

AN INTRODUCTION TO THE U.S. MUNICIPAL BOND MARKET

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Abstract

With a market value exceeding \$2.6 trillion, the U.S. municipal securities market offers state and local governments many capital investment-financing opportunities. Many readers, however, may lack an understanding of the issuance process, the quality of the available information, or the inherent risks associated with these instruments. We describe the traditional municipal bonds process beginning with the initial offering preparations and the methods of sale. We discuss the types of interest costs and the use of the bond proceeds. We identify typical bond types and call provisions. We then turn to a discussion of the investment characteristics of municipal bonds. We explain credit ratings, credit enhancements, potential risks, and oversight and reporting. Our discussion is supplemented with data from the municipal bond market from 2001-2007. Our paper provides the reader with a basic understanding of the institutional structure, available information, and potential risks for this economically significant market.

An Introduction to the U.S. Municipal Bond Market

Introduction

While American equities enjoy nearly nonstop attention, worldwide, municipal securities in the United States have received far less attention than one might expect of a \$2.6 trillion market. Indeed, many readers – particularly those outside the U.S. – may have little knowledge of municipal securities. This paper provides an introduction to state and local governmental borrowing in the primary market, which deals with new bond issues, rather than the secondary market, which deals with transactions in already outstanding bond issues. We hope to stimulate interest in both academic and institutional research in this area by providing the reader with an understanding of the basic structure and available data for the municipal bond market.

Preparing the Bond Offering

When a governmental or municipal entity needs to borrow money, the first step in that process is to hire a financial advisor. A financial advisor conducts an in-depth assessment of the issuer's financial capacity and offers options for addressing its borrowing needs. If the entity decides to tap the capital markets for funds, the financial advisor makes recommendations as to the particular type of debt to issue, its method of issue, and any features that will enhance marketability or risk management. We discuss each of these aspects later in the paper. In addition, if voter approval is necessary to issue debt, the advisor may help the entity strategize for passage of public bond measures.

After many of the specifics of the bond offering are finalized, the financial advisor then begins the marketing efforts for the bond sale. The most important instrument for this purpose is the official statement (OS). The official statement is the public sector counterpart to the private sector prospectus, and contains detailed information on the securities to be offered. Although OS content and quality will vary according to state laws and the financial advisor's diligence, it will typically list various geographic, economic, legal, and financial details about the issuer. It will also contain (1) the purpose for issuing the bonds, (2) the revenue sources pledged for debt service, (3) the bond counsel's opinion as to the tax status of the bonds, (4) the dates and amounts of the maturity payouts – along with applicable call price information, (5) the bonds' credit rating(s), and (6) credit enhancement provisions such as bond insurance or state aid funds. Financial statements are the perhaps the most important content within the OS, and may range from selected audited statements to the entire comprehensive annual financial report (CAFR). The CAFR contains a full set of financial and auditor statements, plus various other components such as management discussion and analysis and statistical tables.

Methods of Sale

After the financial advisor compiles the official statement, he or she may advertise in the professional media the intention to solicit bids or proposals from underwriters. Underwriters actually purchase the bond issue for subsequent placement or distribution among investors interested in buying the bonds. Public bond sales typically involve either a competitive or a negotiated arrangement. In a competitive bid, inquiring underwriters are given the OS, the date and time of the bid, and the bid parameters such as the basis for awarding the bid (usually the lowest interest cost of the issue), coupon limitations, and premium or discount limitations. The advisor then administers the bidding process, confers with the issuer about the bids received, and announces the underwriters with the winning bid. If the bond issue is a negotiated deal instead of a competitive bid, the financial advisor will oversee the negotiation process on behalf of the bond issuer. Negotiated deals are often preferred to competitive bids during periods of volatility or if the bond issue is large and complex. Negotiated issues are also controversial. Research

studies generally find that negotiated issues increase the interest cost on the bonds compared to competitive bids, and leading professional organizations, such as the Government Finance Officers Association (GFOA), recommend against their use, preferring instead competitive bids. A third type of bond sale, the private placement, is directly placed with an investor and does not involve any public underwriting or resale. It is used less frequently than the other methods. As can be seen in Table 1, bond placement is dominated by negotiated deals.

