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# FRBSF WEEKLY LETTER

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## Municipal Bond Behavior

One of the more intriguing developments in financial markets in recent years has been the marked narrowing in the spread between the yields of taxable and nontaxable ("municipal") long-term bonds. This spread has declined by as much as two-thirds since the late 1970s. Recent issues of municipal bonds have sold with yields that are as much as 90 or 95 percent of the yields on comparable, fully taxable bonds. In contrast to these developments for long-term securities, the relative yields on short-term taxable and short-term municipal securities have remained relatively stable, with the latter yielding between 50 and 60 percent of their taxable counterparts.

There are a number of possible explanations for these patterns of yield changes. This *Letter* examines the various hypotheses and discusses their implications for the operation of financial markets.

### Nontaxable debt

The term "municipal bond" often is used generically to characterize all short- or long-term bonds issued by a variety of governmental bodies. General obligation bonds, for example, are a class of taxable bonds issued typically by municipal, county or state governmental bodies with the authority to obligate general tax revenues to retire the bonds. Revenue bonds, on the other hand, typically are issued by special districts or agencies providing transit, public utility, irrigation, housing or other services that receive income from those services. As their name implies, revenue bonds rely upon the flow of revenues from the specific services provided to retire outstanding debt.

The decision to exempt the coupon income from a particular bond from taxation in essence is a decision to subsidize the activity of the issuing level of government. Thus, the federal government, for example, is implicitly subsidizing governments and agencies when the interest on their bond issues is not subject to federal taxes. State and local governments and agencies thus find issuing tax-exempt bonds attractive because the bonds allow them to shift fiscal burdens partially

to another level of government without enacting specially tailored legislation or programs.

### Influences on municipal yields

Because the interest on municipal bonds is tax-free, a major factor determining municipal bond yields is the structure of income tax rates facing bondholders. If a single marginal tax rate applied to all taxpayers, otherwise identical taxable and nontaxable bonds would sell to yield equivalent *after-tax* returns, and these returns would be identical for all taxpayers. For example, if the tax rate were universal at 50 percent, yields on municipal bonds would be roughly 50 percent of the yields available from similar taxable issues.

Under a progressive income tax system, the determination of relative yields is potentially related in a more complex way to the tax structure. If very few municipal bonds are issued, the highest marginal tax rate in the economy will determine relative yields. However, if the class of investors subject to the highest marginal rate is unwilling or unable to hold the entire outstanding stock of municipal debt in its portfolio, the yield on municipal bonds (relative to taxable bonds) must rise to attract investors at lower marginal tax rates. In such a case, the relative yields of taxable and tax-exempt securities would depend not only on the *level* of marginal tax rates, but also on the outstanding *supply* of municipal debt and the progressiveness of the tax rate structure. Thus, the relationship between yields of otherwise identical taxable and tax-exempt debt may react sharply to reductions in marginal tax rates and changes in the quantity of new municipal debt issued.

### Effects of recent tax reform

The major tax reforms initiated in 1981 altered federal income tax rates significantly and thus changed the relative desirability of tax-exempt and taxable bond income. Two tax changes in particular may have contributed to the narrowing of the yield spread.

First, marginal tax rates were reduced significantly for all taxable income brackets. The decrease, phased in over a period of three years,

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was 25 percent for most brackets but was almost 30 percent for the highest bracket as the maximum marginal tax rate on investment income was cut from 70 to 50 percent (i.e., a 20 percentage point decline from 70 percent is a 28.6 percent decline). These changes alone would result in a 25 to 30 percent narrowing of the yield spread.

Second, marginal tax rates were indexed to inflation. This indexation did very little for the highest income taxpayers because they were already subject to the maximum marginal rate. However, for taxpayers below the maximum rate, this change reduced their *anticipated* marginal tax rate position in future years. By itself, this reduction also would tend to increase municipal bond yields relative to the yields on similar taxable issues. Its effects would add to those caused by the basic cut in marginal tax rates and would be most pronounced in the case of long-term (technically, long "duration") municipal bonds for which anticipated changes in after-tax coupon income are more important.

