechanisms of municipal bonds.

Type of underwriting	**Number of underwriters**	**Terms**	**Information disclosure**
Competitive bid	1+	Determined when bid is submitted, chosen by issuer	All bidders must have information before constructing an offer
Negotiated	1	Negotiated before sale date of bond	Information disclosed only between negotiating parties

We analyze municipal bonds as a type of long-term public (debt) contract entered into by an elected official. A combined treatment of municipal finance and political governance is herein proposed. We argue that revenue bonds and competitive sales are more rule-based than G.O. bonds and negotiated sales, correspondingly. The relative cost differences may look *prima facie* modest. If 10% of the bonds are *misallocated*, however, a 1% difference in paid interest and fees would account for $4 billion additional costs to taxpayers.

Research suggests that financial needs and risk allocation are the main factors influencing the choice of municipal bond type (Kidwell and Koc 1982; Ingram, Brooks, and Copeland 1983). We offer empirical evidence for a complementary explanation pointing to electoral considerations in choosing financial instruments. We draw on Moszoro and Spiller (2012) about the threats imposed by third parties and political opponents on public officials, and hypothesize on several reasons why elected officials may select revenue bonds and competitive sales when elections are tight. First, by choosing rule-based methods—revenue bonds and competitive sales—city officials signal "probity" (i.e., transparency and trustworthiness to

[9] "Underwriter discount" refers to the underwriter's compensation, similar to "service fees."

[10] Randy Ellis, "Oklahoma schools accused of squandering millions on bond fees," NewsOK.com, November 1, 2016, accessed April 03, 2017, http://newsok.com/article/5524536.

deliver a project) and limit concerns about the discretionary use of public monies to enrich themselves and buy political favors (Benson and Baden 1985).

Second, earmarked proceeds limit the discretion of a successful challenger in the event that the incumbent loses the next election. For example, consider a city where the incumbent's constituents care about roads while the challenger's constituents care about schools. If the incumbent's winning margin is close (so the mayor's seat is more contestable), she will issue revenue bonds to lower the challenger's discretion to use funds for, say, schools *ex post*.[11]

Third, unsecured G.O. bonds and competitive sales require more information disclosure to lenders on municipal financials than secured and negotiated debt (Myers and Majluf 1984), which a public agent in a politically contested position may be less willing to provide.

Fourth, by choosing revenue bonds, politicians dodge compromising referenda[12] and may also avoid legislated debt ceilings.

This article proceeds as follows. We begin this topic with a discussion of the theoretical literature. We then describe the model as well as the institutional setting in which we will test it. A description of the data and the results of this estimation exercise follow. Finally, we provide some concluding remarks.

2 Conceptual Framework

2.1 Relevant Literature and Proposed Contribution

This study relates to two streams of research on contracts. One common view in economic literature is that in the context of contracts for goods and services, competition (auctions) gives firms strong incentives to be efficient and reveal their private costs relative to negotiations (Bulow and Klemperer 1996). Moreover, because open auctions are a transparent sale procedure, they are considered less vulnerable to both corruption and favoritism. This explains why competitive auctions are often used to award large contracts in public procurement. Recent work suggests, however, that the trade-off between auctions and negotiations

[11] Analogously to a selective debt overhang effect (Myers 1977).

[12] In theory, analogously to a financial option holder who seeks higher volatility (Black and Scholes 1973), a contested politician may take the risk of a narrow referendum vote hoping for the upside: winning the referendum and getting political momentum. In practice, however, it is seldom the case of politicians calling for referenda (or "motion of confidence" in the case of European parliaments) when they are politically weak.

in procurement may be more accurately determined by the complexity of the project. When dealing with complex projects, buyers may have difficulties specifying all possible contingencies. Thus incomplete contracts may give rise to costly *ex post* adaptations (Bajari and Tadelis 2001). This line of research suggests that simple projects should have detailed designs and be procured using fixed-price (competitive) contracts. Complex projects, on the other hand, are better managed by investing less in project design while using cost-plus contracts to facilitate easier negotiations. Recent empirical work supports to this hypothesis (Bajari, Houghton, and Tadelis 2014).

Another substantial body of literature on government officials' contractual discretion has focused on public accountability of officials. Contracting "rigidities" here are formal processes put in place to insure against governmental opportunism. "Red tape" regulations are designed to reduce public employees' ability to take actions that are potentially at odds with the general public's interest (Kurland and Egan 1999). In other words, such regulations are bureaucratic instruments that restrict public officials' discretion (Prendergast 2003).

These studies are part of the literature exploring the determinants of contract form (e.g., fixed-price versus cost-plus) on the basis of economic efficiency considerations. There has, however, been less focus on how political factors influence elected officials and features of public policy in general and public contracts in particular.

Laffont and Tirole (1993) suggest that the connection "between procurement and regulation and the associated administrative and political constraints is still unknown to us or is still in a state of conjecture ... [I]nstitutions are endogenous and should as much as possible be explained." To fill this gap, Spiller (2008) and Moszoro and Spiller (2012, 2014) have recently proposed a complementary rationale for unique features of public contracts in the presence of competitive political markets (multiple competing political parties). They argue that the choice of contract by an official is also likely to be influenced by her perceived political hazards, such as challengers for her office.

In Moszoro and Spiller's (2012) approach, there are four players involved in a public contract: the incumbent political agent, the private contractor who can provide the public good or service, the potential political opponent, and the voting public. The public is implicated in any transaction between the politician and the private contractor because contracts use

public monies and affect social welfare. A political challenger can be involved for similar reasons, as well as an intrinsic motivation to be elected to office. When competing for office, an opponent can mobilize the public to scrutinize an incumbent public official's decisions. Such scrutiny has the potential to reveal corruption, favoritism, or other improprieties in public contracting. This public auditing of politicians is a challenge to what Williamson (1999) calls the "probity" of the public official. Public auditing induced by political challengers may discredit the official in power, and at the very least, can lead her to incur expenses to defend her actions. In extreme cases, incumbents may be vulnerable to losing office.

Thus, the "political contestability" framework of Moszoro and Spiller (2012) leads to the prediction that in political environments where elections are heavily contested, politicians will make procurement decisions to avoid the whiff of corruption and misuse of public funds and thus deter successful political challengers. Using this recently developed theoretical framework, we contribute to the literature on features of public contracts by empirically examining how city-level debt contracts correlate to political competition and its accompanying public auditing, or "third-party opportunism." We use municipal bond issuances as a contractual setting in which we can test this hypothesis.

2.2 Institutional Setting: U.S. Municipal Finance

Municipal bonds are generally used to finance public infrastructure needs such as roads, schools, power and water facilities, hospitals, public housing, etc. The U.S. municipal bond market is a large component of domestic public finance, with the total outstanding debt reaching an all-time high of 22% of U.S. GDP in 2010.

There are two basic types of bonds issued by municipalities: general obligation (G.O.) and revenue bonds. These two types differ in the source of revenue for future bond repayment and the use of funding. General obligation debt instruments commit the full faith and credit of the issuing local government to repay debt obligations from any available revenue stream. In other words, for G.O. bonds, general tax revenues can be used to pay the bonds.[13] Because

[13] Contrary to the common presumption, G.O. bonds may be supported by a pledge of the issuer's full faith and credit *and/or* the issuer's taxing power. For example, G.O. bonds of California local governments are supported by a pledge of their taxing power, but not by their full faith and credit. In contrast, G.O. warrants of Alabama local governments are not supported by a pledge of their taxing power (National Association of Bond Lawyers 2014).

they pledge to any municipal financial resource, their issuance is conditioned on referendum approval—in some states with a qualified majority (Edwards 2008)—which increases the politician's exposure to public scrutiny.

Revenue-backed debt, on the other hand, is supported by dedicated project fees or other explicitly allocated sources of revenue. Debt from revenue bonds is thus guaranteed to be repaid only through the net operating revenues (operating and maintenance costs subtracted from annual completed project revenues) of the public project. Revenue-backed bonds may include projects such as port authorities, toll roads and bridges, and parking garages. Revenue-back debt is not taken into account in debt ceilings; it is, however, riskier to the lender and thus more expensive to the issuer in terms of financial servicing.

Given these differences in how funds can be used and how debt must be serviced, the two debt instruments impose different constraints on public officials. Debt through G.O. bonds gives cities flexibility in how municipal funds are used to fund government projects and how debt is later repaid. Revenue bonds, on the other hand, constrain public officials' use of project funds and revenues.

In principle, the nature of the project to be financed should determine the type of debt to be utilized. Revenue bonds are typically used in public enterprises that later generate revenue through service charges or user fees. By contrast, G.O. bonds were initially used for projects that generate less revenue, such as roads, government office buildings, and schools. In practice, however, general obligation debt can be, and often is, used for revenue-generating projects because of its cost advantages (i.e., lower transaction costs) over revenue bonds (Vogt 2004).[14] Revenue bonds often require additional components not found in general obligation debt instruments, such as conducting a feasibility study, as well as covenants and indentures to protect investors (Howell-Moroney and Hall 2011). These elements add significant costs to municipalities that are already resource-constrained.[15]

[14] Revenue bonds are not more costly in the Modigliani-Miller sense (Modigliani and Miller 1958), because bondholders price in different risks. For the taxpayers, however, a revenue bond can be more expensive if the politician is "insuring" her own political capital.