Table 1

**Municipal Issuance
Long-Term Competitive, Negotiated & Private Placement**

(\$ Billion)

Year	Competitive	Negotiated	Private Placement	Total
2001	63.1	221.5	3.1	287.7
2002	71.8	283.0	2.7	357.5
2003	75.8	303.0	3.9	382.7
2004	68.8	288.1	2.9	359.8
2005	76.1	330.3	1.8	408.2
2006	69.6	312.5	4.4	386.5
2007	72.7	351.7	4.6	429.0

Source: Thomson Financial Securities Data (available on the Securities Industry and Financial Markets

Just as financial advisors are mediators for bond issuers, so too are underwriters mediators for bond investors – albeit less formally. As part of the sales process, underwriters confer with their clients – both individual and institutional investors – to determine how the prospective bond issue structure may satisfy their portfolio needs and preferences. The bond issue is then priced accordingly, subject to the bid parameters established by the bond issuer and the hoped-for underwriter’s spread, or gross profit. Very often, several underwriting firms may enter into a partnership – known as a syndicate – to bid collectively on a particular bond issue. For this purpose, one firm is selected as the lead manager along with one or more co-managers from other firms in the syndicate. The lead manager is responsible for bid compliance, calculation, and submission.

Use of Bond Proceeds

Municipal bond proceeds are used for a variety of purposes that are stipulated in the bond's official statement, and must be used for those stated purposes. New bond issues can generally be classified as a new financing (i.e., new capital), a refunding, or a combination of new financing and refunding. A new financing applies bond proceeds to capital projects or special uses not adequately covered by normal funding during the fiscal year(s), such as facilities construction or resource maintenance. In contrast, a refunding issue provides the issuer with funds to refinance other bonds. Typically, the proceeds from the refunding bond issue are invested into an escrow account that pledges or dedicates the monies to service or pay off other outstanding debt. Why issue new bonds to service existing bonds? Wood (2008) lists three types of refunding reasons. The first is to "call" or buy back an outstanding bond issue if interest cost savings can be realized. If a bond contains a call option, the bond issuer can buy back the bond from bondholders during a certain "call period" (prior to the maturity date) and at a certain price, both specified in the OS. Secondly, the bond issuer may want to restructure debt repayments – usually by lengthening the payback period – in an attempt to reduce the overall cost of debt. The third reason involves "defeasing" or changing legal restrictions on an outstanding bond. The bond issuer can use the refunding proceeds to establish an account of dedicated investment securities, a defeasance escrow, to service the outstanding bonds. If the bond's defeasance provisions are satisfied, the issuer may alter its legal restrictions concerning funding sources, debt limitations, and so on.

Thus, unlike new financings, which are concerned with construction and maintenance of infrastructure, refundings are refinancings of outstanding bonds. As can be seen from Table 2, most new bond issues are for new financings.

Table 2

**Municipal Issuance
Long-Term New Capital & Refunding**

(\$ Billion)

Year	New Capital	Refunding	Total
2001	197.2	90.5	287.7
2002	236.9	120.6	357.5
2003	262.2	120.5	382.7
2004	229.1	130.7	359.8
2005	222.3	185.9	408.2
2006	256.0	130.5	386.5
2007	274.5	154.6	429.1

Source: Thomson Financial Securities Data (available on the Securities Industry and Financial Markets)

Bond Types

Long-term securities – those with a final maturity in excess of thirteen months – are generally deemed to be bonds. The two most common types of bonds are general obligations (GO) and revenue bonds. Revenue bonds commit certain specified (and therefore limited) revenue sources to support principal and interest payments. Accordingly, they usually contain several restrictive covenants. Due to the limited scope of cash inflows associated with revenue bonds, investors regard such investments as risky relative to GOs. General obligation bonds, in contrast to revenue bonds, provide broader debt service support by committing the issuer’s general taxing authority to support principal and interest payment obligations. Overall, more revenue bonds are issued than general obligation bonds. See Table 3 for a comparison.

