working paper 15 34

Premium Municipal Bonds and Issuer Fiscal Distress

Stephan Whitaker and O. Emre Ergungor

FEDERAL RESERVE BANK OF CLEVELAND

Working Paper 15-34 December 2015

Premium Municipal Bonds and Issuer Fiscal Distress

Stephan Whitaker and O. Emre Ergungor

Economic theory suggests that bond issuers of lower credit quality or higher opacity should be more likely to issue bonds with premium coupons (higher coupon rates relative to yields at issuance). Using a comprehensive data set of municipal bonds issued between 1992 and 2012 by more than 21,000 issuers, we show that this has not been the case until the early 2000s. We examine what changed in this market to bring it into greater alignment with economic principles. We argue that the Government Accounting Standards Board's Statement 34 that required the use of accrual accounting rules in government financial reports deserves the credit.

Keywords: Premium Bonds, Public Financial Management, Municipal Bonds, Fiscal Stress, GASB Statement 34

JEL Codes: H74, G280, R510.

Suggested citation: Whitaker, Stephan, and O. Emre Ergungor, 2015. "Premium Municipal Bonds and Issuer Fiscal Distress," Federal Reserve Bank of Cleveland, Working Paper no. 15-34.

Stephan Whitaker is at the Federal Reserve Bank of Cleveland and can be reached at stephan.whitaker@clev.frb.org. O. Emre Ergungor is at the Federal Reserve Bank of Cleveland and can be reached at ozgur.e.ergungor@clev.frb.org.

1 Introduction

Theoretical research has shown that the terms of debt contracts can be used to alleviate informational frictions between management and investors. Such arrangements are known to boost firm value (Barnea et al., 1980; Flannery, 1986; Hart and Moore, 1998; Aghion and Bolton, 2008; Leland, 1994; DeMarzo and Fishman, 2007; Chava et al., 2010; Dass and Massa, 2014). While governments are not subject to valuation pressures, asymmetric information problems between the elected officials, the electorate and investors are no less severe. For example, both theoretical and empirical results in the literature suggest that elected officials will seek to provide current benefits while delaying costs into future election cycles (Battaglini and Coate, 2008; Matsen and Thogersen, 2010; Song et al., 2012; Klomp and de Haan, 2013). If costs are pushed into the future, rollover risk could incentivize investors to demand higher coupons from such localities in order to reduce the duration of their exposure (He and Xiong, 2012). Similarly, less creditworthy issuers may have to pay premium coupons as a way to demonstrate their ability to generate cash through regular cash payments (Leland, 1994).

In this paper, we find that until early 2000s, fiscally-distressed localities did not issue premium bonds as predicted. Figure 2 shows that the share of premium bonds in total *dollar* issuance has been increasing in general since such municipal bonds received preferential tax treatment under Tax Reform Act of 1993. A large number of small-dollar issuers, however, switched to premium issuance after 2000 as evidenced by the trend break in the share of premium bonds in the total *number* of bonds issued (Figure 1) whereas the dollar issuance shows no such break. What has changed in the late 1990s that might have altered the behavior of small-dollar issuers?

In this paper, we argue that the adoption of better accounting rules is responsible for the altered behavior. On June 30, 1999, Governmental Accounting Standards Board (GASB) issued its Statement 34 establishing new financial reporting requirements for state and local governments. The goal of these changes was to increase transparency in local government

finances through the dissemination of comprehensive financial statistics reported using the same, uniform accrual accounting principles by all localities. As we describe in greater detail in the next section, accrual accounting lessens the impact of premium coupons on the government's year-end interest expense numbers. This is not to say that the new accounting rules are a window-dressing tool that artificially reduces spending. Cash-accounting does overstate the cost of borrowing with premium coupons because it does not capture the fact that investors paid more than par in return for higher coupons. By contrast, cash accounting underreports the true cost of discount bonds. Since almost all local governments operate under balanced budget requirements, overstated interest expense makes premium bonds unattractive, especially for distressed localities.

If the more opaque or financially-distressed local governments are more motivated to issue premium bonds but were discouraged from doing so by the cash accounting rules, we would expect them to increase their issuance after GASB 34 took effect. We combine Mergent's comprehensive data set of municipal bond issuance with the Census of Governments to test this hypothesis. We find evidence that after the GASB Statement 34, fiscal distress is positively related to the issuance of premium bonds. However, this finding is driven entirely by revenue bonds. The findings are robust to corrections for selection into issuance and a number of alternate specifications.

The analysis will proceed as follows. Section 2 will review the existing related literature and explain incentives created by the rule change. Section 3 will describe the data sets and definition of the variables. Section 4 will present descriptive statistics and model estimates. Conclusions can be found in section 5.

2 Literature

Among all the features of debt contracts, the level of coupons relative to the required yield at issuance has been the least studied. De and Kale (1993) examine the choice between fixed,

zero and contingent coupons as a signaling mechanism for credit quality but do not model the choice between discount, par, and premium coupons. Hackbarth, Miao, and Morellec (2006) and DeMarzo and Fishman (2007) establish that firms with volatile cash flows, and therefore higher likelihood of distress and costly liquidation, should prefer lower coupons to avoid a cash shortfall. Only recently, Amiram et al. (2014) provide evidence that supports this theory. They also show that opaque firms tend to issue bonds with higher coupons consistent with investors' desire to mop up excess free cash flows that may be wasted on negative NPV investments or organizational inefficiencies (Jensen, 1986). Finally, firms with low credit ratings, which may face higher rollover risk, issue higher coupon bonds because investors prefer to receive a larger share of their cash flows in advance before the rollover risk arises at maturity. This is consistent with the literature on the relationship between credit risk and rollover risk (He and Xiong, 2012).

