

# A REVIEW OF THE MUNICIPAL BOND MARKET

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Recent developments in the municipal bond market have increased public awareness of the problems state and local governments face in obtaining debt financing.<sup>1</sup> Of special concern to many interested observers is the recent steep rise in the yields on municipal bonds relative to those on corporate bonds with the same credit rating. This article undertakes to assess the significance of this development through an evaluation of recent trends affecting both the supply of and demand for municipal bonds and the resulting effects on the borrowing costs of state and local governments. The discussion focuses on the primary (new issue) market for municipal bonds with emphasis on market participants, market trends over the past fifteen years, recent market developments, and the probable future course of the market.

**Measurement of Municipal Bond Market Conditions** Municipal bonds have generally the same investment characteristics and attributes as corporate bonds with one fundamental exception. The interest income from municipal bonds is exempt from Federal income taxation.<sup>2</sup> This tax-exempt feature makes municipals sufficiently different from corporates that it is uncommon to find the two types of bonds together in the same portfolio. The purpose of the tax-exempt feature is to lower the borrowing costs of state and local governments by enabling them to offer investors a lower yield that is competitive with the after-tax yield available on corporate bonds.

The relationship between the yields on equal credit-rated municipal and corporate bonds differs for investors in different income brackets since the value of the tax-exempt feature, given a progressive income tax structure, increases as taxable income moves into brackets for which the

tax rate is higher. The investor in tax bracket "t" would be indifferent between investment in corporates and in municipals when:

$$(1) \quad R_m = R_c(1-t)$$

where  $R_m$  = the yield on municipal bonds,  $R_c$  = the yield on corporate bonds, and  $t$  = the marginal tax rate at which the after-tax yields on municipal and corporate bonds are equal. Given  $t$  and  $R_c$ , equation (1) determines the minimum municipal yield necessary to induce investors in tax bracket  $t$  to buy municipal rather than corporate bonds. When transposed, the equation can be solved for  $t$  as follows:

$$(1a) \quad t = 1 - R_m/R_c.$$

This equation says simply that given the relationship between yields on municipals ( $R_m$ ) and yields on corporates ( $R_c$ ), the marginal tax rate at which investors are indifferent between the two types of bonds is automatically determined. The relationship between  $R_m$  and  $R_c$  can be affected, of course, by factors other than the value of the tax exemption to investors. Relative risks and call protection, for example, could be major factors. However, the risk factor has been minimized in the discussion by using both Aa-rated corporate and Aa-rated municipal bonds and by assuming the risk relationship between them has remained stable. The call protection factor has been minimized by the use of corporate and municipal bonds with approximately the same call protection.

The relationship  $R_m/R_c$  is a widely used measure of conditions in the municipal bond market relative to other capital markets and specifically to the corporate bond market. High levels of  $R_m/R_c$  are taken to indicate relatively tight credit conditions in the municipal bond market, while low levels of  $R_m/R_c$  indicate comparatively easier credit conditions for municipal borrowers.

<sup>1</sup> Municipal bonds are any tax-exempt debt security of a state or local government, agency, or special authority.

<sup>2</sup> In many cases, the interest income is also exempt from state and local taxation in the issuing state and/or locality.

The course of Rm/Rc over the past fifteen years is shown in Chart 1. As can be seen, the movements are quite erratic with no long-term trends. There are, however, a number of conspicuous short-term movements that merit examination along with the general volatility of the series.

**The Supply of Municipal Bonds** Municipal bonds are issued by state and local governments and their special governmental agencies and authorities primarily to finance capital outlays that are too large to be financed out of current revenue. In many cases a new agency or authority, such as a transportation authority, is created solely to issue bonds for a specific project and, perhaps, to administer the project upon completion.<sup>3</sup>

There are two general types of municipal bonds—general obligation bonds and revenue bonds. General obligation bonds are “full faith and credit” obligations of the issuing body. As such, they are secured by the taxing power of the issuer. These long-term debt obligations are usually issued as serial bonds<sup>4</sup> with maturities from 1 to 30 years. Revenue bonds are issued primarily by governmental authorities that have no taxing power. They are secured solely by the revenue collected from the users of the particular capital project funded by the debt issue. Thus, the credit quality of a revenue bond is directly related to the ability of the issuer to collect revenues from the project involved. In the case of a well established sewer authority this credit quality is likely to be high, whereas the bonds of a new mass transit authority in a low-density city, for example, might be more speculative. These obligations consist largely of one or two long-term issues with a smaller amount of serial bonds with shorter maturities. One type of revenue bond worth noting is the “moral obligation bond.” This type of bond is secured by earmarked revenue and by a promise from the issuing government to appropriate funds from general revenues to cover debt service if revenues prove insufficient. The credit quality of these bonds is as good as the promise or moral obligation to redeem them.

Occasionally, state and local governments will issue short-term debt in the form of tax, revenue, or bond anticipation notes, which generally have

<sup>3</sup> In many cases special authorities are established to provide services “off-budget,” thereby bypassing state constitutional requirements for balanced budgets.