[15] The choice between general obligation bonds and revenue bonds is analogous to corporate versus project financing (Esty 2003; Yescombe 2013). In corporate finance, projects are financed from a pool of resources, and debt is serviced from corporate cash flows. When a corporation undertakes an investment project, cash flows from existing activities to fund this project. The firm has the option to roll over the project's capital into newer ventures within the company without submitting decisions to the discipline of the capital market. Lenders have recourse to the assets of the corporation. Conversely, in project finance, debt is served only from

In sum, revenue bonds and competitive bidding impose rigidities on public officials' procurement, use, and service of public funds relative to general obligation debt and negotiated sales. Thus, we propose that revenue bonds and competitive bidding can be conceptualized as rigid features of debt contracting.

3 A Model of Contractual Rigidity Applied to Public Debt

3.1 Model Description

Moszoro and Spiller (2012) develop a model to account for the role of political risk faced by politicians in contracting as discussed in section 2. This model suggests that the lack of flexibility in public procurement is a deliberate part of contract design that reflects an elected official's political risk adaptation to limit hazards from opportunistic political opponents. We now present some key results (adapted for our context) to motivate our empirical test.

Public officials' choices regarding contract features will be influenced in part by the need to prevent public suspicion of favoritism or corruption that may be associated with flexible/discretionary contracts. Contract rigidity thus serves to insulate public officials from allegations of impropriety in heavily contested political markets. In the context of local public finance, a revenue bond is a more specific and rigid financial contract than a general obligation bond since G.O. bonds are secured by a city's ability to use all legally available resources, such as tax revenues, to repay bondholders.

Contracting costs rise exponentially with contract specificity and rigidity, and help determine the trade-off between mayoral flexibility in using city finances and the cost of contract writing (Schwartz and Watson 2012). In the Moszoro-Spiller model, elected officials minimize both bond issuance costs and political costs. As described in section 2.2, G.O. bonds represent low-rigidity instruments, and revenue bonds are high-rigidity instruments. The more rules are attached to a bond, the more costly it will be to a public official, and both the likelihood of a challenge by a political opponent (in the language of Spiller (2008) and Moszoro and Spiller (2014), an "opportunistic third party") and the likelihood of success of

the cash flows generated by the financed asset, typically through a special purpose vehicle (SPV), and the lenders have no (or limited) recourse to the shareholders. Consequently, corporate financing is a more flexible and cheaper form of financing.

an opportunistic challenge decrease in bond rigidity. These assumptions suggest that when contract terms leave more discretion to the public official, there is more room for outsiders to challenge the official. Therefore, the cost to a political challenger increases with the rigidity of the contract.

Potential challengers to a public official know their prospective benefits from challenging an incumbent. However, the elected official does not know *ex ante* the particular value of these benefits for the third parties. The ability of opportunistic political opponents to challenge public officials will depend on the political environment in which officials make contracting decisions. Opportunistic challenges of public contracts require "political contestability" of elected officials or a fragmentation of the market for politicians (Spiller 2013). In other words, there must be a certain level of competition between opposing parties: "centralized party power limits the upward mobility of political mavericks, and thus the potential for internal third party opportunists."

Moszoro and Spiller (2012) show that, in equilibrium, political opportunists challenge a contract (and perhaps more directly, the incumbent official) only if the expected gains are bigger than the challenging costs. These costs may include campaigning to raise public awareness, lobbying, and reputational costs borne by the challenger. If a challenger's benefits are symmetrical to the incumbent's political costs (e.g., a bipartisan political market); if the political market is fragmented and the challenger does not internalize all benefits from a successful protest.

When the public official follows rules, it is more costly to challenge her of wrongdoing. Reduced flexibility by earmarked financing and rigid bond servicing limits the likelihood of an opportunistic challenge lowering third parties' expected gains (increasing the costs of a challenge). Any deviation from equilibrium rigidity makes the elected official worse off:

(a) If rigidity is lower than the optimal level, the increased political cost offsets any decreases in bond issuance cost

(b) If rigidity is higher than the optimal level, the increased cost of issuing rule-based debt outweighs the decrease in political cost

3.2 Hypotheses: Bond Features under Political Contestability

We argue that whether municipal projects are financed by revenue bonds or G.O. bonds and whether bonds are issued through competitive bidding or negotiated sales depend not only on the characteristics of the assets, but also on the political hazards of the incumbent public agent. When political costs are factored in, the use of revenue bonds and competitive bidding (i.e., rules) is preferred to finance public interest assets, while G.O. bonds and negotiated sales are used to finance projects that require flexibility, but do not damage the idiosyncratic political capital of the incumbent politician.

Moszoro and Spiller's (2012) model suggests that elected officials will respond to greater political risk with higher contractual rigidity to lower the likelihood of a successful challenge. Forming contracts with more rule-based terms signals to constituents transparency and integrity. We have thus empirically testable hypotheses on how the design of municipal bond issues depends on the political environment. In cities where public officials face a high level of political contestability (where candidates face viable competitors who can mobilize public scrutiny of their decisions or, alternatively, high ζ), revenue bonds and competitive bidding will be chosen more often than in non-contestable municipalities (low ζ). When political opposition is weak (lower ζ), the incumbent will not insulate herself from political challenges through contractual rigidities. In the extreme, a very low ζ environment resembles a single-party system.

Thus, we test the following hypotheses:

Hypothesis 1 *Elected officials are more likely to issue revenue bonds in politically contested municipalities.*

Hypothesis 2 *Elected officials are more likely to issue bonds through competitive bidding in politically contested municipalities.*

Furthermore, if political risk affects elected officials' contract choices, then the time at which the bonds are issued is implicated. In particular, officials may engage in strategic timing in issuing different bond types, choosing more restrictive bonds to signal transparency and integrity closer to an election (i.e., in years 3 and 4 of a typical four-year political cycle).

Hypothesis 3 *Elected officials are more likely to issue revenue bonds in politically contested municipalities closer to the next elections, i.e., later in a mayoral term.*

We proxy political contestability—i.e., the political competitiveness of the jurisdiction and likelihood of the incumbent public agent to lose office—by outcomes of city general elections for mayor. We now discuss how we construct these measures, as well as our identification strategy.

4 Data and Empirical Methodology

4.1 Data Description

To carry out this study, we construct a national dataset with information on municipal debt issuances, mayoral elections, as well as economic and demographic characteristics for U.S. cities and towns. In this section, we describe the dataset used in our empirical analysis.

We are interested in analyzing how political risk affects public officials' contracting using characteristics of municipal bonds as a measure of contractual rigidity. To this end, we first create a comprehensive database of municipal bond information using information on public bonds from Bloomberg Financial LP. We gather data for all municipal issues between 1980 and 2002. Each city-issuance observation contains several pieces of information, including the specific issuer (including city or the affiliated municipal agency),[16] the date of issue, the coupon type (fixed, zero coupon, etc.), the size of the project for which the bond is issued, the commercial grade of the bond, the industry in which the project requiring financing is being undertaken, the sale method for the security (i.e., whether the issuance was negotiated or competitively bid for),[17] and most importantly for our purposes, the bond type—G.O. or revenue bond—and sale method—negotiated sale or competitive bidding.

The mayoral election data used in this paper is based on a sample of cities described in Ferreira and Gyourko (2009). The city-level information is based on a survey of all cities in the United States with more than 25,000 inhabitants as of the year 2000. Information was

[16] Less than 25% of the bonds in our dataset come from cities and counties; the remaining are issued by special agencies: e.g., school districts, financing and housing authorities, city corporations, development commissions, etc. These affiliated municipal agencies enjoy limited autonomy as their managers are appointed by elected politicians to whom they report.

[17] A sale of public debt allocated by a competitive bid mechanism is one in which buyers compete by offering lower interest rates.

requested on the timing of all mayoral elections since 1950, the name of the elected mayor and the runner-up candidate, vote totals for each candidate (and aggregate vote totals), partisan affiliation, the type of election (i.e., partisan or non-partisan), as well as other information related to specific political events such as runoff elections or special elections. We start with data for more than 5,500 elections held in 575 cities between 1950 and 2005. Importantly, Ferreira and Gyourko (2009) suggest that the data are representative of cities nationwide across many observable dimensions (although the municipalities in the sample are larger than the average municipality).

We are able to collect data on 38,904 different municipal debt offerings made by US municipalities between 1980 and 2002. Not all of the debt-issuing cities over this period are contained in the sample for which we have election data. Using a computerized "fuzzy match," we are able to match the bonds sold for 416 of the 575 cities for which we have political data. In total, we are able to match 6,505 of the bonds for which we have data to election and controls data.

