Commercial Bank Investment in Municipal Securities

Historically commercial banks, together with casualty insurance companies and individual households, have been the major group of investors in tax-exempt municipal bonds. Banks, however, are now playing a much diminished role in the tax-exempt market. This article examines the reasons for the change in bank behavior.

The declining involvement of banks has taken place at an inopportune time for state and local governments. In 1982 and 1983, these governments issued debt at a net rate of about $50 billion per year, more than twice the average rate of the previous decade Over the same two years, banks invested at a net rate of less than $1 billion per year, about one tenth the rate of the previous decade.

Although banks continue to participate in the municipal market, their own holdings since 1971 have not grown at the same pace as the municipal securities market (Chart 1) Today banks hold one third of all outstanding municipals, compared with over one half in 1971. Nor has their investment in municipals kept pace with the growth of the rest of their investment and loan portfolio (Chart 2).

Since 1981, banks have sharply reduced their municipals purchases Their net purchases dropped by half in 1981 and remained low in 1982. They actually sold more municipal securities than they bought in the first three quarters of 1983. By early 1983, individual households exceeded commercial banks as the largest holders of municipals for the first time since 1964 And the share of banks' assets held in municipals also fell to levels not seen since the early 1960s If commercial banks had instead maintained this share at 1971 levels, they would have held $90 billion in additional municipal bonds in 1983, over 150 percent of their actual holdings at that time

The decline in bank investment in municipal securities has been broadly based. Even though small banks generally hold proportionally more municipals than large banks, both groups have reduced the share of domestic assets held as municipals (Chart 3).

No single explanation accounts for banks' diminished role in the municipals market. Since 1979, and especially since 1981, virtually every factor influencing bank tax-exempt holdings has worked toward a decline in bank investment in municipal bonds. Changes in tax laws in 1981 and 1982 probably have had the largest effects. But bank profitability, the level and volatility of interest rates, and credit risk have also been important

Such a highly adverse coincidence of effects is unlikely to be repeated. And the precipitous slide in bank demand for municipals probably will not continue. But, if these effects are to be reversed and if banks are to return to at least their pre-1981 role as investors in municipals, some major changes in the financial environment or in Federal tax laws are needed Short of this, state and local governments can take some steps to encourage bank investment Most importantly, these governments must understand the investment needs of banks and become both more creative in designing and more aggressive in marketing their securities specifically to meet those needs.

The analytical framework

There are two basic determinants of a bank's decision to hold municipals: the net aftertax yield it can earn from a municipal and its desire for municipals at that yield relative to other investments or loans. A simple diagram will help organize the analysis around factors affecting each determinant (Chart 4). By referring to the diagram one can gain a clearer understanding of why these factors have influenced bank investment behavior and how they may have reinforced or offset each other in recent years

Of course, the supply and demand for municipals ultimately dictate their nominal yield But interest rate determination is not the primary concern of this article. Accordingly, the view taken here is that of an individual bank which observes the nominal yield available to it and, on the basis of several other factors, decides what its municipal holdings should be

The effect of these factors is illustrated in the diagram by two lines (Chart 4). Line Y represents the net aftertax yield on municipals to a particular bank. Line D represents the bank's demand for tax-exempt securities at a given yield. A similar diagram could be drawn to represent the bank's decisions with respect to any category of loans or investment. But the decision to buy municipal bonds takes on some special characteristics because the net aftertax yield schedule that each individual bank faces varies with the share of tax-exempt bonds in its total assets.