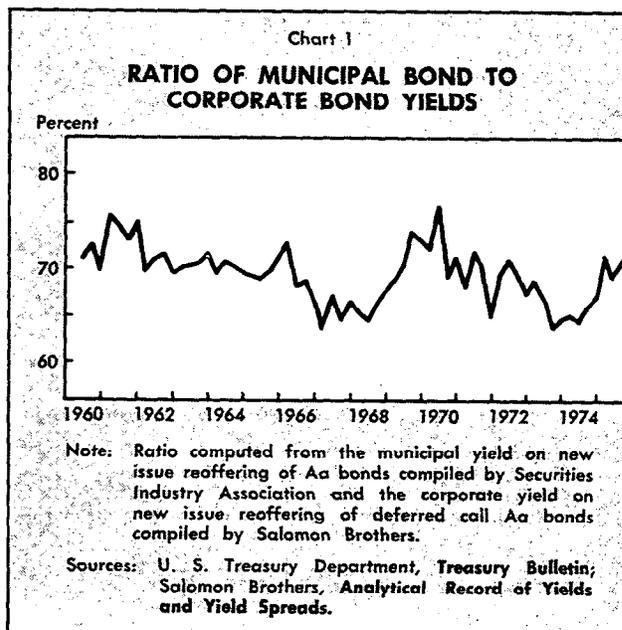
<sup>4</sup> Serial bonds are single bond issues comprised of many different maturities, as opposed to a term bond issue in which all the bonds have the same date of maturity.

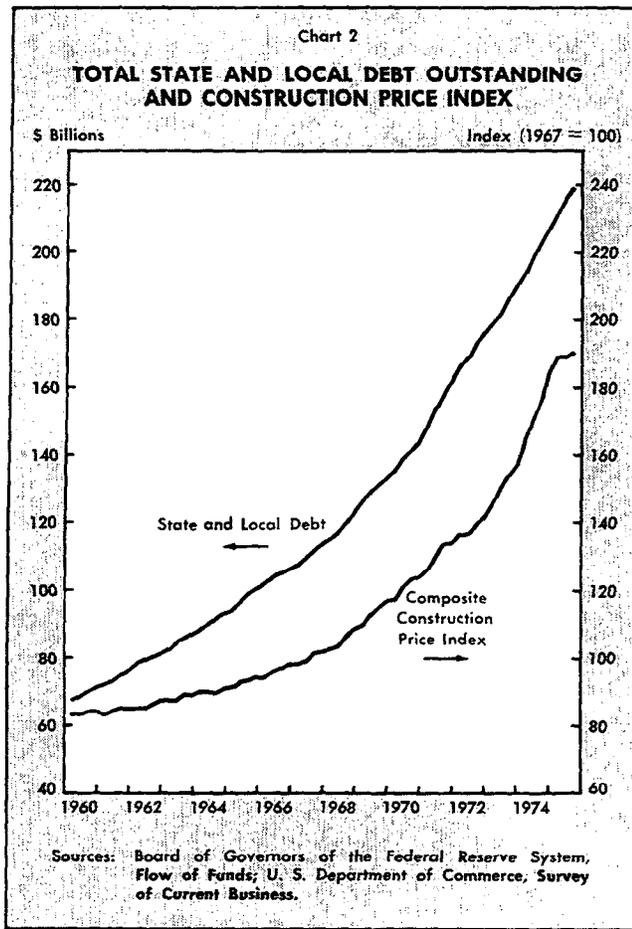
a maturity of less than one year. As the name implies, tax and revenue anticipation notes are issued to aid cash flow while waiting for taxes and revenues to come in, at which time the debt is retired. Bond anticipation notes are generally issued to finance a project during periods of tight credit conditions to prevent getting locked into a high rate, long-term debt obligation. When more favorable credit conditions develop, the short-term debt is refinanced by a bond issue.<sup>5</sup>

The growth in the dollar amount of total state and local debt outstanding is shown in Chart 2. Examination of this time series reveals a remarkable stability in the growth of outstanding municipal debt. The quantity outstanding increased in every quarter from 1960 through 1975. From early 1960 to the middle of 1968, the growth was nearly constant at an average annual rate of approximately 6.8 percent. In the middle of 1968 a significant shift in the growth path occurred. The average growth rate accelerated from 6.8 to approximately 8.4 percent per year. Late in 1970 the growth rate again accelerated, in this instance from 8.4 to 10.4 percent per year.

These sharp increases in the growth of the supply of municipal bonds offered each year might be explained by the acceleration in the pace of inflation in 1968 and again in late 1970, particularly the acceleration of construction costs. This development had two effects. First, as

<sup>5</sup> See J. E. Petersen, “Response of State and Local Governments to Varying Credit Conditions,” *Federal Reserve Bulletin*, March 1971, p. 209.





shown in Chart 2, it increased the cost of construction, thus requiring a larger bond issue to finance any given project. Second, to the extent inflation impacts on expenditures more rapidly than on revenues, it increased the costs of providing government services, which are payable out of current receipts. This reduced the availability of funds from current receipts to help finance capital projects. Consequently, more bonds were issued to help fill this gap. The growth in state and local debt may also have been affected by the entry of New York City into the long-term market to finance operating expenditures and by sharp increases in short-term debt issuance by New York City and New York State.