Municipal issuers should be subject to the same economic principles that govern coupon-choice once we control for the fundamental institutional differences between the municipal and corporate debt markets. Taxation of investors is the most obvious difference. Since 1993, municipal bonds with premium coupons receive preferential tax treatment. While all coupons are exempt from federal income taxes (and state income taxes in the issuer's state with few exceptions), the appreciation of a market discount bond towards par may constitute taxable income (or capital gain) depending on the purchase price and the original issue discount. Premium bonds that depreciate towards par are not subject to any tax. One can see in the issuance data that the share of premium bonds in total dollar issuance has been rising since 1993 (see Figure 1). Yet, taxes do not explain the increasing share of premium bonds in the total number of issuances since 2000 (see Figure 2). If anything, the marginal tax rates fell after the Bush tax cuts were enacted. Also, there is no discernable change in the dollar amount of premium bond issuance; thus, the increase in numbers must be driven by small-dollar issuers.

The second fundamental difference is the taxing power of government. General obligation

(GO) bonds are backed by the full faith and credit of the issuing government and require annual legislative appropriation for their payouts.[1] By contrast, revenue bonds (REV) have a dedicated revenue stream and are not backed by the full faith and credit of the government. REVs that are issued to support social goals such as housing finance or business ventures (e.g., industrial revenue bonds, hospital bonds, etc.) can and do default if the revenue stream falls below the required payout. Therefore, the findings of the corporate finance literature on the relationship between low-creditworthiness and premium-coupon issuance should be more applicable to REVs.[2] However, this argument still does not explain why the most-distressed REV issuers were using discount coupons before 2000 and made the switch in that particular year (Figure 4). Also, GO issuers of all degrees of fiscal distress also stopped issuing discount bonds in 2000, which cannot be explained by the creditworthiness argument (Figure 3).

Another major difference between corporate and municipal issuers is their treatment in bankruptcy. Even though governments cannot be liquidated, financial distress at sub-sovereign level is resolved through Chapter 9 bankruptcy, which may impose haircuts on creditors.[3] Therefore, discount bonds should be preferred when cash flows are volatile as suggested by (DeMarzo and Fishman, 2007). In a municipal setting, Carroll (2009) has shown that local governments with diverse tax and non-tax revenue sources face lower revenue volatility. Because REVs have a single type of revenue source, they should be more likely to be issued with a discount coupon compared to GO bonds. Figures 1 and 2 confirm this hypothesis but this argument still does not explain the presence of the trend break in 2000.

[1]GO could mean different things in different localities. A county in OH can increase its taxes to pay its GO bond obligations. However, a county in AL needs state legislature's approval to raise its taxes for the same purpose. Therefore, a GO bond backed by the full faith and credit of government may not provide the same level of protection to investors in every locality. "If you have seen one municipal bond, you have seen one municipal bond" is a popular expression in this market.

[2]The Detroit bankruptcy complicates our argument. Even though the case does not constitute a precedent, Judge Rhodes ruled that municipal GO bonds may be treated as unsecured creditors unless state law provides a statutory lien on tax revenue (as in Rhode Island, for example) or bond documents grant a specific lien upon identifiable and valuable collateral (see the plan of adjustment of the City of Detroit confirmed by Judge Rhodes on November 7, 2014 and his interim rulings). Consequently, the plan of adjustment did not impair Detroit's REVs but imposed a nearly 60 percent haircut on limited-tax GO investors. Fortunately for us, the bankruptcy case was decided after our sample period ends.

[3]Compared to Chapter 11, Chapter 9 is exceptionally issuer-friendly due to the limitations imposed on the federal judiciary by the 11th Amendment.

We should also note that there has been no change in the institutional characteristics of the municipal bond markets that would affect the liquidation or agency costs as reviewed above. If anything, transparency improved with the adoption of GASB Statement 34 in 1999, which suggests less-frequent or smaller premium-coupon usage. What is in GASB 34 that would make premium coupons more attractive despite increased transparency?

GASB Statement 34

On June 30, 1999, Governmental Accounting Standards Board (GASB) issued its Statement 34 establishing new financial reporting requirements for state and local governments, including special-purpose governments such as school districts and public utilities. The goal of the Statement was to increase the information available to the public on a government's fiscal health, make it easy to understand, and standardize the reporting to make information comparable across governments. One novelty, for example, was the addition of a management discussion and analysis section to the annual report similar to corporate reports. The Statement's most significant mandate was the requirement to publish new government-wide financial statements prepared using accrual accounting for all government activities rather than cash-based year-end budget reports. The Statement's requirements were phased in over a four year period, with earliest adoptions occurring within a year.

To understand how the accrual accounting increases the attractiveness of premium coupons, let's imagine a locality operating under a debt ceiling as well as a budget constraint. Technically, premium coupons are attractive to localities facing borrowing constraints because cash receipts at issuance will exceed the face value of the debt subject to the limit. Economically, the premium is just another debt that needs to be paid back in higher coupons, but from a cash-budget perspective (or political perspective), it is extra liquidity that can be spent.[4] As a case in point, on March 1st, 2011, the California Attorney General warned Poway Unified School District for its use of coupons with excessive premiums as a way to incur debt beyond

[4]It was common place for governments to recognize the cash receipts from bond issuance as "revenue" in their budgets. Today, only the premium amount can be recognized as revenue but only to offset the future debt service and the cost of issuance. Since money is fungible, this is tantamount to recognizing premiums as revenue.

what the voters authorized (Saskal, 2011).