Table 3

Municipal Long-Term General Obligation & Revenue Issuance

(\$ Billion)

Year	General Obligation	Revenue	Total
2001	101.7	186.0	287.7
2002	125.7	231.8	357.5
2003	142.1	240.6	382.7
2004	129.6	230.1	359.7
2005	144.2	264.0	408.2
2006	114.8	272.0	386.8
2007	131.1	293.2	424.3

Source: Thomson Financial Securities Data (available on the Securities Industry and Financial Markets)

It should also be pointed out that GOs are most often issued in serial form and revenue bonds are often issued as term bonds. Term bonds have only a single payout maturity at one specific future date. Serial bond issues have staggered maturity payouts with their own individual coupons and prices.

Securities with final maturities of thirteen months or less are generally deemed to be notes. Some short-term securities known as anticipation notes are considered bridge financings used to ease cash shortages, and are secured by anticipated funding sources such as bonds and tax revenues. These are known respectively as bond anticipation notes (BANs) and tax revenue anticipation notes (TRANs). As Table 4 illustrates, long-term securities outstrip short-term issuances.

Table 4**Municipal Issuance, Short-Term and Long-Term Maturities***(\$ Billion)*

Year	Short-Term	Long-Term	Total
2001	56.6	287.7	344.3
2002	72.4	357.5	429.9
2003	69.8	382.7	452.5
2004	57.0	359.8	416.8
2005	50.5	408.2	458.7
2006	44.0	386.5	430.5
2007	58.0	429.0	487.0

Source: Thomson Financial Securities Data (available on the Securities Industry and Financial Markets Association's website)

Types of Interest Costs

Because municipal bonds are generally exempt from federal taxation, investors do not demand as high a yield as comparable taxable bonds. Despite this advantage when competing for capital, state and local governments should seek to minimize their borrowing costs. Historically, the most common interest cost calculation used by issuers for awarding bids is the net interest cost, or NIC. The NIC is "the average annual cost to borrow, expressed as a percent per year" and is calculated by taking the total interest paid over the life of the bond, plus or minus the amount of any discount or premium, respectively, and dividing the total net interest amount by the total number of bond years (Zipf, 1995). Bond years are calculated by multiplying each serial maturity amount by the number of years to maturity.

For example, assume a bond issue consists of serial maturities paying \$100,000 over each of the next three years. The first maturity occurs in one year and has a coupon rate of 6.00%, paid semiannually. The second and third maturities occur in two and three years, respectively, and have a coupon rate of 4.00%, paid semiannually. Assume further that after subtracting out its gross profit and assessing prevailing interest rates in the municipal bond market, the underwriter offers to buy the bond issue for \$298,000 instead of the face

Payment Period (every 6 months)	Year	Payment	Present Value Factor	Present Value of Payment
1	0.5	7,000	0.977039570	6,839.28
2	1	107,000	0.954606322	102,142.88
3	1.5	4,000	0.932688150	3,730.75
4	2	104,000	0.911273229	94,772.42
5	2.5	2,000	0.890350004	1,780.70
6	3	102,000	0.869907185	<u>88,730.53</u>

Total Present Value of All Payments = \$297,996.56

TIC rate equating bond payments to bond proceeds received = **4.70%**

$$\text{Present Value Factor} = [1/(1 + (\text{TIC}/2))]^{\text{Payment Period}}$$

While NIC has been the most customary measure of interest cost used by the U.S. market, it has also been widely criticized as an inaccurate shorthand calculation, since it does not consider present value. Underwriters frequently “frontload,” or invert, coupon payout structures on serial bonds by establishing higher coupon rates on the shorter maturities and lower rates on the longer maturities. Such a structure is intended to lower the mathematically calculated NIC for the issue.