As other studies point out (Gao and Qi 2012; Pollan 2014; National Association of Bond Lawyers 2014), there are confounding factors that may affect a mayor's choice of flexible or rigid funding choices. We thus control for several local-level attributes. Using data from the U.S. Census Bureau, we account for the size of a municipality using population and population density. Additionally, we control for a city's overall economic conditions using both real income per capita and the unemployment rate from the U.S. Bureau of Economic Analysis. We were able to obtain this information standardized at the county level, which is highly correlated to city-level traits, and hence would serve our purposes well for this empirical exercise. Finally, we control for a city's financial stability and the riskiness of projects undertaken using bond-ratings data from Moody's and Standard & Poor's (S&P).[18]

[18] For example, Moody's reviews the following factors in its credit rating process (Moody's 2007):

1. Economic Strength (40%)
   (a) Size and growth of the tax base of the municipality
   (b) Socioeconomic and demographic profile of the municipality
   (c) Industry makeup of the municipality: sector concentrations, stability of those sectors
   (d) Populations trends, poverty levels, income
   (e) Unemployment rate
2. Financial Strength (30%)
   (a) Financial stability of industries within the municipality throughout the business cycle
   (b) Liquidity of municipal assets

We converted the bond ratings into cardinal codes as in Anderson, Mansi, and Reeb (2003). The ratings conversion codes are in table 3. We then averaged the conversion numbers for each municipality, year, and type of bond. Since not all bonds are rated (1,663 missing values), we engineered a two-step protocol to fill missing values. First, if there were credit ratings available in the same municipality in that year, we applied the mean credit rating of that year for the missing rating. Second, if there was no credit rating available for a particular year (or years), we interpolated the missing values by year. The procedure allowed to add 1,050 synthetic credit ratings.

After collecting all the data, we link the municipal bond data to city election outcomes.

4.2 Empirical Strategy

Our goal is to understand whether a public official's exposure to political competition and political risk affects the type of debt instruments and method of sale that she uses. To test for causality between political risk and bond type/sale method, an exogenous shock to political risk (e.g., unanticipated legislative changes to G.O. bond holders' rights or electoral prospects of incumbents politicians differently) would be required. Our data, however, does not allow for the exploitation of such variation. Thus, all results presented here are correlational.

Elections typically occur every two or four years, so there are many more municipal-year observations in our bond data than in the elections data. Therefore, we adopt two strategies to analyze the correlation between political contestability and bond type. First, we use a linear probability model and the bond-level data to measure if political contestability,PC, is predictive of type of individual bonds. We regress a dummy variable (revenue bond = 1) on various measures of political risk and control variables. Second, we aggregate bond data by both year and election cycles. Both of these approaches allow us to assign all bonds within

(c) Sensitivity of municipal revenue sources to changes in the economy, property taxes and reductions in state and federal funding

3. Management and Governance (20%)
   (a) Debt management and budgeting practices of municipality
   (b) Multi-year planning of municipalities
4. Debt Profile (10%)
   (a) Net existing debt amounts
   (b) Debt as a percentage of revenue
   (c) Municipal pension plan funding ratio

a mayor's term to that mayor.

The basic linear probability specification for the first strategy is as follow:

$$Bond\ Type_{i,m,t} = \alpha_0 + \beta_1 PC_{i,t} + \gamma X_{i,m,t} + \varepsilon_{i,m,t} \tag{1}$$

where i is the bond index, t is the year of issue, and m is the municipality of issue. PC_m is our political contestability measure that describes the extent to which the mayor presiding over the municipal bond issue is subjected to the risk of opportunistic challengers. The regressions for the sale method follow the same specification, with a dummy variable equal to one for bonds sold in a competitive bidding.

To estimate the coefficient on PC_m we use two main sets of political risk measures adopted from Moszoro, Spiller, and Stolorz (2016), who analyze how the political risks faced by governors affect procurement contract rigidity as proxied by length and contractual features. We measure both the closeness of individual mayoral races as well as the degree to which the political party in control of the mayor's seat changes over time (i.e., the frequency of "partisan swings").

We define *margin* as the difference in a mayoral election between vote shares obtained by the winning party candidate and the runner-up:

$$Margin_{m,t} = W_{m,t} - RU_{m,t} \tag{2}$$

where $W_{m,t}$ and $RU_{m,t}$ are the winning and runner-up parties' vote share in municipality m in the last electoral race before time t. A large margin of victory indicates a less competitive political market. In our framework, if a mayor is elected by a slim vote margin (and hence faces a highly competitive political market and credible political challenges), she will enjoy less flexibility in issuing unconstrained municipal debt. To prevent future political challenges, she will engage in more transparent contracts to signal probity to voters. In the context of municipal finance, we expect that in cities with large victory margins, mayors will be less likely to issue revenue bonds, as the mayor cannot control the use of funds or the method of debt servicing.

We create two variants of *margin*. We use *margin quintiles* to correct for the abnormal distribution of *margin*. Margin quintiles correspond to the "ranking" of political contesta-

bility.[19] In the second variant—*large margin*—λ is an *a priori* threshold for a given level of "high" political contestability:

$$Large\ margin_{m,t} = \begin{cases} 1 & \text{if} \quad |W_{m,t} - RU_{m,t}| > \lambda \\ 0 & \text{if} \quad \text{else} \end{cases} \tag{3}$$

A 10 percentage point or greater lead in presidential or congress election races—where voter participation is relatively high and constituencies more stable—is considered a safe winning margin (which corresponds to a larger than 5 percentage point voter flip needed to change the election outcome). Municipal election races, on the other hand, are characterized by lower voter participation, and thus are subject to more vote outcome volatility. Also, most states require a qualified majority of two-thirds approval in municipal referenda for issuing G.O. bonds. To account for these factors, a 20-percentage point polling lead is considered a safe winning margin for local races in the U.S. We use $\lambda = 20$ percentage points.

Our second measure of the political contestability faced by elected officials is the degree to which the mayor's seat changes party hands over time, also adopted from Moszoro, Spiller, and Stolorz (2016). We denote this risk measure *partisan swings* defined as:

$$Partisan\ swings_{m,t} = \sum_{t=-2}^{0} Party\ Change_{m,t} \tag{4}$$

where *Party Change* is a dummy variable equaling one if a mayor's seat changes party hands in municipality m at time t. I.e., *partisan swings* captures the number of party changes in the previous three electoral races.

These three basic proxies of political risk faced by a mayor are used in Equation (1) for *PC*. The coefficient of interest is then β_1. We also control for several factors that may also explain the choice of G.O. or revenue bonds. We account for project complexity using the size of the deal and industry (transportation, housing, schools, etc.) fixed effects. We control for economic conditions using per capita income and size by city population. We also control for municipality and time fixed effects to account for unobserved fixed regional effects or time-specific effects. Finally, we control for the riskiness of projects and city finance by controlling for a city's average bond rating (Rubinfeld 1973). In future work, we hope to also control for municipality indebtedness to tax revenue.

[19] Our *margin quintiles* vary in range, with their width increasing in the upper quintiles. We also run the regressions using fixed 20 percentage points margin bins instead of quintiles and obtained similar results.

In addition to our binary choice regressions, we aggregate the bond data to the city-year level, and perform similar estimations to the above. We then re-test hypothesis (1) by estimating OLS regressions of the share of revenue bonds of total bond issues (both by year and cycle) on our measures of political contestability:

$$\left[\frac{RB}{GO+RB}\right]_{m,t} = \alpha_0 + \beta_1 PC_{m,t} + \gamma Controls_{m,t} + \varepsilon_{m,t} \tag{5}$$

where m is the municipality index. The coefficient of interest β_1 indicates the significance of political risk to city officials when choosing the proportion of overall debt that will be issued as the more rigid form of debt. PC_m are the same political contestability instrumental variables in municipality i, as described above. RB is the total value of all revenue bonds issued in city m, while GO is the total value of all general obligation bonds issued. We use the same set of controls, except that bond-level attributes now are a deal-weighted average.

5 Results

5.1 Descriptive Statistics

Before moving to the main analysis, we discuss some basic features of the city-level data, which is summarized in table 4. Panel A suggests that we are able to analyze a broad range of municipalities. In our dataset, there are 416 cities across 45 states in our dataset, with a range of demographic and economic characteristics. The cities range from very urban (around 32,000 residents per square mile) to quite rural (10 residents per square mile). There is also variation in size—the average county population (which we use as a proxy for city population) is 1.5 million, but the range of the population distribution is over 9.5 million. The cities vary in economic conditions as well. Average unemployment over the sample ranges between 2 and 13% over our sample period. Some cities are wealthier than others, as judged by median per capita income. The average municipal median income is US$ 9,043.

There is also heterogeneity within the city-level election data (see table 4, panel B). There is a relatively even distribution of elections in which Democratic candidates win (39%) and Republicans win (32%). The average margin of victory for a winning mayoral candidate is 39%. This large margin, however, can be attributed to the fact that several elections in our dataset are uncontested (one candidate who wins by default). When these uncontested elections are excluded, the average margin decreases substantially to 20%. Importantly, however,

taking victory margin as a measure of competitiveness, the political races vary substantially between very competitive (suggesting high political contestability) and noncompetitive (not contestable environments for political challengers).

General obligation bonds and revenue bonds account for 27.55% and 52.19%, respectively, of our observations (see table 4, panel C). Other types of bonds issued by municipalities are: Certificate of Participation (3.84% of observations), G.O. Limited Bonds (2.11%), Notes (0.02%), and Special Assessment (3.07%), Special Tax (2.60%), and Tax Allocation (3.62%) bonds.