The disadvantage of premium coupons is that under cash accounting rules, the higher coupon payments will inflate the spending numbers in the future. In order to see how accrual accounting eases these spending pressures, suppose a municipality issues a premium bond that raises $105 on a par value of $100. On the balance sheet, $100 is the debt and the $5 premium is a liability (Deferred Bond Premiums) that is amortized over time. The amortization of a liability is a negative expense. In other words, the amortized liability reduces the impact of the coupon payment on the bottom-line. Many localities do indeed use the premium as a cash reserve to pay off the early coupons and refund the bond when the reserve runs out.[5] By contrast, if a $100 bond is issued at a discount, say $95, the $5 discount goes into an asset account (Deferred Bond Discounts) that also needs to be amortized. However, the amortized asset will add to the coupon payment as an expense, not reduce it. Amortization of the premiums in the post-GASB 34 world could be the accounting trick that tips the balance in favor of premium bonds. If our hypothesis is correct, we would expect the most cash-strapped issuers to increase their use of premium bonds after the adoption of the new rules.

3 Data and Variable Definitions

The data used in the analysis originates in the Mergent Municipal Bond Securities Database and the Census of Governments (COG). The Mergent database contains bond-characteristic data on 2,678,171 bonds issued from 1992 to 2012.[6] The Mergent issue database groups these bonds into 288,359 issue series and provides the name of the issuer. The Mergent data are merged with the COG data using the issuer name.

[5]When the reserve runs out, it creates the perverse incentive to issue new debt with a new premium coupon and call the old debt. Municipal bonds are known to be called earlier than economically justified (Ang et al., 2013). This game is more difficult to play in a rising rate environment.

[6]There are 262,069 observations dated before 1992, but the annual counts are generally less than half of the post-1992 counts. The pre-1992 observations may only represents a subset of all bonds issued, and the selection into that sample could be correlated with some of the characteristic measures that are key to the analysis.

The COG is collected every five years, and this analysis makes use of the 1992, 1997, 2002, 2007 and 2012 censuses. The COG aims to enumerate every independent county, city, town, special district, and school district in the US. The total number of unique local governments in the five censuses is 98,280. Counts within each year are closer to 70,000 because between each census, some governments are incorporated and others dissolved. The COG observations are categorized into the types listed above. The first step in merging the bond data is to identify the level of government using keyword searches in the bond issuer name string. We then match on names within the state and category. This step links 184,946 of the issues to COG governments. Issues that have not matched within categories are then checked against the counties, cities, and state governments. This results in an additional 96,812 matches. These matches are primarily departments of the independent governments that can be matched using the jurisdiction name. For example, the Cleveland Metroparks is an independent, regional special district, and its bonds would be linked to its record in the COG in the first matching step. Bonds issued by the Cleveland Department of Parks would be linked to the City of Cleveland in the second step.

For the analysis, the individual governments are the unit of observation, so the merged data sets are collapsed to government-year values. We calculate a dollar value of the premium or discount for every bond that is sold at a value other than face value. These figures are summed within a year to arrive at a net premium or discount. The net value is then divided by the annual expenditures from the Census for scaling. If the issuer issued in a year, but used only par value bonds, the value of this measure is equal to zero. If an issuer did not issue within the year, the observation is a censored observation.

Denoting the year of issuance with t, the year of the preceding Census by $T-1$ and the following Census by T, the estimated model is of the form

$$\frac{Net\ Premium_t}{Expenditure_{T-1}} = \alpha + \beta_1 Distress_{T-1,T} + \beta_2 Post + \beta_3 Distress_{T-1,T} * Post$$

$$+\boldsymbol{\beta}(Government\ Type,\ Year\ and\ State\ FE)$$

$Distress_{T-1,T}$ is the change in variables we associate with fiscal stress or budget pressures between the Censuses that surround the issuance. Because data on government finances are not available annually, we have to include observations from the future Census in our estimation. The same $Distress_{T-1,T}$ applies to all issuances of a government body between the two Census years. *Post* is a dummy that takes the value of 1 after 1999. The model also includes issuance year, state and type-of-government fixed effects. Errors are clustered by issuer.

One can derive several indicators of fiscal *health* from the COG. Changes in annual expenditures between Censuses will be used as the main measure. We adjust all the values using the Consumer Price Index, so positive changes will represent real growth. Smaller negative values could represent budgets failing to keep pace with inflation. The most interesting cases would arise when governments are making deep cuts in their budgets, which could motivate elected officials to seek non-traditional sources of revenue. Other measures of fiscal health include changes in intergovernmental transfers, own revenue, and revenue per capita. Revenue per capita cannot be calculated for special districts because the population they are serving is not well defined. A port authority, for example, may have no residents but serve thousands of travelers daily. For school districts, the population figure is the number of students because open enrollment policies in many states make it difficult to define a total population served. In our analysis, *Distress* is measured as the change in the health measure multiplied by -1. That is, a negative change in expenditures would appear as a positive change in *Distress*.

In this analysis, the treatment of interest is an interaction of issuers' fiscal stress with the amended accounting rules. We assume the rule change was an exogenous shock to all issuers, and we proxy for this treatment using a pre-post indicator which switches on in 2000. We regard the other part of the treatment, fiscal stress, as an exogenous shock caused by an erosion of the tax base. While these treatments are assumed to be exogenous, we still

have to address the issue of selection into the sample. Issuers that are financially distressed might desire to issue premium bonds, but be unable to issue anything because they cannot take on further debt service. In the data, the measures of fiscal distress are indeed positively correlated with the probability of issuing any bonds. We do not suggest that governments issue bonds specifically to collect premiums. Rather, when a bond issuance is required to perform the issuer's primary function, it creates an opportunity to collect a premium. If we estimate the relationship between fiscal stress and premium bond issuance without a sample selection correction, it will be biased downward.

To address this sample selection bias, we use a Heckman procedure with the issuer's scale to instrument for issuance in a given year. The assumption is that larger governments are more likely to access the bond market in any year because their funding needs are large enough to justify a bond issuance (instead of a bank loan), independent of their coupon choice. We use the natural logarithm of the salaries expense of the locality as our instrument. We believe this is a cleaner form of scale than any other itemized or aggregate expense category because localities may differ in the types of expenses they incur during the course of business but payroll is common to all.