The stable and continued growth of the total supply of outstanding municipal securities masks some changes in the composition of the total supply that warrant examination. As shown in Chart 3, the percentage of total municipal debt outstanding accounted for by short-term debt is small but increasing. It is a highly volatile function but seems closely related, with a small lag,

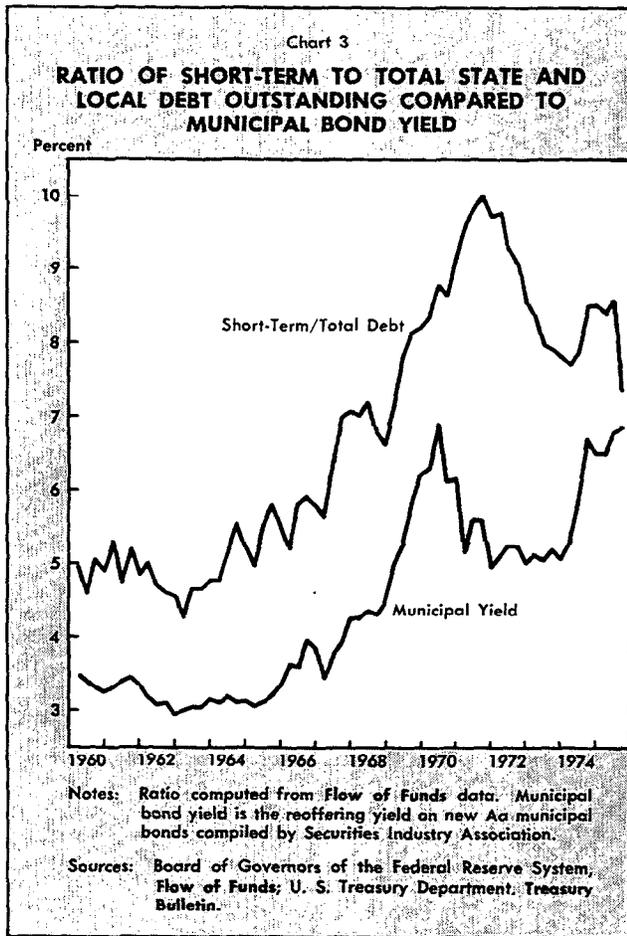
to the yield on municipal bonds. When yields are stable, little short-term financing is used. As yields rise, short-term bond anticipation notes are increasingly used while finance officers await lower rates, which sometimes fail to materialize. As yields turn lower, the short-term debt is retired by the issuance of bonds.

Another interesting development concerning the supply of municipal bonds is the increasing use of revenue bonds as opposed to general obligation bonds. In 1960 revenue bonds accounted for approximately 27 percent of total bonds issued. By 1975 this percentage increased to nearly 40 percent.

This increasing use of revenue bond financing reflects two influences. The first is the apparently growing reluctance of taxpayers to pay higher taxes for debt service and, thus, their disinclination to approve new general obligation bond issues. Accordingly, state and local governments have increasingly resorted to revenue bonds, which do not require voter approval. The second influence is the enlarged concept of what constitutes a proper government service and the growing feeling that, as much as possible, the users of particular government services should pay for them. This enlarged concept of government services is particularly evident in the growing use of tax-exempt financing to obtain funds for pollution control and industrial development projects, which are then leased or sold to private businesses. The governmental unit is, in effect, an agent of industrial tax-exempt borrowing. Ostensibly the government service is the attraction of business enterprises to provide employment. More frequently, therefore, government-sponsored corporations or authorities are created to issue bonds, provide services, and collect the revenues to retire the bonds. Revenue bonds are likely to continue to be of growing importance in the municipal bond market.

To sum up, the supply of municipal bonds has grown at a steady pace with no apparent relationship to the business cycle. While there have been some structural changes in the component mix of the supply of municipal bonds, there seems to be no reason to believe that supply phenomena in the municipal market are responsible for the movements in the ratio of the yields on like-rated municipal and corporate bonds.

**The Demand for Municipal Bonds** Due to the tax-exempt nature of municipal bonds, investors



are generally those persons and institutions subject to high marginal income tax rates. Chief among these are commercial banks, individuals and individual trusts, fire and casualty insurance companies, and to a lesser extent, nonfinancial corporations and life insurance companies. Although not immediately apparent, the market for municipal bonds is rather narrow and has become more so since 1960. While all the previously mentioned groups participate in the market, individual demand and commercial bank demand are of prime importance. In 1960 individual and commercial bank holdings of municipal bonds accounted for 67 percent of the total amount outstanding; by the third quarter of 1975 this percentage had risen to 78 percent.

The nature of the demand for municipal bonds may offer a reasonable explanation for the erratic movements in municipal bond market conditions relative to other capital markets shown in Chart 1. An examination of the patterns of investment behavior by various types of municipal bond in-

vestors in recent years may, accordingly, prove instructive.

*Commercial banks* Of fundamental importance to the understanding of developments in the municipal bond market is the fact that the demand for municipal bonds by commercial banks is a residual demand, i.e., banks purchase municipals with any funds remaining after commitments to other borrowers have been met.<sup>6</sup> The primary investment outlet for commercial banks is loans, and much of the variation in commercial bank participation in the municipal bond market can be explained by variation in loan demand.<sup>7</sup>