Because G.O. and revenue bonds are by far the main types of bonds in our sample, we collapse these categories into a dichotomous "G.O. or revenue bond" categorization. On average, municipal bonds are issued for deals worth approximately US$ 86 million. According to the summary statistics, public bonds are issued for a variety of projects. In our sample, bonds are issued most commonly to finance education projects (i.e., building schools, universities, etc.). Interestingly, the majority of the bonds in our sample are issued via a sale mechanism. Only 17% are issued via a competitive bid process (bonds are awarded to the bidder offering the lowest interest cost). The average bond rating across two indices is between AA and A+ according to S&P (Aa3 and A1 for Moody's). Bond ratings are concentrated at the higher end of the ratings scale.

5.2 Security Type: G.O. versus Revenue Bonds

We start by estimating Equation (1) using a linear probability model and a logit model for robustness. Table 5 provides estimates from the sparse baseline specification, separately using the three different measures of political contestability and few city control variables. We control only for the size of the municipal offering (log-transformed deal size) and the riskiness of the city's finances (the average bond rating). All regressions were estimated using heteroskedasticity-robust standard errors.

The results provide evidence that political risk influences a city's selection of bond type. The main variable of interest is PC_m, which is some variant of either *margin* or *swings* as defined in Equations (2) through (4). As shown in model 1 of table 5, the margin of victory in a mayoral election is negatively correlated to the likelihood of issuing debt as a municipal bond rather than a G.O. bond. The negative sign on the coefficient is as expected, since an increase

in the margin of victory suggests a less competitive political market. This less competitive institutional environment raises the likelihood that a public official will issue the more flexible form of debt contract. The coefficient is economically and statistically significant, suggesting that an increase in the margin of victory by quintile lowers the probability of issuing a bond as revenue-backed debt by 1.9%.

The sign on the *large margin* is negative and significant. The larger magnitude is as expected, since our theoretical framework suggests that if a mayor's margin of victory is arbitrarily large (in our case, a difference in winner and runner-up vote shares larger than 20%), the likelihood of issuing a revenue bond should be relatively low. The coefficient on *large margin* is indeed negative and larger than the coefficient on *margin*; large margins of victory are associated with 4.5% decrease in the probability of issuing revenue bonds.

The results in model 3, in which our measure of political contestability is the number of partisan swings in the previous three elections, further suggest that political risk is a factor in public debt type issuance. One change of a mayoral political party in recent election cycles increases the likelihood of issuing revenue-backed debt over general obligation debt by 11.2%. We also conducted the same regressions using logit specifications (models 4–6) to validate our linear probability models; the results are qualitatively similar.

Table 5 provides further evidence as to how political factors may affect public officials' contracting decisions. In particular, when testing Hypothesis 3 it appears that the year within a mayor's political cycle may be meaningfully correlated with the likelihood of issuing a revenue bond. In particular, holding other factors constant, the issuance of debt as a revenue bond is most likely in the third and fourth years of an election cycle, ranging between 5.2 and 9.4%. One possible explanation for this is that in the early years of a mayor's term she feels less of a need to insulate herself from allegations of impropriety. Thus, issuing more flexible debt is less risky at the beginning of a mayor's term. In the third year, however, as a mayor is beginning to prepare for a potential reelection campaign, she issues the more rigid form of municipal debt to maintain the appearance of probity. The same can be said for the fourth year, although perhaps by this point, a mayor's image is crystallized in the minds of voters.

In sum, our baseline estimates suggest that political contestability is a meaningful determinant of whether a municipal bond is issued as a revenue bond. The results are consistent

with the hypothesis that in cities with a high degree of political competition, as approximated by low margins and more shifts in political power over time, one is less likely to observe the issuance of more flexible G.O. bonds.

In table 6, we adopt city-specific and bond-specific controls in the spirit of Gao and Qi (2012). We also include state and year-fixed effects to control for either time-invariant state conditions and laws, or nationwide shocks that may affect the selection of bond features.

We again begin with margin-of-election win as our measure of political contestability. An increase by a quintile in *margin* is associated with a 4.2% decrease in the likelihood of issuing a revenue bond. The point estimate for *large margin* is significant: a victory above 20 percentage points in the mayoral race is correlated with a 8.4% decrease in likelihood of an issuance being a revenue bond. The estimate in model 3 using *party swings* as the independent variable of interest is also qualitatively similar: more party swings are correlated with a 18.2% increase in the likelihood of issuing revenue bonds. The results are consistent with the hypothesis that in districts where the party in power is historically susceptible to change (suggestive of more evenly distributed political power and more political competition), mayors are more likely to insulate themselves from opportunistic challengers by issuing securities as revenue bonds.

In models 6–8, we include industry fixed effects. The point estimates on the effects of political competition on the probability of issuing revenue bonds decrease by approximately one third, but remain statistically significant at 1% level.

Finally, to address potential concerns about within-group correlation, in models 7–9 we adjust the standard errors by allowing for correlation in the error term by state. With clustered standard errors at the state level, the results remain similar to those without this correction.

In table 7, we run the regressions of models 1–3 from table 6 in subgroups by the ruling political party at the moment of debt issuance. Interestingly, the relationship is not symmetrical; politicians affiliated with opposing parties do not react symmetrically when facing similar political hazards. Independent officials seem to be the most responsive to political hazards, while Democrats are more sensitive to political hazards than Republicans.

We now discuss the results when aggregating bonds by year and election cycle. The

results are similar. Table 8 shows the correlation between political contestability as measured by election victory margin and the percentage of municipal bonds issued as revenue bonds within a year (models 1–3) and mayor's term, i.e., her political cycle (models 4–6). The signs on the coefficients of interest are as expected—as the margin of victory in a mayoral election increases the proportion of revenue bonds decreases. The *margin* and *large margin* variables are of the expected sign, statistically significant, and economically meaningful. An increase in one quintile in the winning margin decreases by 3.9–4.1%, and a *large margin* of win increases by 8.3–10% the share of revenue bonds in the portfolio of debt issuance. *Partisan swings* are of the right sign, but not significant at the year and election cycle aggregation.

5.3 Sale Method: Negotiated versus Competitive

Using the same data as before, we test whether mayors in areas with less political scrutiny choose the negotiated sale procedures to issue public debt. Confirmatory evidence would further support the notion that political considerations may supplement economic efficiency considerations as an explanation for features of public contracts. As in our first set of regression, we estimate linear probability regressions with the sale method as the dependent variable (with a dummy variable equal to one if the method is competitive sale). The specifications are otherwise identical to those above.

The results from this set of regressions are consistent with our predictions. Table 9 presents estimates from a linear probability regression of the competitive sale dummy variable on political contestability as measured by the margin of victory, large winning margin, and partisan swings. Similar to table 5, the coefficients on the political risk measure are signed as expected and significant. The point estimates suggest that an increase in the winning candidate's margin of victory of one quintile is correlated with a 1.7% decrease in the probability of debt being issued in a competitive bid. The *large margin* variable is larger in magnitude—5.4%—suggesting that highly contested municipalities are more likely to issue bonds through competitive sales at a level that is both economically and statistically significant.

We see similar results using the number of party swings to measure political risk (model 3). The sign is as expected and significant. The point estimate on *partisan swings* suggests

that one additional political party change in the last three cycles increases the likelihood of using a competitive sale procedure by 7.4%.

When including city-level economic and demographic controls (models 4–6), the signs and significance of the coefficients remain the same, with even greater magnitudes. The addition of industry fixed effects (models 7–9) lower the magnitude of the estimates, which remain statistically significant at the 1% level.[20]

5.4 Elected Mayors versus Appointed City Managers

There is variation across cities in the form of governance, with the two most common forms being Council-Manager and Mayor-Council (Levin and Tadelis 2010).[21] In a Council-Manager government, a professional city manager—who is appointed by the city council—is responsible for administration. While the city council is generally prohibited from interfering with the city manager's administration, the manager serves at the council's discretion. The position of "mayor" in these cities is largely ceremonial. In some cases, the executive is the council itself under commission with the various tasks divided up among council members.

In contrast, a Mayor-Council government consists of an elected mayor who serves as the city's chief executive officer. These cities may also appoint a city manager, but the mayor maintains authority over city operations. Given the differences between these two forms of local governance, measures of political risk should not be a factor in bond type in cities where mayors do not have the administrative authority to issue municipal securities.

Prior work has shown that the form of city executive governance affects spending decisions (Coate and Knight 2011; Vlaicu and Whalley 2016). Our empirical test relies on the assumption that mayors are politically accountable for the type and form of debt issued. If mayors are not politically accountable for issuing bonds, then our political risk variables should not be predictive of bond type and method of sale. Thus, following Levin and Tadelis (2010) and Coate and Knight (2011), we explore whether our results are robust to differen-

[20] In unreported regressions, we rerun the same estimations with logit regressions. The results remained qualitatively the same. When clustering at the city level, the margin quintile estimator falls short of significance at conventional levels, which maybe due to unbalanced size of clusters (i.e., our dataset has many cities with only one or two bond issues) and a limited number of elections per city.

[21] For a detailed account of the forms of municipal government, see: National League of Cities, http://www.nlc.org/build-skills-and-networks/resources/cities-101/city-structures/forms-of-municipal-government (accessed April 14, 2016).

tiation between mayor-run and manager-run cities.

We matched the type of executive for all cities in our sample.[22] The t-test of means of share of revenue bonds issued by elected mayors and appointed managers confirms that the two groups are statistically similar.We then run our basic specification separately for Mayor-Council and Council-Manager cities.[23] The results in table 10 show that elected mayors not only issue more revenue bonds (see constant), but also are more sensitive to political contestability than appointed city managers.