4 Results

4.1 Descriptive Statistics

Table 1 describes the frequency of issuance, net bond premiums and the shares of the types of governments among the issuers. Issuance of premium bond and bonds in general was higher in the post-2000 period. Figures 1 and 2 present times series of the average net premium for issuers categorized by their fiscal health. By this measure, there is little difference between the behavior of rapidly growing issuers and issuers experiencing moderate real declines. Issuers with strongly declining expenditures follow a distinctly different path. Distressed issuers made greater use of discount bonds in the late 1990s. After 2000, they

made greater use of premium revenue bonds relative to their annual expenditures. Their use of premium general obligation bonds fell during the recession, but climbed above the use by non-distressed issuers again during the recovery.

4.2 Fitted models

The results appear in Table 2. The coefficients are maximum likelihood estimates derived with a Heckman correction for sample selection. After controlling for the probability of issuance and selection into the sample, fiscal distress has a positive and significant coefficient (0.038) in the model of net premium on revenue bonds as a percent of annual expenditures. During the pre-GASB 34 period, the coefficient on the measure of fiscal distress has a negative relationship to the net premiums on revenue bonds realized by the issuers. In the post period, a one standard deviation (29.54) difference in the fiscal health measure would correspond to an additional bond premium of 0.11 percent of annual expenditures.

The contrast between the issuance behavior of fiscally health and potentially distressed local governments could be critical to understating the true impact of the rule change. While making higher cash payments could be a valid signal of creditworthiness among indistinguishable issuers, a change in behavior by all market participants is suggested by the intercept for the post-rule change period (0.79). The *Post* coefficient is 7 time larger the a one standard deviation change in the fiscal health measure is predicted to create. If even one quarter of this difference was due to the rule change rather than market conditions, this would represent a momentous shift.

4.3 Alternate Specifications

The main model contrasts a pre and post periods, but we may wish to know if the relationship between fiscal distress and premium bond usage also exists in the cross section. Table 3 displays the results from four models estimated with a single year's observations. The years selected were the COG years, which should minimize measurement error arising from

interpolations between censuses. The coefficients on the fiscal distress measure for revenue bonds are consistent with the hypothesis that distressed governments disproportionately increased their use of premium bonds following the rule change. However, we have lost statistical significance because the sample size is only one twentieth of the pooled model.

In table 4, the models are estimated using four alternate measures of distress. The first is population changes, with the assumption that governments serving a declining population are more likely to be distressed. Special districts are omitted from the population model because they do not have defined populations. The coefficient in the population model on the direct distress measure and its interaction are exactly offsetting and not significant. The results in the intergovernmental transfer and own-revenue models both appear similar to the main model, especially for REVs, with the interaction of the distress measure and the post indicator having a positive coefficient. The model suggests dollars lost from either source elicits similar responses from the issuers. Because own revenue is larger relative to expenditures, there is more variation in that figure to enable estimation. The revenue per capita model displays a similar pattern in the coefficients of GO bonds, but the coefficient on the interaction term misses significance.

Finally, we have repeated our analysis after removing all bonds with a 5 percent coupon from the sample. A 5 percent coupon is the municipal market standard and is in higher demand than lower coupon offerings. As bond yields dropped in 2000s, these standard coupons provided increasing premium reserves to issuers. After dropping these standard-coupon bonds, Table 5 shows that our results still hold with similar signs and magnitudes.

5 Conclusions

In our paper, we find evidence that fiscally distressed revenue bond issuers collect net bond premiums that equal a larger percentage of their annual expenditures after the release of GASB Statement 34.

We explain this behavior by the removal of the distortions caused by cash accounting. Accrual accounting increases the reported cost of discount bonds by capturing the fact that part of the cost is in the capital appreciation to par. Conversely, the reported cost of premium bonds is reduced by the recognition that investors are paying the issuer more than par.

While our findings are consistent with the economic theories developed in the corporate finance literature, the documented impact of accounting rules on coupon-choice is unique to our study.

Acknowledgements

We are grateful to Ron Cheung for sharing his copies of the Census of Governments micro-data. Tricia Waiwood and Chris Vecchio assisted with the matching efforts.

References

Aghion, P. and P. Bolton (2008). *An Incomplete Contracts Approach to Financial Contracting.*, pp. 410 – 431. Unlisted: Elgar Reference Collection. International Library of Critical Writings in Economics, vol. 232. Cheltenham, U.K. and Northampton, Mass.: Elgar.

Ang, A., R. C. Green, and Y. Xing (2013). Advance refundings of municipal bonds.

Barnea, A., R. A. Haugen, and L. W. Senbet (1980). A rationale for debt maturity structure and call provisions in the agency theoretic framework. *Journal of Finance 35*(5), 1223 – 1234.

Battaglini, M. and S. Coate (2008). A dynamic theory of public spending, taxation, and debt. *American Economic Review 98*(1), 201 – 236.

Carroll, D. A. (2009). Diversifying municipal government revenue structures: Fiscal illusion or instability?. *Public Budgeting and Finance 29*(1), 27 – 48.

Chava, S., P. Kumar, and A. Warga (2010). Managerial agency and bond covenants. *Review of Financial Studies 23*(3), 1120 – 1148.

Dass, N. and M. Massa (2014). The variety of maturities offered by firms and institutional investment in corporate bonds. *Review of Financial Studies 27*(7), 2219 – 2266.

De, S. and J. R. Kale (1993). Contingent payments and debt contracts. *Financial Management 22*(2), 106 – 122.

DeMarzo, P. M. and M. J. Fishman (2007). Optimal long-term financial contracting. *Review of Financial Studies 20*(6), 2079 – 2128.

Flannery, M. J. (1986). Asymmetric information and risky debt maturity choice. *Journal of Finance 41*(1), 19 – 37.