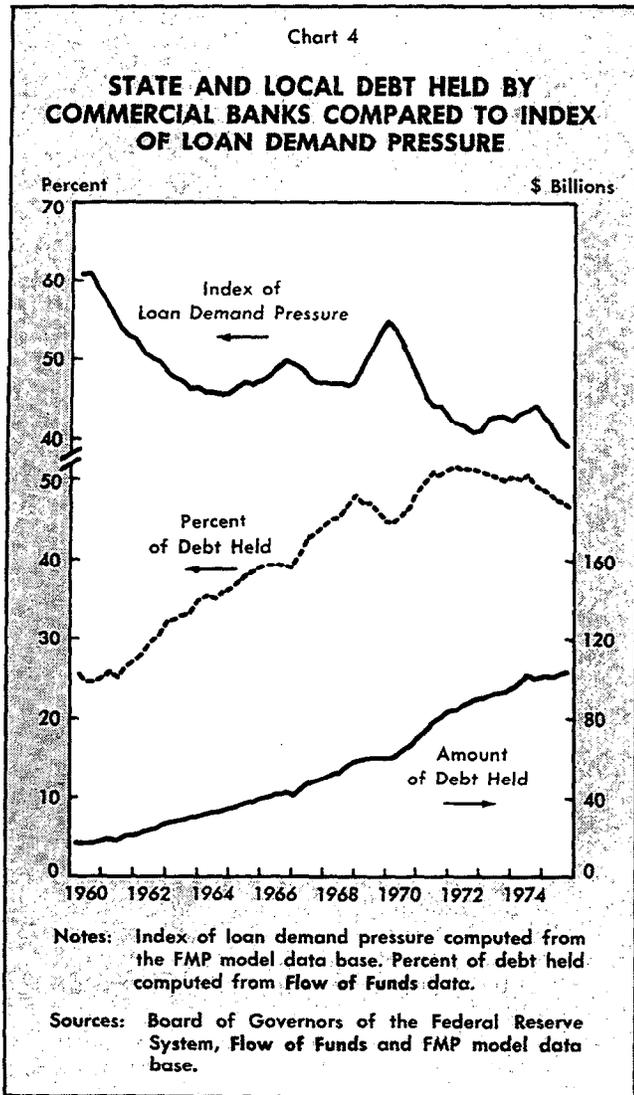
Chart 4 shows an index of loan demand pressure expressed as the ratio of commercial loans to time deposits.<sup>8</sup> This ratio is intended to measure the extent to which banks have residual funds available. The relationship between the loan demand pressure and commercial bank participation in the municipal market is quite clear, particularly during the tight credit conditions of 1968-69. Generally as loan demand pressure falls, demand for municipal bonds by banks rises. As loan demand pressure rises, due to either a rise in loans or a runoff of time deposits, municipal bond demand by banks stabilizes or falls. A notable exception to this tendency, however, has developed since the third quarter of 1974. During that period both loan demand pressure and bank demand for municipals have declined. This recent experience suggests the presence of a new influence tending to reduce bank demand for municipal bonds, a development which will be discussed later.

Commercial banks are presently the primary holders of municipal bonds, although this was not always true. To maintain liquidity, banks tend to prefer short- or intermediate-term bonds. Chart 4 shows the municipal bond investment record of commercial banks, both absolutely and relative to the entire market. The dollar amount of bank holdings has trended generally upward, but not without interruption. Prior to 1961 the

<sup>6</sup> For a discussion of commercial bank demand for municipal bonds as a residual demand see Donald R. Hodgman, *Commercial Bank Loan and Investment Policy*, (University of Illinois: Bureau of Economic and Business Research, 1963), pp. 38-45; and Stephen M. Goldfeld, *Commercial Bank Behavior and Economic Activity*, (Amsterdam: North-Holland Publishing Company, 1966).

<sup>7</sup> See Hodgman.

<sup>8</sup> This measure was chosen because it is used as a portfolio balance variable in explaining municipal bond demand in many econometric models. In the FMP model (a large econometric model used by the Federal Reserve System), for example, the commercial loans/time deposits ratio is used in the equation determining the municipal bond yield.



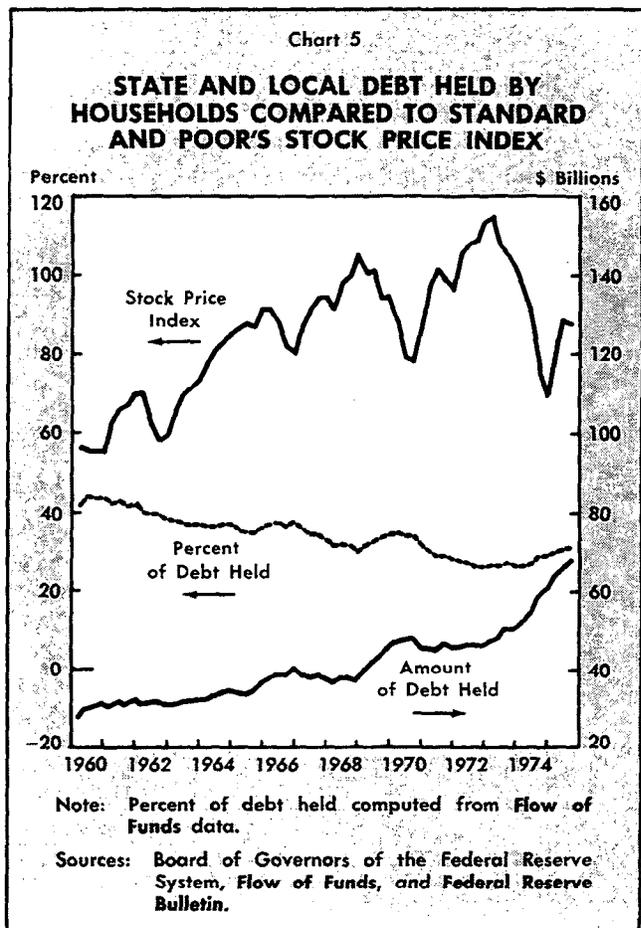
participation of commercial banks in the market was limited and erratic. From mid-1961 to late 1968 holdings grew steadily with the exception of one quarter of liquidation during the tight credit conditions of 1966. In the latter part of 1968, due to increasing loan demand pressure, banks sharply curtailed new purchases of municipal bonds and did not resume them until early 1970. As will be seen, their departure from the market at this point was responsible for a rise in Rm/Rc much like that experienced from the second quarter of 1974 through the first quarter of 1975. The growth in holdings then continued from early 1970 until early 1974, when banks again essentially pulled out of the new issue market. They have yet to return in any significant way.