An increasingly popular interest cost alternative among market participants – and researchers – is the true interest cost, or TIC. The TIC is an annual interest rate, which equates all of a bond’s payments to the bid price of the issue (i.e., the purchase price of the entire bond issue offered by the underwriter after adjusting for gross profit and any discount or premium). In common usage, the TIC is the same calculation as the internal rate of return, or IRR, except from the issuer’s point of view instead of the investor’s. Theoretically, the TIC is a more appropriate cost measure, since it incorporates present value discounting into its computation, and is arrived at using a search algorithm called successive approximations (Zipf, 1995). The interest rate that most closely matches the sum of discounted cash flows with the value of the bond proceeds is the TIC. This approximation method normally results in a small rounding error, depending upon the number of decimal places used in the calculation. Most electronic spreadsheets have some type of IRR function that easily approximates the TIC. Based on the example above, Exhibit 1 illustrates the discounting of cash flows using a TIC rate given by the IRR function of an electronic spreadsheet. Notice that the TIC of 4.70% does not precisely match the discounted cash flows of \$297,996.56 with the bond proceeds of \$298,000.

However, due to their composite nature, both NIC and TIC have been determined to be imperfect measures of cost. Cook (1982) stresses the fact that many, if not most, bond issues are serial issues comprised of two or more individual bonds with staggered maturities. These individual bonds can vary in several respects, including maturity amount, maturity date, coupon, credit rating, price, and call features. As aggregate interest cost measures, neither NIC nor TIC captures these idiosyncrasies.

Call Provisions

Most municipal bonds contain embedded call options that allow issuers to buy back outstanding obligations from bondholders at specific prices and dates. The ability to call a particular bond issue before its maturity date can be quite valuable to any bond issuer when prevailing interest rates are low relative to the coupon rates on the outstanding bonds, although it can represent a risk for the investor for the same reason. Hence, interest costs are higher for callable bonds. The risks associated with calls are discussed later. Refer to Table 5 for a comparison of callable and non-callable bonds.

Table 5

Municipal Bond Issuance¹ -- Callable vs. Non-Callable

(\$ Billion)

Year	Callable	Non-callable	Total
2001	227.2	60.5	287.7
2002	283.0	74.5	357.5
2003	267.8	114.9	382.7
2004	283.7	76.2	359.9
2005	341.0	67.2	408.2
2006	342.6	43.9	386.5
2007	390.1	39.0	429.1

¹ Excludes maturities of 13 months or less.

Source: Thomson Financial Securities Data (available on the Securities Industry and Financial Markets Association's website)

Credit Ratings

One of the most important aspects of the bond issuer is its credit worthiness – that is, the ability to reliably service obligations to bondholders. The higher its credit rating, the lower its interest cost on bonds. For a fee, one or more of the three national credit rating agencies, Moody’s, Standard & Poor’s, or Fitch, will conduct a credit analysis of the bond issuer and assess a credit rating for the bonds. Despite some differences in methodological philosophies and standards, the ratings of all three companies are fairly analogous. See Figure 1 for Moody’s and Standard & Poor’s ratings definitions. Furthermore, the rating ranges fall into two broad categories of non-defaulted debt: investment grade and speculative. Investment grade securities have a rating in the Baa/BBB categories or higher. Speculative grade securities fall below the investment grade minimum ratings. Rating philosophies and standards notwithstanding, a credit rating is essentially an assessment of a bond issuer’s future debt servicing abilities and therefore, a measure of default risk.

Figure 1

Moody’s and Standard & Poor’s Rating Definitions

Moody’s

Rating	Definition
Aaa	Best quality; carry the smallest degree of investment risk.
Aa	High quality; margins of protection not quite as large as the Aaa bonds.
A	Upper medium grade; security adequate but could be susceptible to impairment
Baa	Medium grade; neither highly protected nor poorly secured – lack outstanding investment characteristics and sensitive to changes in economic circumstances.
Ba	Speculative; protection is very moderate.
B	Not desirable investment; sensitive to day-to-day economic circumstances.
Caa	Poor standing; may be in default but with a workout plan.
Ca	Highly speculative; may be in default with nominal workout plan.
C	Hopelessly in default.

Note: Moody’s applies modifiers for ratings Aa to B. The modifiers 1, 2, and 3 signify a higher, midrank, and lower ranking, respectively, within the rating category.