Galil, K., O. M. Shapir, D. Amiram, and U. Ben-Zion (2014). The determinants of cds spreads. *Journal of Banking and Finance 41*, 271 – 282.

Hackbarth, D., J. Miao, and E. Morellec (2006). Capital structure, credit risk, and macroeconomic conditions. *Journal of Financial Economics 82*(3), 519 – 550.

Hart, O. and J. Moore (1998). Default and renegotiation: A dynamic model of debt. *Quarterly Journal of Economics 113*(1), 1 – 41.

He, Z. and W. Xiong (2012). Rollover risk and credit risk. *Journal of Finance 67*(2), 391 – 429.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review 76*(2), 323 – 329.

Klomp, J. and J. de Haan (2013). Political budget cycles and election outcomes. *Public Choice 157*(1-2), 245 – 267.

Leland, H. E. (1994). Corporate debt value, bond covenants, and optimal capital structure. *Journal of Finance 49*(4), 1213 – 1252.

Matsen, E. and O. Thogersen (2010). Habit formation, strategic extremism, and debt policy. *Public Choice 145*(1-2), 165 – 180.

Saskal, R. (2011). California schools on notice. *Investment Dealers' Digest 77*(10), 9 – 12.

Song, Z., K. Storesletten, and F. Zilibotti (2012). Rotten parents and disciplined children: A politico-economic theory of public expenditure and debt. *Econometrica 80*(6), 2785 – 2803.

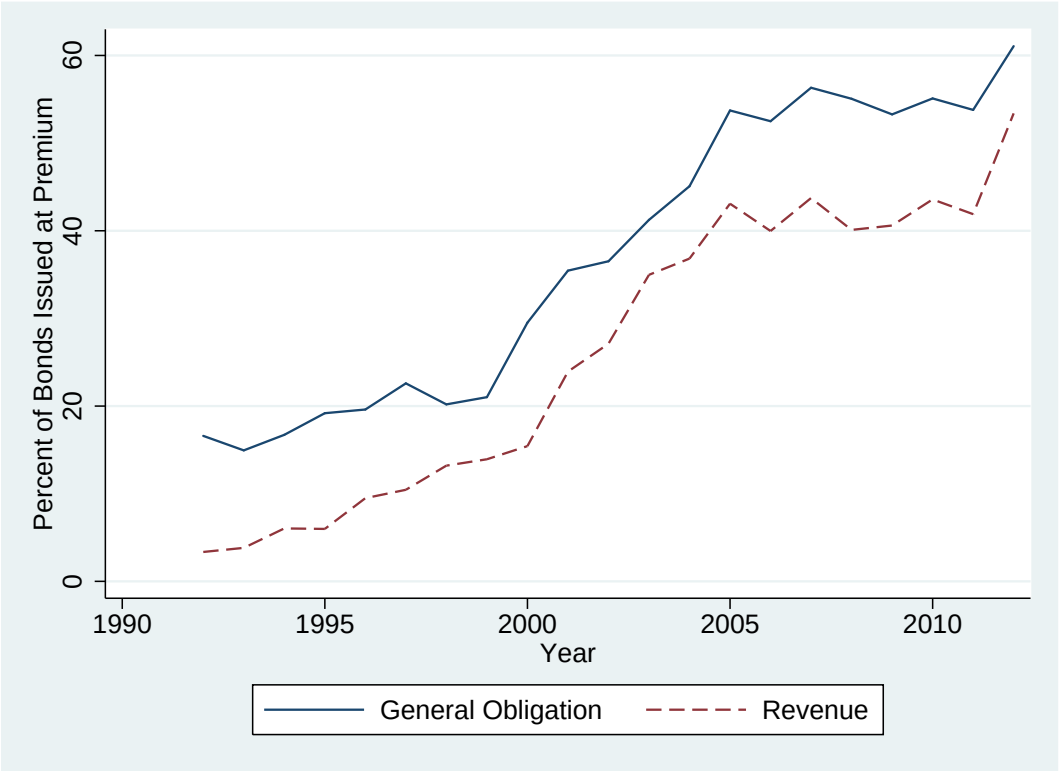

Figure 1: Percent of municipal bonds, by type, which were issued as premium bonds. Source: Mergent Municipal Bond Securities Database.