As shown in Chart 4, the percentage of total municipal debt outstanding held by banks in-

creased from 25 percent in early 1960 to over 50 percent in 1972. Tight credit conditions in 1966 and in 1968-69 temporarily interrupted this rising trend, especially in the latter period. More recently, the percentage has declined since the middle of 1972, with the decline accelerating since the spring of 1974.

*Individuals and individual trusts* For individual investors the principal investment alternatives to the municipal bond market are the stock and corporate bond markets. The reasons for this are that capital gains are taxed at a lower rate than regular income and corporate bonds can provide an income-producing alternative to municipals, depending, of course, on the individual's tax bracket. While there is probably a hard core of high income, risk-averse individuals who seldom seek investment alternatives to municipal bonds, changes in stock prices and the corresponding changes in opportunities for capital gains may cause other, less risk-averse individuals to alternate between stocks and municipals.

The variation in individual participation in the municipal bond market can be explained to a



large degree by variations in stock prices and in the level of municipal bond yields relative to yields on other bonds ( $R_m/R_c$ ). The data in Chart 5 indicate a pronounced inverse relationship between stock prices and individual holdings of municipals. As stock prices rise, bond holdings are increased at a slower rate or are liquidated; the reverse seems to be the case when stock prices fall. This reverse relationship is particularly evident during the periods of generally declining stock market prices from the fourth quarter of 1968 through the second quarter of 1970 and from the first quarter of 1973 through the third quarter of 1974.

The relative level of bond yields ( $R_m/R_c$ ) is important to individual demand for municipals, because as the yield ratio increases the number of potential individual investors rises. Unlike the institutional investors, most of whom face approximately the same income tax rate, individual investors face different tax rates. As  $R_m/R_c$  rises,  $t$  (the tax rate of indifference) falls, lowering the marginal tax bracket at which investment in municipals becomes attractive to individuals. For this reason when banks or other institutional investors leave the market, yields rise until  $t$  falls sufficiently to encourage enough individuals to fill the gap in the demand for municipal bonds and thereby clear the market.

Individuals and individual trusts are now the second most important source of demand for municipal bonds, having fallen from the dominant position that they held during the first half of the 1960's. These investors tend to hold the longer maturities of an issue. Chart 5 shows the municipal bond demand by individuals in absolute and relative terms. Although there is a general upward trend in the dollar volume of total bonds held by households, its movement is much more erratic than that displayed by bank holdings and shows many periods of liquidation.

In relative terms, household demand for municipal bonds has exhibited a general downward trend since 1960. Individual holdings declined from 43 percent of total outstandings in 1960 to a low of 26 percent in 1972-73. Recently, however, this fraction has increased to 30 percent, largely as a result of the decline in the market share of commercial banks and the introduction of municipal bond funds that facilitate investment by individuals.

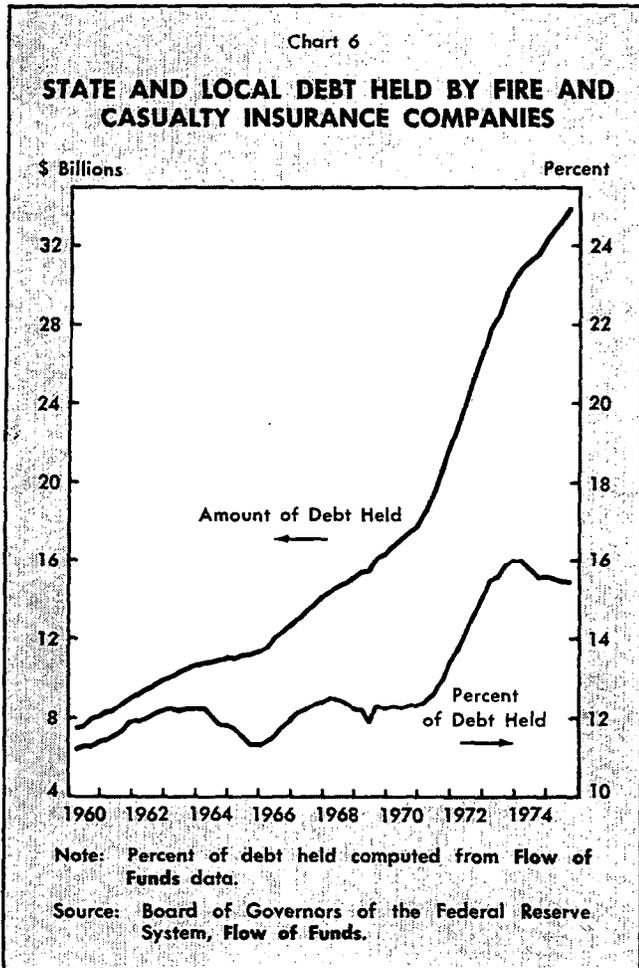
Generally speaking, the high rate of inflation in recent years may be expected to have reduced

the attractiveness of fixed income securities. But, combined with a progressive tax structure a high inflation rate raises the marginal tax bracket of many individuals, thereby increasing the value of the tax-exempt feature of municipal bonds through a reduction in the effective after-tax yield on taxable securities. Chart 5 suggests strong demand for municipals by individuals in recent months. This demand may be associated with high municipal yields relative to taxable bond yields and to uncertainty about the extent of the stock market recovery.<sup>9</sup> The present high level of demand by individuals for municipal bonds is easily understood when it is realized that investors in marginal tax brackets as low as 30 percent (i.e.,  $t \leq 30$ ) receive a return on municipal bonds greater than the after-tax yield available on corporate bonds.