Standard & Poor's

Rating	Definition
AAA	Highest rating; extremely strong security.
AA	Very strong security; differs from AAA in only a small degree.
A	Strong capacity but more susceptible to adverse economic effects than above two categories.
BBB	Adequate capacity but adverse economic conditions more likely to weaken capacity.
BB	Lowest degree of speculation; risk exposure.
B	Speculative; risk exposure.
CCC	Speculative; major risk exposure.
CC	Highest degree of speculation; major risk exposure.
C	No interest being paid.
D	Bonds in default with interest and/or repayment of principal in arrears.

Note: Standard & Poor's applies modifiers for ratings AA to CCC. The modifiers plus (+) or minus (-) signify a higher and lower ranking, respectively, within the rating category.

Source: Fabozzi, Fabozzi, and Feldstein (1995)

Credit Enhancements

Enhancing credit quality raises the credit rating of bonds and results in lower overall interest costs due to a lowered default risk. One way of improving the credit rating of an issuer's bonds is to purchase bond insurance. Bond or financial guarantee insurance ensures that bondholders will receive all of their principal and interest payments in the event of a default by the issuer. Credit rating agencies will substitute their assessed credit rating of the presumably higher-rated insurance company for that of the issuer. Most bond insurers enjoy the highest credit rating (Aaa or AAA).

Another guarantee mechanism is the state-aid or credit enhancement fund. Credit enhancement funds are created for offering credit support to local government debt, particularly school district bonds. While fund provisions and eligibility requirements vary from state to state, credit enhancement funds are intended to cover debt service payments on behalf of entities that are in danger of defaulting on their bonds. Bonds supported by these funds may experience a credit rating boost and a reduction in interest costs. Figure 2 lists examples of credit enhancement funds, the funds' credit ratings from Standard and Poor's, and the type of enhancement.

Figure 2

Examples of Credit Enhancement Fund Programs

State	Debt type covered	Rating	Enhancement
California	Eligible city and county bonds	A	Motor vehicle license fee and leases
California	Eligible health care bonds	A+	Construction Loan Insurance Fund
Colorado	Local school bonds	AA-	State aid withholding law
Texas	Approved local school bonds	AAA	Constitutional Permanent School Fund
Texas	Higher education bonds	AA	Direct and continuing state appropriations
Virginia	All local G.O. debt	A	State aid withholding law

Source: Standard & Poor’s Public Finance Criteria 2007

Risks Associated with Municipal Bonds

Fabozzi, Fabozzi, and Feldstein (1995) discuss seven risks that holders of municipal bonds face. These are: (1) default or credit risk, (2) interest rate risk, (3) reinvestment risk, (4) call risk, (5) volatility risk, (6) tax risk, and (7) inflation risk.

Default risk is perhaps the most serious risk posed by municipal bonds and pertains to the possibility that the bond issuer may default on payment. Depending on the severity of the financial situation, investors stand to lose some or all of their investment – unless the securities are insured. To address these concerns, bond issuers usually recruit the services of credit rating agencies to assess the credit risk of their bonds. Risks associated with interest rates, reinvestment, calls, and volatility are all related to the level of interest rates in the market. Given the inverse price and yield relationship of fixed-income securities, a relative rise in interest rates will cause the price of a bond to fall.

If investors must sell their bonds during a rise in interest rates, they will suffer a loss in the bond price. This is known as interest rate risk (if the bond is held to maturity, interest rate risk is not a consideration). If interest rates fall relative to the original yield investors are receiving on a bond, interest and principal payments received on the bond must be reinvested at a lower yield. This is known as reinvestment risk.

Another risk associated with lower market interest rates is call risk: bond issuers may realize substantial interest cost savings by exercising any call options attached to their

outstanding bonds and reissuing debt at the lower prevailing market rates. While call prices are often offered at a premium, the amounts received may not adequately compensate investors who must reinvest in the lower interest rate environment. Call risk premiums are therefore commonly impounded into the interest rates demanded by investors. To the extent that rapid increases and decreases in interest rates inject uncertainty into bond values – especially bonds with embedded call options – investors experience volatility risk.