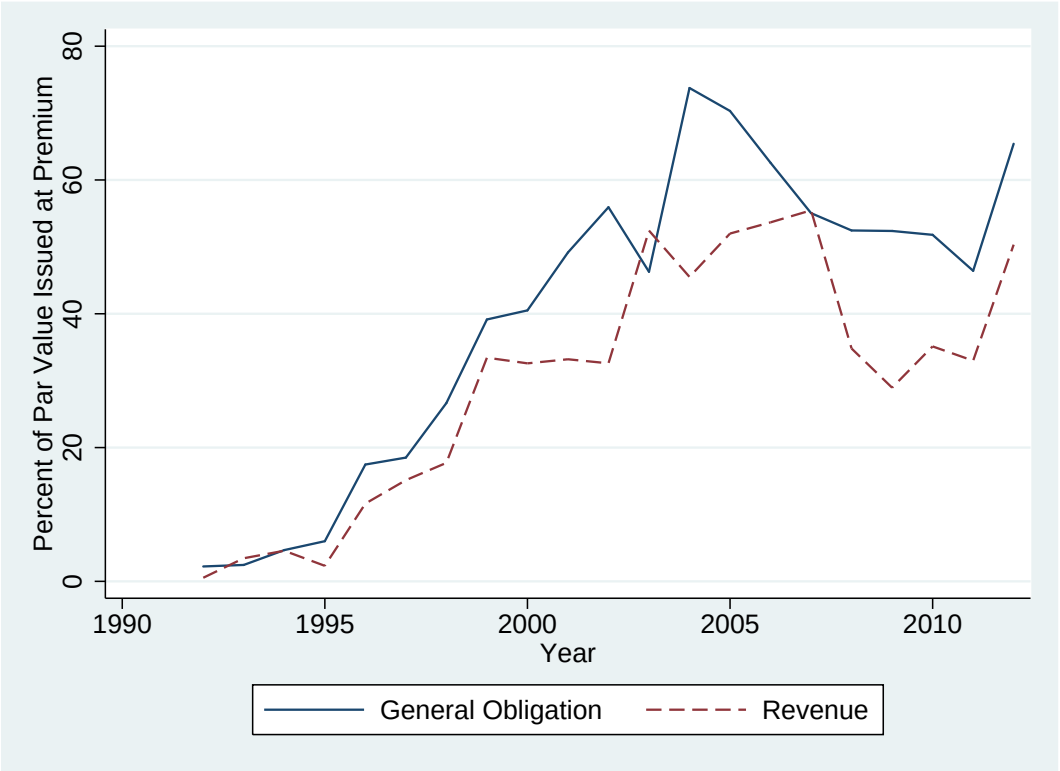

Figure 2: Percent of the par value that was issued using premium bonds, by municipal bond type. Source: Mergent Municipal Bond Securities Database.

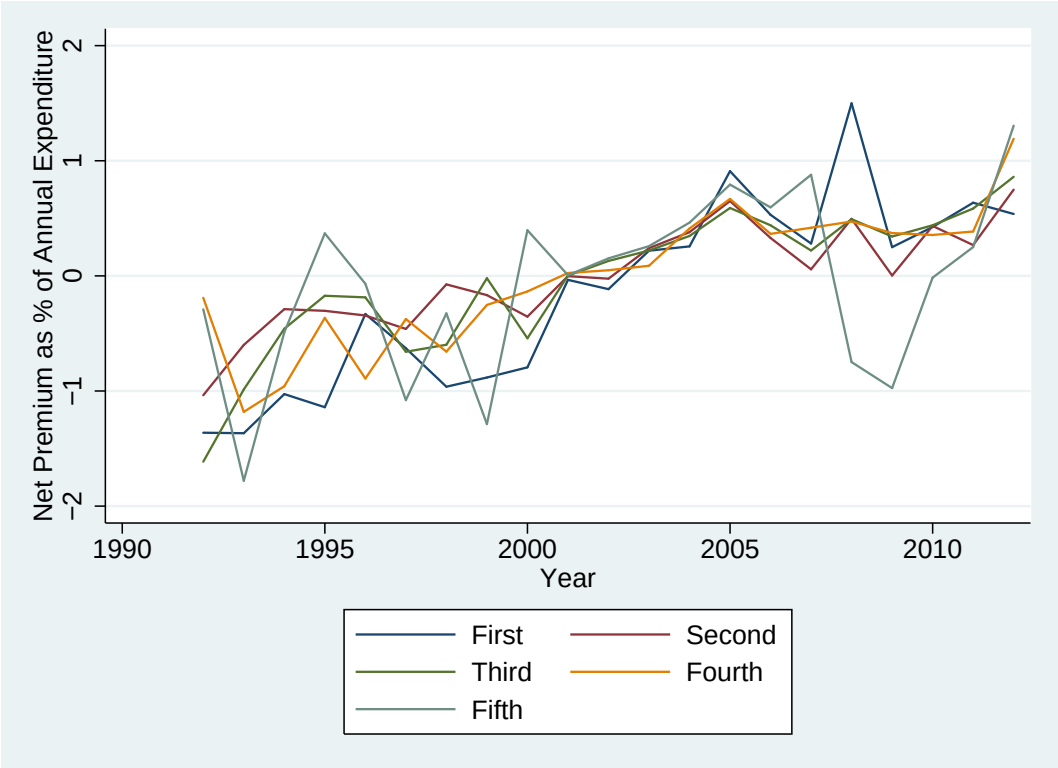

Figure 3: Net general obligation bond premiums as a percent of annual expenditures by quintile of fiscal distress. Fiscal distress is measured by real changes in expenditures between the Census of Governments rounds. Data are from the Census of Governments and the Mergent Municipal Bond Securities Database.