*Fire and casualty insurance companies* Fire and casualty insurance companies are ranked third in importance in the municipal bond market. These companies, like commercial banks, are subject to the standard corporate income tax rate and thus desire the tax-exempt income municipal bonds can provide. Unlike life insurance companies, fire and casualty insurance companies cannot accurately predict their probable losses; thus their net taxable income, as well as their cash needs, are highly variable. For these reasons, the demand for municipals of any fire and casualty insurance company is unstable. However, while any particular company may be highly erratic in its purchases, fire and casualty insurance companies as a group are the most stable source of demand in the market. Chart 6 shows a steady upward trend in holdings of this group since 1960, with no periods of liquidation. In the first quarter of 1971, fire and casualty insurance companies markedly increased their rate of purchases, and their percentage of the market also began to rise. Their market share stabilized again in the third quarter of 1973, however.

The percentage of total municipal outstandings held by fire and casualty insurance companies was remarkably stable from 1960 through 1970 at approximately 12 percent. By 1973, this market share had increased to its present level of 15 percent. Recent reductions in purchases appear to be due to lower industry profits and should prove temporary.

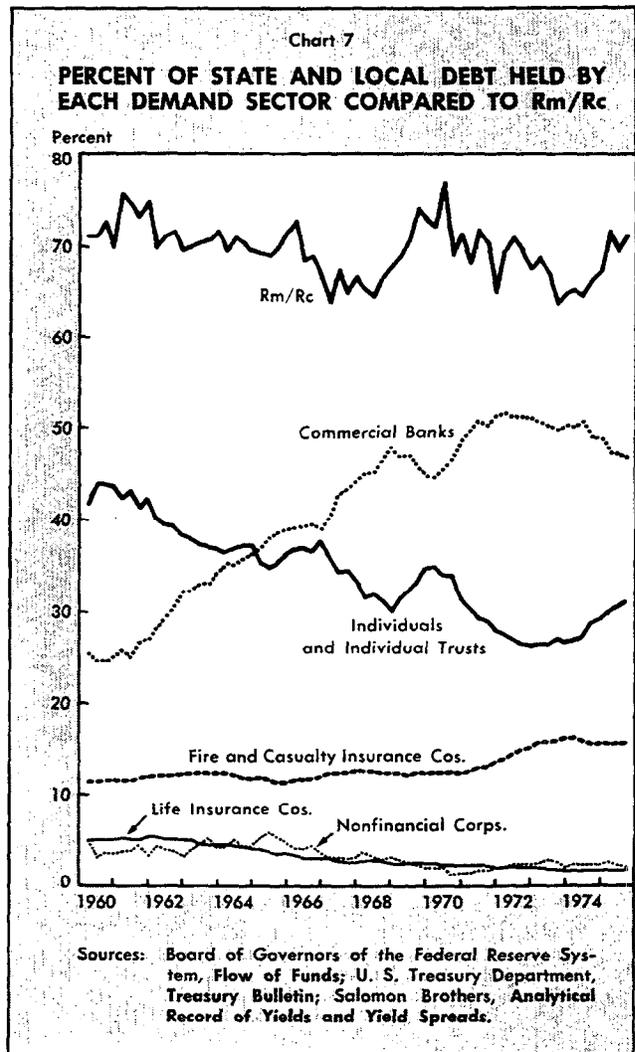
<sup>9</sup> Municipal bond funds, a primary bond investment instrument of individuals, set an all-time sales record of \$1.05 billion in the first half of 1975 compared to \$1.26 billion in all of 1974.