The control variables also unearth interesting insights: Whereas for the choice of bond type city managers are more concerned than elected mayors about ratings and deal size, elected mayors seem to consider social variables—i.e., population and unemployment rate—to issue revenue bonds.

6 Limitations and Prospective Research

Our research is stinted by a number of limitations. First, our time series run from 1980 to 2002, with a maximum of five elections and three partisan swings in this period, which limits the within-city variation. Second, because the demographics and financial data on municipalities are not standardized, we had to rely on county-level data. Third and most notably, all presented regressions are correlations between political contestability and either the probability of issuing a revenue bond or using competitive bidding as a sale method. One possible way to test for causality would be to exploit an exogenous shock to political risks. Unfortunately, we are unable to exploit such variation with our data.

Two alternative (and interrelated) stories to the third-party political opportunism hypothesis might confound our results. Foremost, selected project types might be endogenous to the political environment of the public agent and correlated with financing bond type. For

[22] The form of government data comes from multiple sources: International City/County Management Association, *Municipal Form of Government 2001* (ICMA 2001); Illinois City/County Management Association, *Municipalities with Managerial Form of Government* (https://www.ilcma.org/wp-content/uploads/2015/06/Council-Manager-Form-of-Govt_Municipalities_201212131435347391.pdf, accessed April 30, 2016); MRSC Local Government Success, *Washington City and Town Profiles* (http://mrsc.org/Home/Research-Tools/Washington-City-and-Town-Profiles.aspx, accessed April 30, 2016); and multiple official city websites.

[23] We grouped municipalities with "Commission" form of government (79 observations) along with "Council-Mayor," and disregarded municipalities with "Town Meeting" and "Representative Town Meeting" form of government (89 and none observations in our sample, correspondingly).

example, where political contestability is high, mayors may be more likely to issue public debt to fund more popular and visible projects, such as schools, rather than debt for projects that impact, say, public utilities (Robinson and Torvik 2005). Subsequently, a mayor might not be able to issue G.O. bonds due to debt overhang from former administrations (Alesina and Tabellini 1990) and, hence, be forced to issue revenue bonds. In both cases, revenue bonds would be correlated with political contestability.

Although we are not able to fully reject these alternative explanations with clear-cut empirical strategies, we can address the aforementioned factors with indirect evidence. First, populistic expenses would bias our estimates downwards (i.e., political contestability would correlate to more G.O. bonds). Second, even if the type of project correlates to the type of bond, it does not diminish the fact that the choice of projects and adequate financing instruments was driven by political contestability concerns. In this case, the type of bond can be interpreted as an "instrument" of the preferences for the type of project under political competition. When we include industry controls with our specifications (see table 6, models 4–6), the estimates related to political contestability remain statistically robust, albeit lower in magnitude than without industry controls. Regarding the method of bond sale, our results carry on with the addition of industry fixed effects (see table 9, models 7–9). Third, should political contestability lead to general debt overhang initially and, next, to unavoidable revenue bond financing, our estimates would be netted by the preference for G.O. in previous contested administrations. Indeed, our results are consistent with and without year fixed effects (cfr. tables 5 and 6); the same is applicable for method of sale (see table 9).

There are a number of tests that can be prospectively conducted to both check the robustness of the results presented here and to investigate additional hypotheses:

(a) *Term limits*

We might expect that mayors who are in the final term of office before being "termed out" would not be sensitive to political risk (although they may still be concerned about their legacy and the party's reputation). Therefore, for this subset of mayors who are in their final term of office as mayor, political risk should not be a determinant of bond type.

(b) *Types of projects*

It may be interesting to explore whether the level of political risk faced by a mayor influences her selection of projects to finance, and to what extend this affects the type of financing and method of sale.

(c) *Referendum supermajorities*

The only state that provides systematic information on G.O. bond referenda is California.[24] Anecdotal evidence shows a significant increase in the level of G.O. bond issuance after 2000 in California, coinciding with the approval of Proposition 39, which lowered the required referendum approval supermajority for G.O. bonds from two-thirds to 55%,[25] thus lowering the risk of failing to pass the G.O. bond referenda (Edwards 2008). Even though we do not account for the required approval majorities, we are confident that our state and year fixed effects absorb much of the bond referenda legislation heterogeneity.

(d) *Debt ceilings*

Being up against a local debt limit can encourage local governments to use revenue bonds (often exempted from debt limits under the "special fund" doctrine). If cities near their debt limits are more likely to have competitive elections (e.g., because voters are unhappy with the excessive debt), they may issue more revenue bonds.

We control for city credit ratings (time-varying average of two major agencies notch by notch, which should arguably take into consideration debt constraints as a function of debt capacity); but debt closer to the limit would not necessarily be rated worse than a similar city with a similar debt load and no debt limit. After all, a lender to a city with a debt limit may think that the city will not keep borrowing further, endangering its ability to pay the lender back. Conversely, a lender to a city without a debt limit might be afraid that the city will keep borrowing, making the investment worse. Moreover, debt limits are set by state constitutions (i.e., by a different sovereign) and are often long in

[24] See: California Elections Data Archive, http://www.csus.edu/calst/california_elections_data_archive.html (accessed March 10, 2016). Beyond this, getting information on bond referenda requires collecting information from county electoral offices: one county and one year at the time (to the extent that counties even post that information).

[25] See: California Proposition 39: School Facilities. 55% Local Vote. Bonds, Taxes. Accountability Requirements. Initiative Constitutional Amendment and Statute. Official Title and Summary Prepared by the Attorney General, 2000, http://vig.cdn.sos.ca.gov/2000/general/pdf/39.pdf (accessed March 10, 2016).

the tooth, and thus are plausibly exogenous to municipal politics.

Our year and state fixed effects treat take care of legislated debt limits variations. An empirical test with debt limits at the city level is challenging because they are a function of assessed property values. To our knowledge, the only US-wide data sources (for limits and assessed values) date to 1970s and 1980s, i.e., do not match our data frame. A plausible source of information are the reports issued by the investment banks that underwrite municipal bonds.[26]

(e) *Welfare implications*

The ultimate question concerns the societal *cost* of political contestability. Given a financially healthy municipality (i.e., no debt ceilings constraints that would limit the financing choices), when a politician chooses a revenue bond instead of a G.O. bond, there may be a transfer of wealth from the taxpayer to the politician (i.e., not to the bondholder, who prices in all risks). Consider the following argument:

i. The taxpayer does not choose the bond type; the politician acts as a monopolist (i.e., she manages the supply of securities by type) during her term in office;
ii. The politician "insures" some non-diversifiable risk for which the taxpayer does not care (e.g., third-party challenges of misuse of funds, avoiding losing face in a G.O. referendum, and limiting the expending options of political opponents);
iii. Should it exist, the premium for political insurance would be given by a municipal G.O./revenue bond swap;
iv. If the taxpayer could choose every time the form of financing (e.g., through referenda also in the case of revenue bonds) and retire and reissue debt, the municipal G.O./revenue bond swap price would approach to zero.

Because the taxpayer cannot choose the type of bond and there are no bond-type swaps, when the choice of bond type is driven by political factors, there is a welfare transfer from the the taxpayer to the politician. I.e., revenue bonds bear higher interest rates and, thus, are more expensive to the taxpayer because she pays an implicit insurance

[26] These reports can be found in a variety of legal databases (e.g., LexisNexis). Arranging the data in a useful manner, however, would be a monumental task.

premium for the politician.

The difference in yields to maturity between revenue and G.O. bonds does not equate to the difference in social cost, but; nevertheless, it is an integral part of the computation. Unfortunately, municipal bonds feature complex structures—including different types of coupons (zero, fixed, or adjustable coupon), interest rate benchmarks (fixed or adjustable), and discounts/premiums at issuance—which are not fully disclosed, particularly for bonds issued through negotiated sales. Thus, our data only allows for the computation of the yields to maturity for a fraction of the bonds.

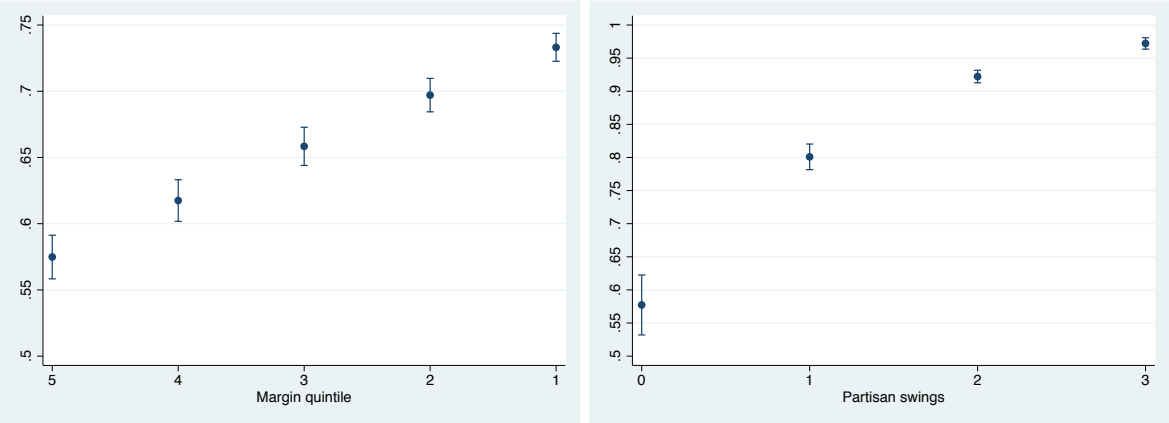
7 Concluding Remarks

In this paper, we test whether political contestability is a determinant of the type of bond and method of sale issued by municipalities. The empirical research of municipal financing consists of a long chain of tenuous inferences fraught with technical complexities in every link: beginning with diverse needs; compounded by heterogeneous and sophisticated financial instruments; compounded by uninformed taxpayers; compounded by scarce nationwide data; compounded by the lack of exogenous shocks, good instruments, or discontinuities in political accountability to draw causal inferences. The result of this lengthy cascading of complexities is a reduced form of estimations about the aggregate welfare impacts of discretionary action of public agents to political hazards.