The recent trends in the relationship between taxable and tax-exempt bond yields is consistent with these hypothesized effects. The yields on long-term municipal bonds, which were approximately 66 percent of the yields of their taxable counterparts in mid-1979, had risen to as much as 95 percent by the end of 1982. On the basis of the 25 percent tax cut alone, only an increase to around 75 percent would have been expected. The relationship between the yields of prime grade *short-term* (one year) municipal securities and their close taxable counterparts, however, changed less dramatically. The tax-exempt yields rose from 51 percent to 59 percent of the taxable yield in the same time period. This change is roughly consistent with the 25 percent reduction in the effective marginal tax rate alone. (See chart.)

## Supply effects

The discussion above suggests that increases in the outstanding stock of municipal securities also would tend to narrow the spread between taxable and nontaxable yields. In the late 1970s and early 1980s, many state and local governments reacted to the damaging effects of the high interest rate environment on sectors such as housing and local industrial development by issuing municipal bonds to those markets. The bonds allowed

state and local governments implicitly to wrest a subsidy from the federal government. Mortgage revenue bonds were a particularly widely used device to assist in providing below-market mortgage funds to housing developers and homeowners.

Although the federal government — through the Mortgage Subsidy Bond Tax Act — placed limits on the volume of tax-exempt mortgage revenue bonds that could be issued, this type of bond nevertheless significantly added to the total supply of municipal bonds. (In California, for example, mortgage revenue bonds in 1984 constituted about 25 percent of all long-term state and local debt issued annually, and represented a large addition to traditional municipal borrowing.) For taxpayers to hold additional municipal bonds in their portfolio willingly, the yields on those bonds had to rise to attract households in lower marginal tax rates.

## Changes in 1984

This explanation, based on the increased volume of municipal bonds, also is consistent with the temporary increase in relative yield spreads that occurred in early 1984 and the subsequent precipitous decline later the same year. The Mortgage Subsidy Bond Tax Act expired in 1983 and left state and local governments without authority to issue mortgage revenue bonds exempt from federal income taxation. The Act was reinstated in June 1984, however, and the flow of new mortgage revenue bond issues abruptly returned to earlier levels.

The Tax Act of 1984 also imposed caps on municipal bonds issued for "private activities" to take effect January 1, 1985. Many state and local governments that wanted to issue the affected bonds — mostly industrial development bonds — reacted by rushing to do so before the end of 1984. The result was a total of new municipal debt issued in 1984 that exceeded the 1983 level by over 20 percent. This rush, therefore, also may have contributed to the depression in yield spreads observed at the end of 1984.

## Other contributing factors

The structure of marginal tax rates and the volume of new municipal debt issues are not the only factors, of course, that determine the relationship between taxable and nontaxable yields. Some observers have argued, for example, that risk

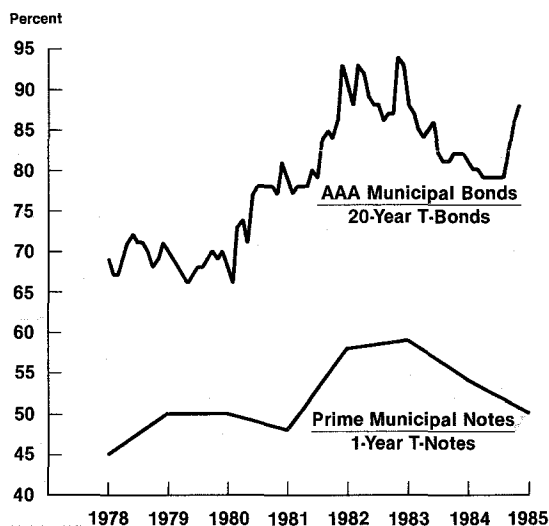
considerations also have affected relative yields. It is, however, difficult to assess the effects of financial difficulties encountered by some cities and states in the 1970s on the market's perception of the default risk of municipal bonds. Nevertheless, the mortgage bond insurance industry — which insures bondholders against loss resulting from default — has grown dramatically since the mid-1970s, suggesting that investor concern over default risk may indeed be more widespread.

In addition, it is often pointed out that many issuers of municipal debt during recent high interest rate periods have included "call" features that allow them to call in the debt under prespecified conditions. These features are attractive to the issuer because they allow the option to refinance the debt at lower cost should interest rates fall. (Mortgage revenue bonds, by federal law, also contain a mandatory three-year call if the funds cannot be invested in the projects intended for their use before that time.) These provisions, however, cause debtholders to demand a higher yield to compensate them for the risk passed onto them by the call provisions.