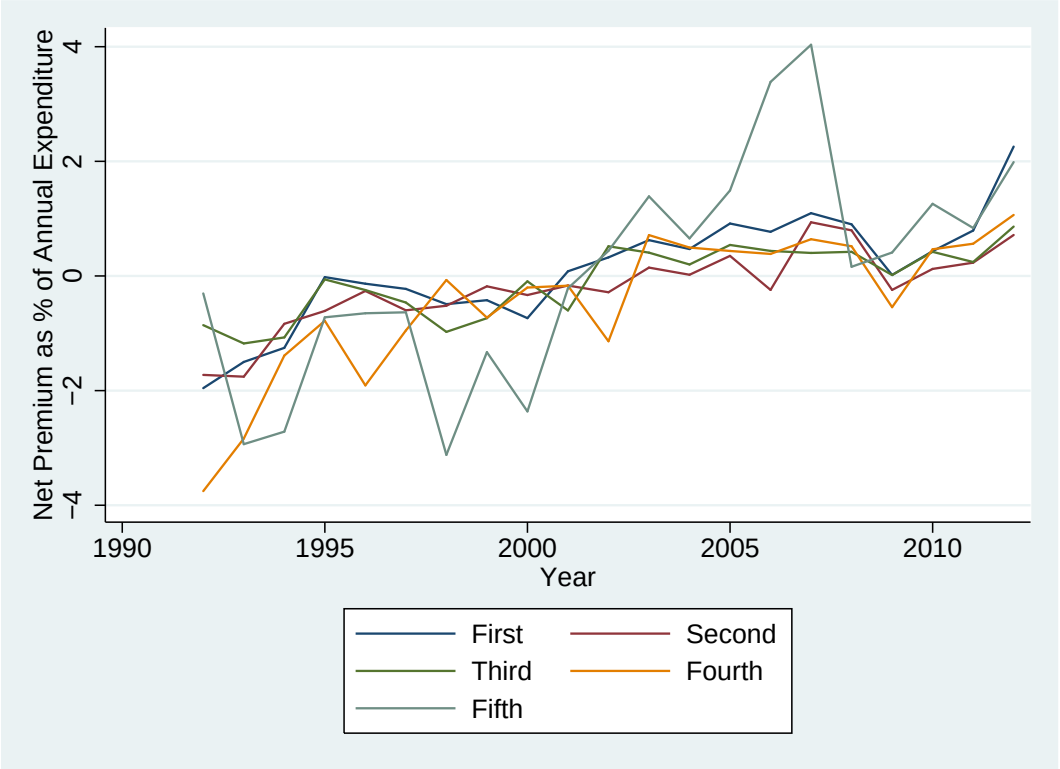

Figure 4: Net revenue bond premiums as a percent of annual expenditures by quintile of fiscal distress. Fiscal distress is measured by real changes in expenditures between the Census of Governments rounds. Data are from the Census of Governments and the Mergent Municipal Bond Securities Database.

Table 1: Descriptive Statistics. Data are from the Census of Governments and the Mergent Municipal Bond Securities Database.

Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**	**N**
Issuance - bonds observed for issuer-year	0.08	0.27	0	1	1,216,543
Net Premium / Annual Expenditure	0.04	5.31	-98.63	99.76	92,623
Distress	-14.49	29.54	-99.98	99.98	92,623
State	0.01	0.11	0	1	91,073
County	0.15	0.35	0	1	91,073
City	0.36	0.48	0	1	91,073
Town	0.06	0.24	0	1	91,073
Special District	0.08	0.27	0	1	91,073
School District	0.35	0.48	0	1	91,073
Log of Debt Outstanding	9.80	2.61	0	18.85	92,623
Log of Salaries	9.22	2.14	0	17.22	92,623

Variable	Pooled		General Obligation		Revenue	
Distress	−0.0013	−0.0038**	−0.0004	0.0021	−0.0019	−0.0109***
	(0.0009)	(0.0016)	(0.0010)	(0.0019)	(0.0019)	(0.0030)
*Distress * Post*		0.0038**		−0.0032		0.0148***
		(0.0019)		(0.0020)		(0.0040)
Post		0.7905***		0.7121**		1.5889***
		(0.2380)		(0.3347)		(0.4274)
County	−0.0406	−0.0413	−0.0972**	−0.0947**	−0.0060	−0.0203
	(0.0410)	(0.0410)	(0.0447)	(0.0447)	(0.0619)	(0.0620)
Town	0.0201	0.0179	0.0319	0.0334	−0.1707	−0.1950
	(0.0882)	(0.0882)	(0.0899)	(0.0900)	(0.2725)	(0.2719)
Special District	0.2684*	0.2773*	0.9763***	0.9647***	0.3840*	0.4129**
	(0.1597)	(0.1601)	(0.2870)	(0.2870)	(0.1960)	(0.1967)
School District	−0.2079***	−0.2161***	−0.2501***	−0.2450***	−0.3059**	−0.3258**
	(0.0587)	(0.0589)	(0.0654)	(0.0653)	(0.1345)	(0.1349)
Log Debt Outstanding	−0.0102	−0.0088	−0.0562**	−0.0559**	0.0588	0.0621
	(0.0210)	(0.0209)	(0.0238)	(0.0237)	(0.0412)	(0.0410)
Constant	−0.7237**	−1.3426***	−0.1012	−0.7029	−2.1976***	−3.3690***
	(0.3061)	(0.3718)	(0.3299)	(0.4497)	(0.8361)	(0.9372)
			First Stage: Issuance			
Distress	−0.0017***	−0.0017***	−0.0023***	−0.0022***	−0.0007***	−0.0006***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Post		0.6449***		0.7065***		0.4568***
		(0.0187)		(0.0242)		(0.0268)
County	0.0426**	0.0430**	0.0481**	0.0485**	−0.1318***	−0.1319***
	(0.0168)	(0.0168)	(0.0196)	(0.0197)	(0.0200)	(0.0201)
Town	−0.2873***	−0.2895***	−0.2142***	−0.2163***	−0.3025***	−0.3035***
	(0.0159)	(0.0159)	(0.0175)	(0.0175)	(0.0315)	(0.0316)
Special District	−0.2260***	−0.2269***	−0.6390***	−0.6405***	0.1127***	0.1124***
	(0.0152)	(0.0153)	(0.0243)	(0.0243)	(0.0177)	(0.0177)
School District	−0.4381***	−0.4416***	−0.2275***	−0.2306***	−0.7796***	−0.7822***
	(0.0117)	(0.0117)	(0.0129)	(0.0129)	(0.0180)	(0.0180)
Log Debt Outstanding	0.1598***	0.1596***	0.1521***	0.1515***	0.1296***	0.1295***
	(0.0032)	(0.0032)	(0.0040)	(0.0040)	(0.0043)	(0.0043)
Log Salaries	0.1760***	0.1765***	0.1672***	0.1680***	0.1610***	0.1611***
	(0.0045)	(0.0046)	(0.0054)	(0.0054)	(0.0061)	(0.0061)
Constant	−4.1604***	−4.5685***	−4.3260***	−4.7968***	−4.3982***	−4.6830***
	(0.0300)	(0.0336)	(0.0336)	(0.0394)	(0.0476)	(0.0517)
N	1,197,821	1,197,821	1,198,125	1,198,125	1,198,071	1,198,071
Uncensored Obs.	91,073	91,073	62,834	62,834	26,233	26,233

Table 2: Net bond premiums as a percentage of annual expenditures. Fiscal distress is measured by the real budget cuts observed between rounds of the Census of Governments. *Post* indicates years after the change in GASB rule 34. All models include state and year fixed effects. The models are estimated using maximum likelihood and a Heckman correction for sample selection. Local governments that issue bonds within a year are selected into the sample. The log of annual expenditures on salaries is used to predict selection into the sample, and it is excluded from the second stage regression. Standard errors are clustered by issuer. Data are from the Census of Governments and the Mergent Municipal Bond Securities Database. Significance key: *** p<0.01, ** p<0.05, * p<0.1.