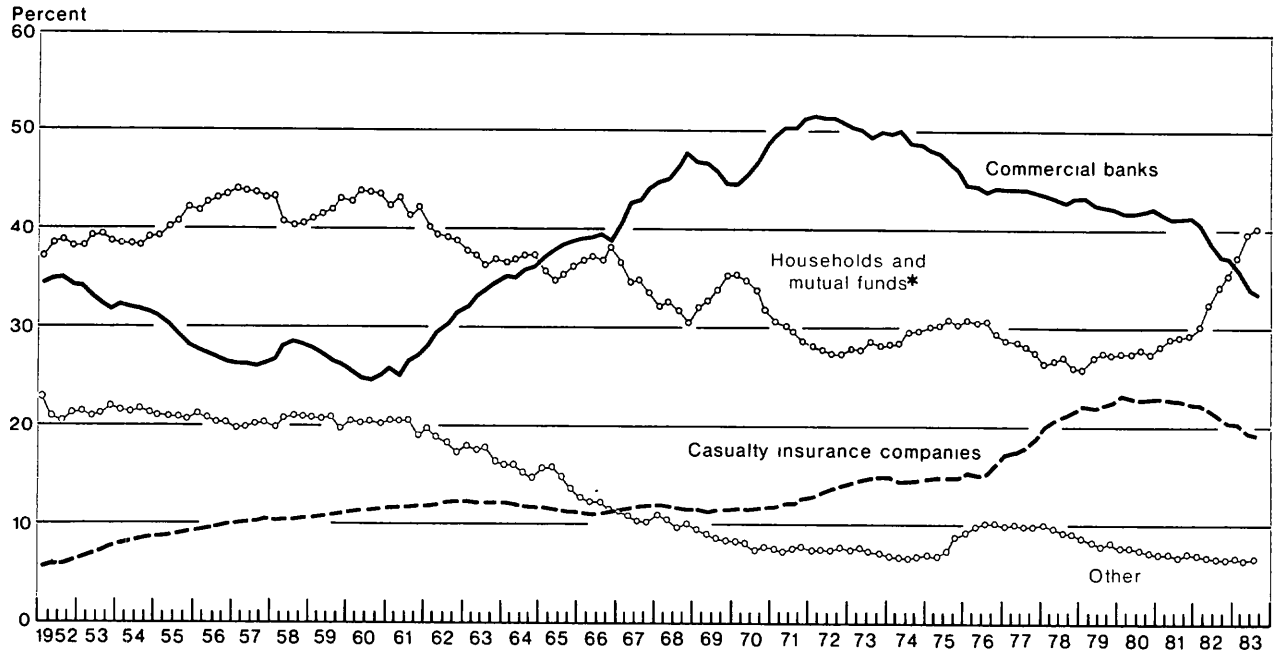
Net aftertax yield

The yield realized by a particular bank on municipal bonds is influenced by, but is not identical to, the nominal coupon yield of the security. The reason is that a municipal security is valuable largely because of its tax implications. As a consequence, many factors other than

Chart 1

Share of State and Local Obligations Held by Various Groups of Investors

Percentage share of municipals outstanding at end of quarter



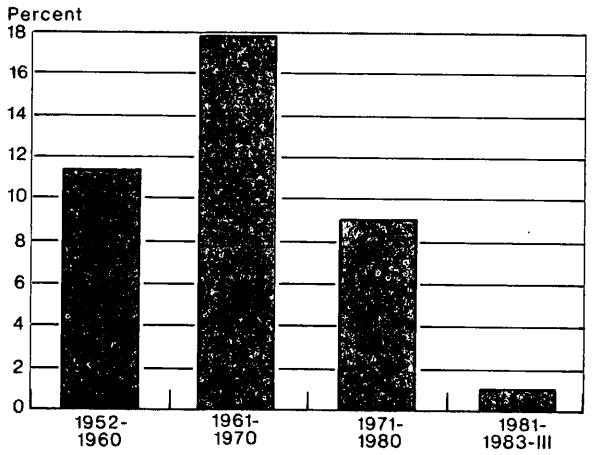
Commercial banks include U S -chartered banks, domestic affiliates, Edge Act and Agreement Corporations, U S agencies and branches of foreign banks, and banks in U S possessions

*Includes open-end mutual funds Figures for closed-end mutual funds, including unit trusts, should also be in this category but cannot be separated from other holders

Source Board of Governors of the Federal Reserve System, Flow of Funds

Chart 2

Share of Newly Acquired Bank Assets Held in the form of Municipal Bonds *



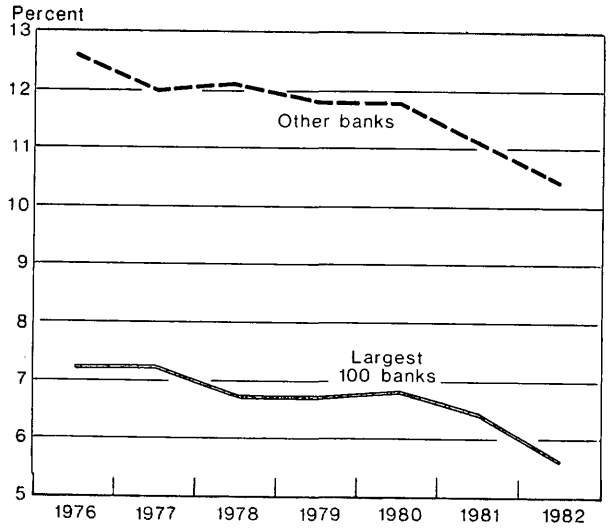
*Annual average of the ratio of purchases, less sales and redemptions of maturing holdings, to the net increase in total financial assets Financial assets include all bank assets except current surplus, plant and equipment, and interbank positions

Source Board of Governors of the Federal Reserve System, Flow of Funds

Chart 3

Commercial Bank Holdings of Municipals as a Share of Total Domestic Assets

By asset size



Source Board of Governors of the Federal Reserve System, Reports of Condition and Income

coupon yield come into play in determining the value of a municipal as a tax shelter for an individual bank Not only is the income on the municipal security exempt from Federal taxation (as it is for all investors), but also appropriate use of municipal investments can shelter from taxation bank profits on other operations This tax savings is an important component of the net aftertax yield of a municipal security The size of the tax savings is influenced by three main factors (1) the marginal corporate income tax rate, (2) the bank's interest carrying costs, and (3) the degree to which carrying costs are deductible from taxable profits.