Inflation and taxes are factors that also affect bond investments. Inflation risk gages the unanticipated loss of purchasing power from cash flows due to an inadequate inflation premium on the investment's yield. Tax risk can be twofold: (1) reductions in the top federal marginal tax rates may diminish the attractiveness of tax-exempt securities and result in lower market values, and (2) in rare instances, the U.S. government's tax enforcement agency, the Internal Revenue Service (IRS), may revoke a bond's tax-exempt status, exposing the interest received to federal taxation.

Wilson and Howard (1985) also describe a “marketability” risk stemming from the inherent imperfections in the municipal bond market. As seen from the various tables in this paper, the primary (i.e., new issuance) market for municipal bonds is quite active, and is the focus of most research in this area. The secondary market, however, is relatively inactive and therefore lacks liquidity. An investor wishing to close out a position in a municipal bond may be forced to substantially lower his asking price due to the thinness of the secondary market. Buying a municipal bond may be just as problematic if there are no readily available sellers. Thus, without any competitive offers, a buyer may be forced to consider a premium purchase price.

Oversight and Reporting

Unlike their private sector counterparts, public sector securities issuers are subject to relatively little scrutiny by federal regulatory authorities. Historically, this derives from the perception that at the time of the enactments of the Securities Act of 1933 and the Securities Exchange Act of 1934, municipal securities were safe compared to private sector securities, which were deemed more susceptible to “misrepresentation.” As a result, municipal issuers were generally exempted from the stringent provisions of the securities laws. Hence, other than in instances of fraud, the Securities and Exchange Commission (SEC) exercises little direct authority over municipal bond issuers or their disclosure practices (under the 1934 Act, the anti-fraud provisions of Rule 10b-5 are considered broad enough to include municipal issuers, and the provisions of Rule 15c2-12 requiring continuing disclosures of issuer information are deemed to apply to municipal dealers and brokers).

Likewise, its surrogate agency, the Municipal Securities Rulemaking Board (MSRB), a self-regulatory organization that provides professional guidelines for the municipal securities industry, has authority over brokers and dealers, but not issuers. As Lamb and Rappaport (1987, page 228) observe, “[d]ue to the fact that municipal securities are authorized and issued by states and their political subdivisions, federal regulation of that activity may be contested on the age-old battlefield of states’ rights. Thus, the MSRB does not directly regulate the disclosure practices of municipal issuers; more important, these issuers are still exempt from federal securities laws....the MSRB requires dealers to provide certain information, and this must be obtained from the issuers, who are not subject to MSRB rulings. This, then, further complicates the issue of disclosure and adequate investigation of the issuer by the underwriter.”

Recently, however, the MSRB has begun to centralize its reporting requirements by brokers and dealers online with the Electronic Municipal Market Access system, or EMMA. EMMA provides free public access to real-time and historical official statements and trading data. Historical OS data are available back to 1990, and trading data are available back to 2005.

The task of formulating and disseminating disclosure practices has largely fallen to professional organizations. The Governmental Accounting Standards Board (GASB) issues financial reporting guidelines for state and local governments, which are known as generally accepted accounting principles (GAAP). Compliance with GAAP reporting is a highly desirable feature of a bond issuer’s financial statements, and is the main focus of audits.

Another major professional organization, the Government Finance Officers Association (GFOA), issues “recommended practices” for state and local governments. Recommended practices span critical financial functions such as auditing, financial reporting, budgeting, cash management, debt management, capital planning, and benefits administration. Additionally, the GFOA sponsors an annual program to award a “Certificate of Achievement for Excellence in Financial Reporting” to public sector entities whose CAFR surpasses minimum GAAP standards. Note that the certificate award is based upon financial reporting quality, not financial health.

Conclusion

With a market value exceeding \$2.6 trillion, the U.S. municipal securities market offers state and local governments many capital investment-financing opportunities. Even entities with a solid revenue base often need to tap the governmental capital markets to adequately support and maintain infrastructure or to refinance existing debt. We provide an introductory overview to the conventional debt instruments, general obligation bonds and revenue bonds, and the processes by which these bonds are issued in the primary

market. Additionally, we discuss interest cost measures, investment features and risks, and oversight concerns. We also supply the reader with various characteristics of the market from 2001 to 2007 with the hope that it will spur further academic and institutional research into this area.

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