Using several types of specifications and measures of political risk, we find empirical evidence that is consistent with the hypothesis that mayors in more contested political environments issue more rigid revenue bond and use less discretionary competitive bidding. In both the baseline regressions and the regressions using city-level control variables, the point estimates on the closeness of mayoral races and degree that the mayor's seat changes party hands are of the expected sign and significant. Specifically, narrowing election victory margins by one quintile increases the probability of debt being issued through a revenue bond by 2.7–4.2%, while an increase in the number of partisan swings in the past electoral races by one standard deviation leads to an increased probability of issuing a revenue bond by 8.2% (see Figure 1). These results are more salient given that a large part of the municipal budget is fixed and tight to particular sources of financing, and only a fraction is subject to

policymakers discretion.

Figure 1: This figure presents the predicted probability of issuing a municipal bond as a revenue bond versus a general obligation bond, computed as the marginal effects of a change in the quintile of margin of victory vote (left graph) and number of partisan swings in the past three electoral races (right graph). The vertical bars represent the 95% confidence intervals of the point estimates for quintile of victory margin and partisan swings, respectively. Lower margin of victory quintile and more partisan swings in the past elections mean more politically contestable environment (from left to right).



We find also evidence that revenue bonds are more likely to be issued during the later years of mayoral terms and elected mayors are more prone to using revenue bonds than appointed city managers.

The corollary is that the choice of revenue bonds in politically contestable municipalities, when otherwise a G.O. bond would be economically feasible, represents a welfare transfer from taxpayers to lenders, as lenders receive an interest premium over interest rate appropriate to the credit risk of the borrowing municipality. In other words, politicians at risk of losing office *buy* political insurance (choose financial instruments less hazardous to politicians, but not having the backing of all forms of city finance more risky of default to the lenders) and externalize the additional cost to the public at large. Taxpayers' unawareness of "small" misallocations makes them susceptible to overcharges.

Four policy implications follow from the presented analysis. First, rating agencies should incorporate political variables into their algorithms.[27] Consider revenue bonds issued in two

[27] Rating agencies provide qualitative political analysis without formal modeling. Cf. Moody's municipal bond rating methodology (Moody's 2007).

financially similar cities, but one politically stable and the other politically hazardous. The aforementioned research suggests that in the second case, the choice of revenue bonds was not purely economic, but politically stained, and thus more likely inefficient. Disentangling political and financial risks could help fine-tune the risk premiums for revenue bonds in politically contestable but financially stable municipalities.

Second, to dis-incentivize the "strategic" use of revenue bonds in politically contestable municipalities, issues above a certain amount in absolute or relative terms (e.g., $2 billion or 2% of a municipality's annual tax revenues) should be subject to a referendum similarly to G.O. bonds.[28]

Third, negotiated sales are a mechanism less subject to public control, and therefore more prone to favoritism compared to competitive bids. There is evidence of placement of direct loans by municipalities, in which public officials have absolute discretion regarding the choice of underwriter and terms (Nguyen, Volla, and Wong 2017). Both negotiated sales and private placements of municipal debt should be under the scrutiny of regulators, especially in light of corporate contributions and possible *quid pro quo* deals.

Finally, increased information to taxpayers about bond issues' covenants and costs will increase scrutiny and accountability of politicians in office, limit their strategic behavior regarding financing instruments and sales mechanisms, and thus lower the welfare transfer from taxpayers to lenders.

[28] The California Voter Approval Requirement for Revenue Bonds above $2 Billion Initiative, also known as Proposition 53, was on the ballot in California on November 8, 2016 as an initiated constitutional amendment.
A "yes" vote supported requiring voter approval before the state could issue more than $2 billion in public infrastructure bonds that would require an increase in taxes or fees for repayment.
A "no" vote opposed this measure requiring voter approval before the state could issue more than $2 billion in public infrastructure bonds that would require an increase in taxes or fees for repayment.
Supporters of Proposition 53 referred to it as the "No Blank Checks Initiative." The measure was defeated 6,660,555 votes (50.58%) to 6,508,909 votes (49.42%). Interestingly, the top two donors against Proposition 53 were the incumbent Gov. Brown's 2014 gubernatorial campaign committee and the California Democratic Party. See: https://ballotpedia.org/California_Proposition_53,_Voter_Approval_Requirement_for_Revenue_Bonds_above_$2_Billion_2016.

Table 3: This table provides bond rating conversion codes for Moody's and S&P ratings used in the analysis.

Conversion number	**Moody's ratings**	**S&P ratings**
23	Aaa+	AAA+
22	Aaa	AAA
21	Aa1	AA+
20	Aa2	AA
19	Aa3	AA–
18	A1	A+
17	A2	A
16	A3	A–
15	Baa1	BBB+
14	Baa2	BBB
13	Baa3	BBB–
12	Ba1	BB+
11	Ba2	BB
10	Ba3	BB–
9	B1	B+
8	B2	B
7	B3	B–
6	Caa1	CCC+
5	Caa2	CCC
4	Caa3	CCC–
3	Ca	CC
2	C	C
1	D	D

Table 4: This table presents summary statistics of city traits, political variables, and municipal bonds.

Variable	Mean	Std. Dev.	Min.	Max.	N
Panel A: City Traits					
County Population (thousands ppl.)	1454.49	2105.22	18.11	9663.08	1173
Median Real Per Capita Income ($)	23380.68	9043.66	3474.1	63205.38	1181
Unemployment Rate	5.48	1.66	2.3	12.8	1105
Population Density	1925.51	4084.15	10.31	32082.28	1173
Panel B: Political Variables					
Democrat (mean=%)	0.4	0.49	0	1	819
Republican (mean=%)	0.32	0.47	0	1	819
Victory margin (%)	38.61	31.54	0.01	100	792
Partisan swings	0.2	0.45	0	3	819
Panel C: Municipal Bonds					
Revenue Bonds (mean=%)	0.65	0.48	0	1	6505
Bond Total Size ($ millions)	86.19	165.26	0.05	985	6491
Bond Face Value ($ millions)	9.87	28.71	0.01	650	5776
Moodys Rating	17.95	2.92	2	22	3941
S&P Rating	18.61	2.36	1	22	3604
Competitive Bidding Mech.	0.17	0.37	0	1	6505
Industry-Trans. (mean=%)	0.03	0.17	0	1	6505
Industry-Housing (mean=%)	0.12	0.33	0	1	6505
Industry-Education (mean=%)	0.21	0.41	0	1	6505
Industry-Economic Dev.(mean=%)	0.05	0.22	0	1	6505
Industry-Public Utility (mean=%)	0.1	0.29	0	1	6505
Fixed Coupon Bond (mean=%)	0.63	0.48	0	1	6505
Zero Coupon Bond (mean=%)	0.24	0.43	0	1	6505
Adj. Coupon Bond (mean=%)	0.12	0.32	0	1	6505
Maturity Length (yrs)	22.17	6.8	1	100	6505

Table 5: This table presents results from linear probability and logit regressions of the choice of bond structure (revenue bond=1) on political contestability. Political contestability measures are given by election margins of victory quintiles, a dummy equal to 1 when the winning margin was large (above 20 percentage points), and the number of political party swings in mayoral control. Controls include a city's average bond ratings, the natural logarithm of deal size, and the year within a mayor's term. The sample period is 1980-2002. In logit regressions, we report marginal effects. T-statistics are in parenthesis; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Election Outcome and Choice of Revenue Bonds

(Dependent Variable: Revenue Bonds Dummy)