The determinants of the net aftertax yield can best be illustrated by a simplified example Consider a bank with $100 million of investments and loans which earn an average taxable yield of 10.5 percent and are financed by liabilities with an average cost of 9 5 percent By the year-end the bank will earn taxable profits of $1 million. Without some "shelter" the bank would have a tax liability of approximately $460,000 based on the marginal corporate tax rate of 46 percent (t). The bank could eliminate this liability entirely if, at the beginning of the year, it borrowed $10 5 million (M) at, say, a six-month certificate of deposit (CD) rate of 9 5 percent and invested the borrowed funds in municipal bonds paying a tax-exempt yield of 9 percent (r_{ex}). The $1 million carrying cost for these municipals (cM) is deductible from taxable profits, reducing them to zero. Therefore taxes too are reduced to zero.[1] The total net aftertax income from these municipal securities is the tax-exempt earnings of about $950,000 less the carrying costs of almost $1 million plus the tax savings of $460,000 for a net yield of 3 9 percent ($r_{ex} - c + tc'$).

In this example, $10 5 million is the most the bank would invest in municipals If the bank borrowed another $1 million to buy municipals, the income would be $90,000 in tax-exempt earnings less $95,000 in carrying costs. The bank no longer has any income tax obligations so that there is no tax savings from this additional municipal investment. Thus, the net aftertax yield for these additional municipals is negative. This maximum level of bank municipal investment is denoted by the drop-off, or "kink", in the net aftertax yield schedule (Chart 4).

The point where this kink occurs can be expressed in terms of the municipal-to-asset ratio at which taxable profits are reduced to zero. In this case, the bank adds

[1]The Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA) limited this deductibility to 85 percent of carrying costs

municipals to its initial taxable investments of $100 million until its total assets reach $110 5 million for a municipal-to-asset ratio of 9 5 percent (A complete derivation of this relationship is illustrated in Chart 4.) Although the net aftertax yield on municipals in the absence of any tax savings is not necessarily negative, the ratio at the kink is usually the maximum ratio a bank is willing to maintain The lower net aftertax yield on a municipal security is almost always inferior to the corresponding yield on taxables.

Any change in taxable profits, carrying costs, tax savings, or nominal yields will alter the shape or position of the net aftertax yield schedule. The direction of these effects can be demonstrated by using the same example. The fundamental factor is taxable profits. These fall when income on taxable investments or loans declines or when deductible expenses increase, such as business operating expenses, the cost of borrowed funds, loan loss provisions, and depreciation of physical capital. When taxable profits decline, the yield schedule shifts to the left so that the benefits of tax reduction disappear at a lower municipal-to-asset ratio In the example, a decline in the level of taxable profits to $500,000 would move the kink from a ratio of 9 5 percent to a ratio of 5 percent

A decrease in the marginal corporate tax rate has the effect of shifting downward the portion of the yield curve to the left of the kink. An increase in the cost of borrowed funds has two effects. The entire yield curve shifts downward because the net yield is lower. And the kink shifts to the left because, with higher carrying costs, a smaller volume of municipals shelters all taxable profits. In the example, costs of 10 percent instead of 9.5 percent will shift the left portion of the yield line to 3 6 percent from 3.9 percent, the right portion to a negative 1 percent from negative 1/2 percent, and the location of the kink to 4.8 percent of assets from 9 5 percent

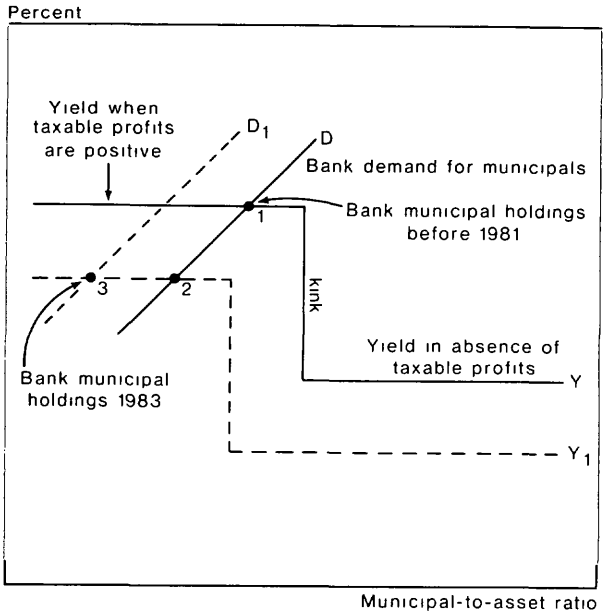
Finally, when the nominal yield on municipals declines, the net aftertax yield falls at all points and the point of fully sheltered profits remains at the same ratio of municipals to assets. In the illustration, a decline in the coupon from 9 percent to 8.5 percent lowers the upper and lower sections of the yield schedule by 1/2 percentage point