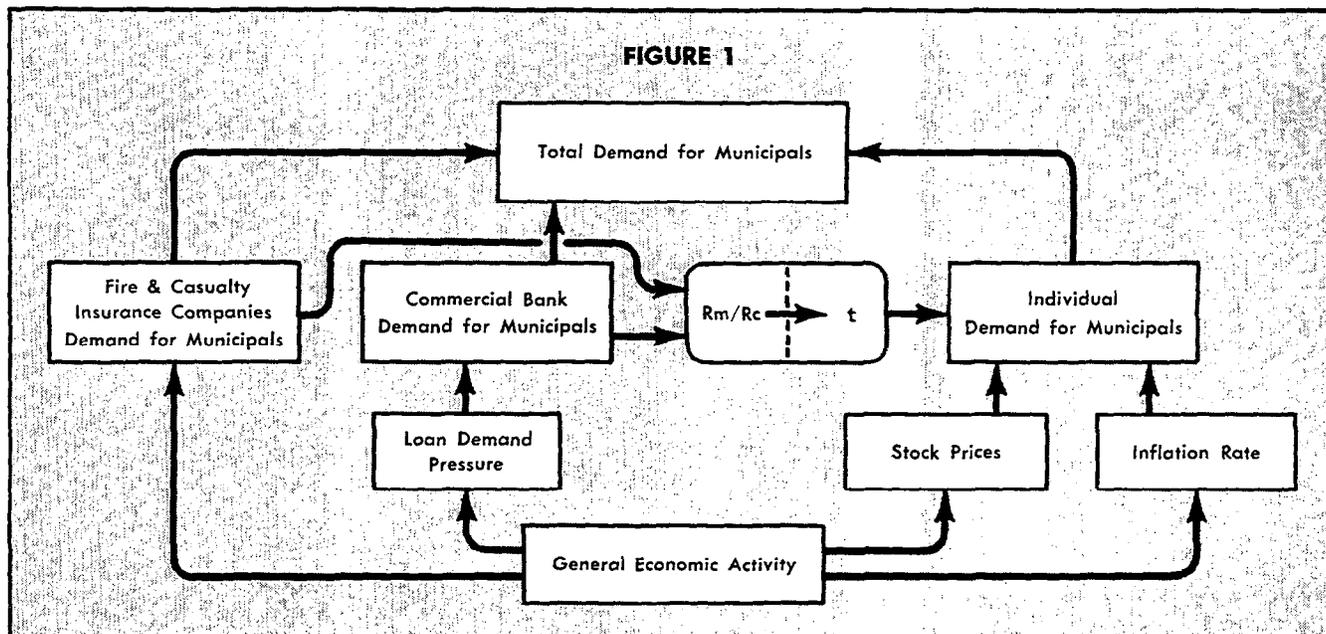


*Nonfinancial corporations and life insurance companies* Both individually and as a group, nonfinancial corporations and life insurance companies are relatively insignificant buyers of municipal bonds. Life insurance companies buy few municipals because they are unable to take full advantage of the tax exemption, due to the low effective tax rate on these companies. In 1960, nonfinancial corporations held roughly 3 percent of outstanding municipals, while life insurance companies held 5 percent. The market share of each fell to roughly 2 percent by the first quarter of 1975. The participation of these investors is the most erratic of any in the market. Nonfinancial corporations primarily buy short-term obligations to meet cash management needs. For most of the 1960's, life insurance companies were a supply factor in the secondary market rather than a demand factor in the new issue market, although their purchases of new issues have recently increased. In general, these two investor groups have little impact on the municipal bond market.

**Past Experience in the Municipal Bond Market** Due to the residual nature of the demand for municipal bonds by the commercial banks, the overall composition of demand is highly sensitive to developments in other capital markets and in the economy generally. The participation of various investor groups changes greatly over short periods as well as over the longer term. This variation in the composition of demand for municipal bonds seems to be a major factor explaining movements in  $R_m/R_c$ .

Figure 1 illustrates the mechanism through which changes in demand composition affect  $R_m/R_c$  and the municipal market in general. An increase in the level of demand for municipal securities among institutions subject to high marginal tax rates (e.g., an increase in commercial bank demand triggered by a decline in loan demand pressure) causes municipal bond prices





to rise, resulting in lower levels of  $R_m/R_c$  and thus higher levels of  $t$ . At the higher levels of  $t$ , the relative attractiveness of municipal bonds declines along with the value of the tax exemption. Individual demand for municipals falls as many individual investors forego purchases of municipal bonds in favor of alternative investments in stocks and corporate bonds. Under these circumstances most investors are in the same tax bracket as the marginal investors, and all receive a yield very near the after-tax yield available on corporate bonds.

When demand for municipal bonds declines among tax-exposed institutional investors, as when loan demand pressure rises, the situation is reversed. Municipal prices fall, causing  $R_m/R_c$  to rise and  $t$  to fall. This falling level of  $t$  increases the value of the tax exemption and the demand for municipal bonds among investors in lower tax brackets, thereby inducing individuals and tax-sheltered institutions to enter the market. Due to progressive taxation, a larger number of individual investors will be in tax brackets above the marginal tax bracket ( $t$ ) of the marginal investors. Thus, in this situation, many more investors receive a tax-exempt yield considerably greater than the after-tax yield available on corporate bonds.

Chart 7 shows the composition of demand for municipal bonds and the ratio of municipal bond to corporate bond yields since 1960.  $R_m/R_c$  generally fell from 1961 through the second quar-

ter of 1968. This fall was due to the rising market participation of commercial banks (caused by generally falling or stable loan demand pressure), which also reduced the participation of individual investors. In the second quarter of 1968  $R_m/R_c$  started a steep rise (steeper than the recent one) that lasted, with one interruption, through the second quarter of 1970. This period was one of high loan demand pressure on banks. To accommodate loan customers, commercial banks halted new purchases of municipal bonds. The departure of banks from the municipal market reduced institutional demand for municipals, causing  $R_m/R_c$  to rise and  $t$  to fall until individual demand for municipals, spurred both by rising  $R_m/R_c$  and falling stock prices, rose sufficiently to clear the market.

The rising participation of institutions caused  $R_m/R_c$  and the participation of individuals to generally decline from the second quarter of 1970 to the second quarter of 1974. Owing to easier loan demand pressure conditions, bank demand for municipals resumed in the first quarter of 1970 and rose through the first quarter of 1972. At that time a period of relative stability in bank demand for municipals began that lasted until the second quarter of 1974. Municipal bond demand by institutions was aided by the growth in municipal market participation of fire and casualty insurance companies from 1971 to 1973. This institutional demand supplanted a portion of the participation of individuals, whose market

share declined from the first quarter of 1970 to the third quarter of 1972, due both to falling Rm/Rc and rising stock prices, and then stabilized until the second quarter of 1974.

**Recent Developments and Problems** The second quarter of 1974 brought an increased awareness of the importance of commercial banks to the municipal bond market. While the financial problems of many cities have been widely publicized as the main reason for the recent steep rise in Rm/Rc, it would appear that the decline in commercial bank participation in the market, from the second quarter of 1974 to the present, is the primary cause. The rise in Rm/Rc has been further aggravated by a decline in the demand for municipals by fire and casualty insurance companies in the first quarter of 1975, because of a low level of industry profits.