	1997	2002	2007	2012
Pooled				
Distress	0.009 ∗ ∗	0.001	−0.011 ∗ ∗	0.008∗∗∗
	(0.004)	(0.004)	(0.005)	(0.003)
N	64,090	57,139	51,659	53,851
Uncensored Obs.	3,643	5,241	5,001	5,603
General Obligation				
Distress	0.015∗∗∗	0.002	−0.000	0.009∗∗∗
	(0.005)	(0.004)	(0.003)	(0.003)
N	64,104	57,155	51,679	53,869
Uncensored Obs.	2,100	3,775	3,622	4,396
Revenue				
Distress	−0.004	−0.000	−0.012	0.002
	(0.005)	(0.009)	(0.009)	(0.005)
N	64,104	57,152	51,673	53,861
Uncensored Obs.	1,233	1,475	1,321	1,229

Table 3: Cross-sectional model of net bond premiums as a percentage of annual expenditures in the COG years. All models include the log of debt outstanding and government type, state and year fixed effects. The models are estimated using maximum likelihood and a Heckman correction for sample selection. Fiscal distress is measured by the real budget cuts observed between rounds of the Census of Governments. Local governments that issue bonds within a year are selected into the sample. The log of annual expenditures on salaries is used to predict selection into the sample, and it is excluded from the second stage regression. Standard errors are clustered by issuer. Data are from the Census of Governments and the Mergent Municipal Bond Securities Database. Significance key: *** p<0.01, ** p<0.05, * p<0.1.

	Population	Intergovernmental	Own Revenue	Revenue Per Capita
Pooled				
Distress	0.007 ∗ ∗	−0.001	−0.007∗∗∗	−0.003∗∗∗
	(0.004)	(0.003)	(0.002)	(0.001)
Distress ∗ *Post*	−0.007∗	−0.002	0.008∗∗∗	0.003∗
	(0.004)	(0.003)	(0.003)	(0.001)
Post	0.616∗∗∗	0.610 ∗ ∗	0.844∗∗∗	0.679∗∗∗
	(0.200)	(0.240)	(0.236)	(0.207)
N	688,782	1,073,602	1,181,420	692,777
Uncensored Obs.	56,393	89,180	90,517	56,541
General Obligation				
Distress	0.011∗	0.013∗∗∗	−0.008∗∗∗	−0.002
	(0.006)	(0.003)	(0.003)	(0.002)
Distress ∗ *Post*	−0.011∗	−0.016∗∗∗	0.011∗∗∗	0.001
	(0.006)	(0.004)	(0.003)	(0.002)
Post	0.546∗	0.626∗	0.887∗∗∗	0.622∗
	(0.326)	(0.346)	(0.334)	(0.335)
N	689,099	1,074,252	1,182,204	693,094
Uncensored Obs.	37,387	62,419	62,614	37,473
Revenue				
Distress	0.008 ∗ ∗	−0.013∗∗∗	−0.007 ∗ ∗	−0.002
	(0.003)	(0.005)	(0.003)	(0.001)
Distress ∗ *Post*	0.001	0.016∗∗∗	0.007	0.001
	(0.004)	(0.006)	(0.004)	(0.002)
Post	−1.742∗∗∗	1.140∗∗∗	1.494∗∗∗	−1.712∗∗∗
	(0.329)	(0.414)	(0.417)	(0.327)
N	688,905	1,074,068	1,181,953	692,901
Uncensored Obs.	17,671	25,048	25,994	17,724

Table 4: Model of net bond premiums as a percentage of annual expenditures, with alternate measure of fiscal distress. All models include state and year fixed effects. The models are estimated using maximum likelihood and a Heckman correction for sample selection. Fiscal distress is measured by the real changes observed between rounds of the Census of Governments. *Post* indicates years after the change in GASB rule 34. Local governments that issue bonds within a year are selected into the sample. The log of annual expenditures on salaries is used to predict selection into the sample, and it is excluded from the second stage regression. Standard errors are clustered by issuer. Data are from the Census of Governments and the Mergent Municipal Bond Securities Database. Significance key: *** p<0.01, ** p<0.05, * p<0.1.

	Pooled	General Obligation	Revenue
Distress	−0.0024	0.0019	−0.0086***
	(0.0015)	(0.0019)	(0.0028)
Distress ∗ *Post*	0.0027	−0.0026	0.0123***
	(0.0018)	(0.0019)	(0.0036)
Post	0.7367***	0.6373*	1.4389***
	(0.2366)	(0.3345)	(0.4251)
N	1,197,886	1,198,141	1,198,110
Uncensored Obs.	91,138	62,850	26,272

Table 5: Models of net bond premiums as a percentage of annual expenditures excluding 5-percent-coupon bonds. All models include state and year fixed effects. The models are estimated using maximum likelihood and a Heckman correction for sample selection. Fiscal distress is measured by the real budget cuts observed between rounds of the Census of Governments. Local governments that issue bonds within a year are selected into the sample. The log of annual expenditures on salaries is used to predict selection into the sample, and it is excluded from the second stage regression. Standard errors are clustered by issuer. Data are from the Census of Governments and the Mergent Municipal Bond Securities Database. Significance key: *** p<0.01, ** p<0.05, * p<0.1.