Our analysis of municipal bond yields, which attempts to control for the default risk and implicit call characteristics of municipal bonds, indicates that these factors are insufficient to explain the observed patterns of yield changes.

A final possible explanation for the narrowing spread between taxable and municipal securities is that the marketplace anticipates further limitations on the exemption of municipal bond income from taxation. (This would be the case, for example, if certain features of the recent Treasury tax reform proposals were implemented.) Such an anticipation would cause the yields on long-term municipal bonds to rise, but have little effect on the yields of short-term municipal debt, a result consistent with the observed pattern of relative yields. This explanation seems unlikely, however, because the major changes in the relative yields of taxable and nontaxable debt occurred between 1980 and 1982, before such tax reforms gained wide currency.

**Yields on Municipal Securities as Percent of Yields on Taxable Securities**



Source: Standard and Poor's, Salomon Brothers, Federal Reserve

### Implications for financial markets

The explanations offered here for the recent behavior of municipal bond yields implies that, for some reason, the taxpayers subject to the highest marginal tax rate are unwilling or unable to hold the entire stock of tax-exempt securities. Their reluctance may be due to the effectiveness of Internal Revenue Service provisions restricting the ability of taxpayers to borrow to finance municipal bond purchases. (If this were not the case, high tax rate households and corporations would be able to increase their after-tax income by deducting the interest on borrowed funds while enjoying tax-exempt income from municipal bond holdings.) Transactions costs also may make it difficult for investors to restructure their portfolios quickly in response to changes in the relative yields of various securities.

Whatever the explanation, our analysis suggests that the long-term municipal bond market will continue to be highly sensitive to changes in tax policy and the supply of municipal securities. Such behavior creates interesting challenges and opportunities for municipal borrowers and private investors alike.

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Opinions expressed in this newsletter do not necessarily reflect the views of the management of the Federal Reserve Bank of San Francisco, or of the Board of Governors of the Federal Reserve System.

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**BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT**

(Dollar amounts in millions)

Selected Assets and Liabilities Large Commercial Banks	Amount Outstanding	Change from	Change from	
	02/06/85	01/30/85	Dollar	Percent <sup>7</sup>
Loans, Leases and Investments <sup>1 2</sup>	188,161	959	13,089	7.4
Loans and Leases <sup>1 6</sup>	170,058	983	15,191	9.8
Commercial and Industrial	52,286	288	5,999	12.9
Real estate	62,015	- 10	2,616	4.4
Loans to Individuals	32,471	- 8	5,694	21.3
Leases	5,289	13	263	5.2
U.S. Treasury and Agency Securities <sup>2</sup>	11,037	1	- 1,229	- 10.0
Other Securities <sup>2</sup>	7,065	- 26	- 871	- 10.9
Total Deposits	193,727	1,491	9,924	5.4
Demand Deposits	44,964	928	2,789	6.6
Demand Deposits Adjusted <sup>3</sup>	29,697	620	991	3.4
Other Transaction Balances <sup>4</sup>	13,227	768	1,028	8.4
Total Non-Transaction Balances <sup>6</sup>	135,536	- 205	6,107	4.7
Money Market Deposit Accounts—Total	43,433	45	3,424	8.5
Time Deposits in Amounts of \$100,000 or more	39,319	- 11	1,147	3.0
Other Liabilities for Borrowed Money <sup>5</sup>	19,617	-1,832	799	4.2
<b>Two Week Averages of Daily Figures</b>	Period ended	Period ended		
	01/28/85	01/14/85		
<b>Reserve Position, All Reporting Banks</b>				
Excess Reserves (+)/Deficiency (-)	123	21		
Borrowings	57	22		
Net free reserves (+)/Net borrowed(-)	66	0		

<sup>1</sup> Includes loss reserves, unearned income, excludes interbank loans

<sup>2</sup> Excludes trading account securities

<sup>3</sup> Excludes U.S. government and depository institution deposits and cash items

<sup>4</sup> ATS, NOW, Super NOW and savings accounts with telephone transfers

<sup>5</sup> Includes borrowing via FRB, TT&L notes, Fed Funds, RPs and other sources

<sup>6</sup> Includes items not shown separately

<sup>7</sup> Annualized percent change