The significant fact about the recent developments is that bank demand for municipals has fallen during a period of slack loan demand pressure, as is shown in Chart 4. This unprecedented situation indicates that a departure from traditional patterns of demand for municipal bonds by commercial banks may be occurring.<sup>10</sup> Banks have found other profitable methods of tax-sheltering their income through leasing and foreign operations. Leasing operations enable banks to realize tax savings from the investment tax credit and deductions for depreciation. Foreign operations provide banks with deductions or tax credits for taxes paid to foreign governments. Recent additions to loan loss reserves and losses on security holdings have further reduced banks' taxable income. Since 1961 the effective Federal tax burden on commercial banks has fallen about 60 percent, with much of the decline occurring in recent years.<sup>11</sup> Banks have accumulated a significant amount of municipal debt and may have reached a saturation point. Finally, banks are increasingly concerned with their liquidity position. These developments suggest that banks have a reduced need and desire for the tax-exempt income from municipal bonds and thus may not buy the volume of municipals in the future that they have in the past.

<sup>10</sup> This development will have an adverse impact on the validity of municipal bond demand and yield forecasts made by many econometric models that incorporate loan demand as an explanatory variable.

<sup>11</sup> Margaret E. Bedford, "Income Taxation of Commercial Banks," *Monthly Review*, Federal Reserve Bank of Kansas City, July-August 1975, p. 10.

It does not appear that the New York City financial crisis can be held primarily responsible for the recent rise in Rm/Rc. The rise in Rm/Rc began, prior to the general recognition of New York City's problems, under the same conditions that initiated and maintained a similar rise in Rm/Rc in 1968-69, i.e., a reduction in commercial bank demand for municipal bonds. These conditions have persisted throughout the recent experience. This is not to imply that the recent chaos and uncertainty in the market have had no impact. It is probable that the lack of information concerning state and local finances combined with the recent financial disclosures of some cities and states have resulted in some additional risk premium being demanded, i.e., investor discounting of credit ratings may have started or increased. However, this should be a short-term phenomenon until fuller financial disclosures are made by state and local government borrowers to allay any investor fears of municipal financial collapses occurring. The fuller disclosure and credit reexamination by municipal credit rating agencies may result in the downgrading of some municipal securities, as New York State's recent experience indicates, and the upgrading of others. Thus, in the long run the major impact of the New York City financial crisis on the municipal bond market will be the reexamination of state and local creditworthiness, and the possible regrading of some municipal securities, not a general rise in Rm/Rc for equal risk securities. However, the outcome of litigation concerning the New York City debt moratorium may have a substantial impact on the value of guarantees associated with general obligation bonds and hence the evaluation of their risk.

The immediate future does not appear to offer any substantial relief for municipal borrowers. For the time being banks will probably remain on the sidelines, especially as loan demand quickens with the economic recovery. Therefore, individuals will be the primary source of demand for new bond issues in the immediate future, aided by the recent entrance of thrift institutions into the market. As the stock market improves, individuals will demand higher yields to remain in the market. Thus state and local borrowing costs will likely remain relatively high, assuming the outstanding supply continues to grow at its historical pace.

One solution that has been suggested to the problem of high municipal rates relative to cor-

porate rates is a Federally-subsidized taxable municipal security.<sup>12</sup> The reasoning behind this plan is that the tax-exempt status of municipal securities was originally intended as a subsidy to municipal borrowers. However, as  $R_m/R_c$  rises, more and more of the subsidy goes to the investors. If the bonds were taxable, they would be competitive with corporate bonds of like rating and would be attractive to the growing number of tax-sheltered institutions. The subsidy could be returned to state and local governments through direct payments by the Federal Government. The funds would come primarily from the increased tax revenues resulting from the bonds' taxable income. Another suggested solution is to reduce the supply of municipal bonds by limiting the amount of, or disallowing the tax exemption on, industrial revenue and pollution control bonds. If  $R_m/R_c$  remains at its present high level, there will be an increasing call for one or both of these remedies.

**Summary and Conclusion** The ratio of municipal bond to corporate bond yields exhibits considerable variability, part of which takes the form of explainable short-term cyclical movements. An analysis of the municipal bond market indicates that while supply is steadily rising at a stable rate, demand is continually changing in composition. These changing demand patterns are primarily due to the influence of other capital markets on municipal bond investors, i.e., to the residual nature of commercial bank demand for

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<sup>12</sup> See Peter Fortune, "Tax-Exemption of State and Local Interest Payments: An Economic Analysis of the Issues and an Alternative," *New England Economic Review*, Federal Reserve Bank of Boston, May/June 1973, pp. 3-20.

municipal bonds and to individuals' changing demand for municipals versus stocks and corporate bonds. The continual change in demand is responsible for the short-term volatility in the movement of  $R_m/R_c$  as well as its longer-term movements.

Commercial banks are of primary importance to the municipal bond market, as their non-participation from the fourth quarter of 1968 through the first quarter of 1970 and since the second quarter of 1974 has made clear. There are indications (e.g., low bond demand concurrent with slack loan demand pressure, additions to loan loss reserves, and the use of other methods to tax-shelter income) that the present low level of demand for municipal bonds by commercial banks may be longer lasting than similar situations in the past. If these indications are correct, new buyers of municipal bonds will have to be found. Steps in this direction are currently under way. The marketing efforts of municipal bond funds seem to have increased individual investor demand for state and local securities, as evidenced by the record sales figures municipal bond funds posted in the first half of 1975. The recent entrance of thrift institutions into the market is another positive development. Other possible solutions involve limiting the supply of some types of tax-exempt securities and the development of a Federally-subsidized taxable municipal bond. Nonetheless, one fact is clear. If state and local governments are to achieve any stability in their borrowing costs relative to their corporate counterparts, they must structure their bond offerings around a stable group of investors that will hold municipal bonds as a primary investment.