	OLS			Logit		
	(1)	(2)	(3)	(4)	(5)	(6)
Margin Quintiles	-0.0275***			-0.0272***		
	(-6.29)			(-6.36)		
Large Margin		-0.0842***			-0.0837***	
		(-6.71)			(-6.81)	
Partisan Swings			0.144***			0.153***
			(13.15)			(13.40)
Avg. Rating	-0.0285***	-0.0295***	-0.0318***	-0.0325***	-0.0338***	-0.0364***
	(-12.53)	(-13.06)	(-14.19)	(-12.57)	(-13.13)	(-14.28)
Deal Size	0.0341***	0.0352***	0.0268***	0.0340***	0.0351***	0.0256***
	(9.05)	(9.41)	(7.09)	(9.21)	(9.58)	(6.89)
2nd year in office	-0.0121	-0.0182	-0.0188	-0.0111	-0.0172	-0.0185
	(-0.77)	(-1.18)	(-1.23)	(-0.72)	(-1.13)	(-1.24)
3rd year in office	0.0441**	0.0391**	0.0460***	0.0454**	0.0406**	0.0445**
	(2.43)	(2.18)	(2.59)	(2.48)	(2.25)	(2.50)
4th year in office	0.0757***	0.0761***	0.0743***	0.0772***	0.0777***	0.0768***
	(4.11)	(4.17)	(4.14)	(4.12)	(4.18)	(4.20)
Observations	5546	5613	5613	5546	5613	5613
R^2	0.051	0.054	0.075			
Pseudo R^2				0.043	0.045	0.064

Table 6: This table presents results from linear probability regressions of the choice of bond structure (revenue bond=1) on political contestability. Political contestability measures are given by election margins of victory quintiles, a dummy equal to 1 when the winning margin was large (above 20 percentage points), and the number of political party swings in mayoral control. Controls include average bond ratings, the natural logarithm of deal size, population, population density, median real income per capita in thousand US$, unemployment rate, and the year within a mayor's term. Regressions also include state-year and industry fixed effects. The sample period is 1980-2002. Standard errors are clustered at the state level. T-statistics are in parenthesis; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Election Outcome and Choice of Revenue Bonds with State-year and Industry Controls, and Clustered Standard Errors

(Dependent Variable: Revenue Bonds Dummy)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Margin Quintiles	-0.0422***			-0.0135***			-0.0422***		
	(-7.75)			(-4.46)			(-7.23)		
Large Margin		-0.0842***			-0.0273***			-0.0842***	
		(-5.50)			(-3.24)			(-5.73)	
Partisan Swings			0.182***			0.0679***			0.182***
			(12.66)			(8.49)			(9.34)
Avg. Rating	-0.0362***	-0.0375***	-0.0378***	-0.00846***	-0.00893***	-0.00949***	-0.0362***	-0.0375***	-0.0378***
	(-13.92)	(-14.39)	(-14.70)	(-5.62)	(-5.98)	(-6.38)	(-4.19)	(-4.13)	(-3.98)
Deal Size	0.0104**	0.0132***	0.00781*	-0.000254	0.000582	-0.00148	0.0104	0.0132	0.00781
	(2.51)	(3.17)	(1.90)	(-0.10)	(0.24)	(-0.61)	(0.32)	(0.39)	(0.25)
Population	0.0285***	0.0177*	-0.00626	0.00974*	0.00643	-0.00208	0.0285*	0.0177	-0.00626
	(2.80)	(1.74)	(-0.61)	(1.73)	(1.16)	(-0.37)	(1.86)	(0.92)	(-0.42)
Density	0.0299***	0.0367***	0.0446***	0.0237***	0.0243***	0.0270***	0.0299**	0.0367**	0.0446**
	(2.73)	(3.34)	(4.10)	(3.89)	(4.02)	(4.50)	(2.25)	(2.26)	(2.35)
Income per Capita	0.00150	-0.000242	-0.000439	-0.0000580	-0.000339	-0.000363	0.00150	-0.000242	-0.000439
	(1.01)	(-0.16)	(-0.30)	(-0.07)	(-0.42)	(-0.46)	(1.33)	(-0.12)	(-0.20)
Unemployment Rate	0.0103	0.00770	0.00815	0.00786	0.00792	0.00739	0.0103*	0.00770	0.00815
	(0.19)	(0.14)	(0.15)	(0.26)	(0.26)	(0.25)	(1.73)	(1.05)	(0.97)
State-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	No	No	No	Yes	Yes	Yes	No	No	No
Observations	4943	5009	5009	4943	5009	5009	4943	5009	5009
R^2	0.410	0.400	0.416	0.823	0.824	0.826	0.410	0.400	0.416
Clustered at state	No	No	No	No	No	No	Yes	Yes	Yes

Table 7: This table presents results from linear probability regressions of the choice of bond structure (revenue bond=1) on political contestability in subgroups by political parties. Political contestability measures are given by election margins of victory quintiles, a dummy equal to 1 when the winning margin was large (above 20 percentage points), and the number of political party swings in mayoral control. Controls include average bond ratings, the natural logarithm of deal size, population, population density, median real income per capita in thousand US$, unemployment rate, and the year within a mayor's term. The sample period is 1980-2002. T-statistics are in parenthesis; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Election Outcome and Choice of Revenue Bonds in Subgroups by Political Parties

(Dependent Variable: Revenue Bonds Dummy)

	Democrat			Republican			Other		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Margin Quintiles	-0.0228***			-0.00928			-0.0613***		
	(-3.35)			(-0.92)			(-5.78)		
Large Margin		-0.109***			-0.00946			-0.159***	
		(-5.61)			(-0.36)			(-4.98)	
Partisan Swings			0.0842***			0.0783***			0.482***
			(4.06)			(3.79)			(6.67)
Avg. Rating	-0.0245***	-0.0255***	-0.0241***	-0.0300***	-0.0285***	-0.0292***	-0.0557***	-0.0626***	-0.0551***
	(-7.95)	(-8.35)	(-7.89)	(-6.87)	(-6.62)	(-6.82)	(-9.25)	(-10.34)	(-9.14)
Deal Size	0.0230***	0.0235***	0.0234***	-0.0432***	-0.0430***	-0.0462***	0.0848***	0.0861***	0.0784***
	(4.25)	(4.39)	(4.35)	(-6.62)	(-6.64)	(-7.09)	(7.44)	(7.33)	(6.80)
Population	0.0840***	0.0777***	0.0686***	0.0328*	0.0281	0.0200	0.0347*	0.00846	0.0117
	(5.37)	(5.09)	(4.31)	(1.71)	(1.48)	(1.06)	(1.85)	(0.45)	(0.63)
Density	-0.0562***	-0.0488***	-0.0513***	0.101***	0.105***	0.102***	-0.0802***	-0.0603***	-0.0741***
	(-4.24)	(-3.73)	(-3.92)	(4.90)	(5.20)	(5.09)	(-3.64)	(-2.80)	(-3.46)
Income per Capita	-0.0126***	-0.0131***	-0.0123***	-0.00337	-0.00463**	-0.00372	0.0230***	0.0170***	0.0170***
	(-6.97)	(-7.43)	(-6.89)	(-1.44)	(-2.03)	(-1.63)	(6.85)	(5.23)	(5.30)
Unemployment Rate	-0.00508	-0.00515	0.00325	-0.00544	-0.0202	-0.0230	0.0729	0.117**	0.0426
	(-0.25)	(-0.26)	(0.16)	(-0.17)	(-0.66)	(-0.76)	(1.31)	(2.05)	(0.77)
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	2081	2101	2101	1880	1904	1904	982	1004	1004
R^2	0.452	0.459	0.455	0.363	0.364	0.369	0.427	0.391	0.403

Table 8: This table presents results from OLS regressions of the percentage of revenue bonds in a given year (Panel A) and over a mayor's term (Panel B) on political contestability. Political contestability measures are given by election margins of victory quintiles, a dummy equal to 1 when the winning margin was large (above 20 percentage points), and the number of political party swings in mayoral control. Controls include average bond ratings, the natural logarithm of deal size, population, population density, median real income per capita in thousand US$, unemployment rate, and the year within a mayor's term. Regressions also include year and state fixed effects. The sample period is 1980-2002. T-statistics are in parenthesis; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Panel A: Revenue Bonds by Year
(Dependent Variable: Percentage of Revenue Bonds)

	(1)	(2)	(3)
Margin Quintiles	-0.0387***		
	(-3.39)		
Large Margin		-0.0834**	
		(-2.58)	
Partisan Swings			0.0421
			(1.34)
Avg. Rating	-0.0231***	-0.0258***	-0.0257***
	(-3.95)	(-4.42)	(-4.38)
Deal Size	0.00601	0.00903	0.00945
	(0.71)	(1.07)	(1.11)
Population	0.0307	0.0229	0.0191
	(1.40)	(1.05)	(0.87)
Density	0.00296	0.00670	0.00714
	(0.14)	(0.33)	(0.35)
Income per Capita	0.00113	-0.00108	-0.00148
	(0.38)	(-0.37)	(-0.51)
Unemployment Rate	0.0340	0.0352	0.0322
	(1.21)	(1.26)	(1.15)
Years in Office	0.0116	0.0120	0.0127
	(0.75)	(0.78)	(0.81)
Year fixed effects	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes
Observations	730	748	748
R^2	0.337	0.326	0.321

Panel B: Revenue Bonds by Election Cycle
(Dependent Variable: Percentage of Revenue Bonds)

	(1)	(2)	(3)
Margin Quintiles	-0.0415***		
	(-3.14)		
Large Margin		-0.100***	
		(-2.64)	
Partisan Swings			0.0467
			(1.18)
Avg. Rating	-0.0214***	-0.0247***	-0.0245***
	(-2.96)	(-3.43)	(-3.39)
Deal Size	0.0169*	0.0190**	0.0192**
	(1.79)	(2.01)	(2.00)
Population	0.0198	0.00964	0.00666
	(0.74)	(0.37)	(0.25)
Density	0.0109	0.0179	0.0188
	(0.43)	(0.70)	(0.74)
Income per Capita	0.000381	-0.00203	-0.00260
	(0.11)	(-0.59)	(-0.75)
Unemployment Rate	0.0223	0.0162	0.0144
	(0.71)	(0.52)	(0.46)
Terms in Office	0.00353	0.0200	0.0137
	(0.11)	(0.62)	(0.42)
Year fixed effects	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes
Observations	531	549	549
R^2	0.369	0.354	0.347

Table 9: This table presents results from linear probability regressions of the method of sale of municipal bonds (competitive bidding=1) on political contestability. Political contestability measures are given by election margins of victory quintiles, a dummy equal to 1 when the winning margin was large (above 20 percentage points), and the number of political party swings in mayoral control. Controls include average bond ratings, the natural logarithm of deal size, population, population density, median real income per capita in thousand US$, unemployment rate, and year, state, and industry fixed effects. The sample period is 1980-2002. T-statistics are in parenthesis; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Election Outcome Margins and Method of Sale
(Dependent Variable: Competitive Sales Dummy)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Margin Quintiles	-0.0253***			-0.0239***			-0.0172***		
	(-6.10)			(-5.38)			(-3.94)		
Large Margin		-0.0668***			-0.0628***			-0.0483***	
		(-5.78)			(-5.16)			(-4.04)	
Partisan Swings			0.0514***			0.0613***			0.0465***
			(5.18)			(5.45)			(4.19)
Avg. Rating	0.00744***	0.00779***	0.00714***	0.00665***	0.00705***	0.00647***	0.00572**	0.00612***	0.00534**
	(3.53)	(3.73)	(3.41)	(2.99)	(3.20)	(2.94)	(2.56)	(2.76)	(2.40)
Deal Size	-0.0216***	-0.0215***	-0.0247***	-0.0281***	-0.0282***	-0.0312***	-0.0365***	-0.0360***	-0.0386***
	(-6.46)	(-6.47)	(-7.38)	(-7.38)	(-7.47)	(-8.24)	(-9.34)	(-9.31)	(-9.94)
Population				0.0308***	0.0280***	0.0196**	0.0144*	0.0127	0.00715
				(3.78)	(3.48)	(2.39)	(1.80)	(1.61)	(0.89)
Density				-0.0249***	-0.0237***	-0.0212***	-0.0116	-0.0104	-0.00911
				(-3.19)	(-3.08)	(-2.75)	(-1.51)	(-1.38)	(-1.20)
Income per Capita				0.00916***	0.00868***	0.00882***	0.00779***	0.00747***	0.00758***
				(8.10)	(7.88)	(8.01)	(7.05)	(6.95)	(7.05)
Unemployment Rate				-0.0240*	-0.0264**	-0.0360***	-0.0255**	-0.0270**	-0.0334***
				(-1.81)	(-2.00)	(-2.72)	(-1.96)	(-2.10)	(-2.58)
Year fixed effects	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	No	No	No	No	No	No	Yes	Yes	Yes
Observations	5192	5263	5263	4647	4718	4718	4647	4718	4718
R^2	0.158	0.158	0.157	0.207	0.205	0.206	0.256	0.256	0.256

Table 10: This table presents results from OLS regressions of the percentage of revenue bonds by type of city executive: Mayor-Council (models 1–3) and Council-Manager (models 4–6). Political contestability measures are given by election margins of victory quintiles, a dummy equal to 1 when the winning margin was large (above 20 percentage points), and the number of political party swings in mayoral control. Controls include average bond ratings, the natural logarithm of deal size, population, population density, median real income per capita in thousand US$, unemployment rate, and year, state, and industry fixed effects. The sample period is 1980-2002. T-statistics are in parenthesis; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Election Outcome and Choice of Revenue Bonds in Subgroups by Type of City Executive

(Dependent Variable: Revenue Bonds Dummy)

	Elected Mayors			Appointed Managers		
	(1)	(2)	(3)	(4)	(5)	(6)
Margin Quintiles	-0.0338***			-0.00945		
	(-4.88)			(-1.38)		
Large Margin		-0.107***			-0.0311	
		(-5.39)			(-1.64)	
Partisan Swings			0.109***			0.0858***
			(6.68)			(4.77)
Avg. Rating	-0.0142***	-0.0148***	-0.0150***	-0.0382***	-0.0401***	-0.0417***
	(-4.71)	(-4.92)	(-5.02)	(-10.54)	(-11.26)	(-11.75)
Deal Size	-0.0164***	-0.0170***	-0.0178***	0.0807***	0.0833***	0.0729***
	(-3.13)	(-3.24)	(-3.40)	(11.11)	(11.52)	(9.86)
Population	0.0467***	0.0567***	0.0319***	0.0196*	0.0104	0.0122
	(4.74)	(5.63)	(3.19)	(1.96)	(1.06)	(1.25)
Density	-0.0346***	-0.0373***	-0.0268***	0.0342***	0.0394***	0.0427***
	(-5.60)	(-5.96)	(-4.55)	(3.08)	(3.61)	(3.93)
Income per Capita	-0.00797***	-0.00889***	-0.00898***	-0.0102***	-0.0109***	-0.0106***
	(-5.84)	(-6.49)	(-6.59)	(-7.43)	(-8.05)	(-7.87)
Unemployment Rate	0.0193**	0.0164**	-0.000536	-0.0105	-0.0135	-0.0116
	(2.34)	(2.00)	(-0.06)	(-1.25)	(-1.62)	(-1.39)
Constant	1.091***	0.982***	1.255***	-0.201	-0.0954	0.000885
	(7.17)	(6.63)	(8.12)	(-1.22)	(-0.59)	(0.01)
Observations	2404	2411	2411	2464	2523	2523
R^2	0.055	0.057	0.063	0.123	0.127	0.134

Appendix A Construction of Dataset

We merged two datasets: municipal bonds issued from 1981 to 2002 and election outcomes in mayor cities from 1980 to 2004. The bond dataset have more municipal-year observations than the elections dataset. We thus adopted a two-way strategy. First, we applied all the election-year data (which constitutes the data used to create the political risk measures) in all years between elections. We then separately aggregated bond data by election cycles.

Specifically, we treated the data as follows:

1. In the bond database, we aggregated bonds by type and municipality-year of issuance
2. In the elections database we:
   (a) Generated a dummy variable $election\_year\_dummy = 1$ for all records
   (b) Generated $last\_election\_year = year$
   (c) Generated non-election subsequent years in $year$, and repeated all other variables—$last\_election\_year$ and last election outcomes—until the next election year observation
   (d) Generated a variable $timing_t = year_t - last\_election\_year_t$ to check for opportunistic electoral cycle timing (timing fixed effects)
   (e) Generated a variable $tenure\_years_t = \arg\max j | mayor\_name_t = mayor\_name_{t-j} \wedge j = \{1, 2, \ldots, 20\}$ for the same mayor in office (by name) to check for risk propensity and learning by mayors (tenure_year fixed effects)
   (f) Generated a variable $tenure\_cycles_t = \mathbb{Z}\left[tenure\_years_t/4\right]$ for the same mayor in office (by name) to check for risk propensity and learning by mayors (tenure_cycles fixed effects)
3. We merged the two datasets matched by municipality and year:
   (a) For year regressions, we collapsed the merged dataset summing bond issues by municipality, type of bond, and year of issuance
   (b) For political cycle regressions, we collapsed the merged dataset summing bond issues by municipality, type of bond, and $last\_election\_year$

Appendix B Types of Bonds

In addition to G.O. and revenue bonds, there are a few other common types of municipal securities. **Limited-tax General Obligation Bonds** require a local government to levy a property tax sufficient to meet its debt service obligations, but only up to a statutory limit. Generally, local governments can choose to use a portion of the property tax they already levy or increase their property tax by an amount equal to its debt service payments.

Certificates of Participation (COPs) are a form of lease revenue bond that permit the investor to participate in a stream of lease payments, installment payments, or loan payments relating to the acquisition or construction of specific equipment, land, or facilities. In theory, the certificate holder could foreclose on the equipment or facility financed in the event of default, but so far no investor has ended up owning a piece of a school house or a storm drainage system.

Municipal Notes are short-term obligations, generally maturing in one year or less. The most common types include: (1) bond anticipation notes (BANs), (2) grant anticipation notes (GANs), (3) revenue anticipation notes (RANs), (4) tax anticipation notes (TANs), (5) tax and revenue anticipation notes (TRANs), (6) project notes, and (7) construction loan notes.

Bonds Backed by Special Taxes and Assessments are often due on the same dates as property taxes, to compensate for their levied, but still unpaid, share.

Tax Allocation Bonds are issued to pay the cost of land and building acquisition and their redevelopment, and are repaid by the incremental increase in tax revenues produced by the increase in the assessed value of the area after redevelopment.

Appendix B.1 Data Treatment

Because some of these categories are closely related to either G.O. or revenue bonds, we lumped them into one of the two categories. In the construction of the final bond dataset, we ignored notes, bonds backed by special taxes and assessments, and tax allocation bonds, and then aggregated:

(a) General obligation limited-tax bonds into **G.O. bonds** and

(b) COPs and tax allocation bonds into **revenue bonds**.

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