Demand for municipals at a given yield

On average, a bank demands less than the volume of municipals denoted by the kink point in its version of Chart 4 Some banks may, in fact, choose to stay close to the kink point, but this choice depends on where its demand schedule (D) lies on Chart 4 relative to the net aftertax yield line (Y). Its demand schedule would intersect the kink point if the bank aimed to pay no

Chart 4

Net Aftertax Yield of a Bank's Municipal Holdings



The net aftertax yield on a tax-exempt security consists of

the nominal yield of the security (r_{ex}) less

the interest carrying cost of financing the security (c) plus

the tax savings, *i e*, the allowable deductible interest carrying cost (c') multiplied by the marginal corporate income tax rate (t) $r_{ex} - c + tc'$

When the bank has no tax obligations, $tc' = 0$

Taxable profits consist of

the yield (r) derived from the income on all taxable assets and operations (A − M) less

the total interest carrying costs (c) of the bank's financial liabilities (L) allocated to taxable assets (A − M) as a share of total assets (A) less

all other allowable expenses (s) of taxable assets (A − M) less

the total interest carrying costs of the bank's financial liabilities (cL) that are permitted to be allocated (c'/c) to the share of a bank's assets (A) held as tax-exempt securities (M)

$r(A - M) - cL[(A - M)/A] - s(A - M) - cL(c'/c)(M/A)$

In other words, since A = L, taxable profits are the net interest margin adjusted for expenses (r − c − s) earned on taxable assets (A − M) less

the deductible carrying cost (c') of tax-exempt securities (M) (r − c − s) (A − M) − c'M

If we set taxable profits equal to zero, we can solve for the municipal-to-asset ratio at which the net aftertax yield drops to $r_{ex} - c$

$M/A = (r - c - s)/c' - [1 + (r - c - s)/c']$

income taxes, if tax-exempt bonds were the only shelter, if the bank had no foreign tax credits or loan loss provisions, and if except for their tax status municipal bonds were perfect substitutes for other securities. However, all these conditions are rarely met. Four factors help determine the location of the demand schedule:

- The availability and yield of alternative investments, particularly tax-shelter investments;
- The bank's liquidity requirements and preferences and the liquidity of other assets relative to municipal bonds;
- The risk of default, the risk of a downgraded credit rating, and the bank's attitude toward these risks; and
- The size of the bank in terms of the investment resources available.

The most important alternative to municipal bonds as a tax shelter for bank profits is leasing. This entails the purchase of a piece of equipment, building, or other depreciable asset for lease to a third party. The bank earns taxable income from the lease, but the purchase of the physical asset entitles the bank to substantial credits and deductions which reduce tax liabilities on other operations. Leasing by banks was first permitted in 1963 but did not become widespread until after 1970 when amendments to the Bank Holding Company Act made large-scale leasing easier. Moreover, leasing is often a highly leveraged investment by which the bank can receive substantial tax benefits while committing relatively few "equity" funds (Appendix 1). As a result, leasing can offer aftertax returns well above those on municipals.

The bank's need for liquidity is a second factor that affects demand for municipal securities. Municipal bonds are more liquid than some other assets, for example, equipment for leasing. However, most tax exempts are long term and the secondary market for municipals is not nearly so well-developed as the market for some other securities. Anything that increases a bank's desire for liquidity may decrease its demand for long-term forms of tax shelter. Changes that make municipals more liquid increase demand for tax exempts

Third, holding municipal securities exposes the bank to credit risk. There is some chance that a municipal security could fall into default. There is an even greater probability that downgrading by a credit agency will reduce the market value of a bank's holdings. Any perceptions of increased riskiness tend to reduce demand at given net aftertax yields.

The size of a bank is also a factor in the level of bank demand for municipal securities. Large banks have access to more alternative investments and tax shelters, such as large-scale leasing. Hence, a large bank's need for municipals as a source of income and tax shelter is relatively less than that of a smaller bank In fact, large banks invest more in leasing and less in municipals than small banks. By 1982, the largest 100 banks had accumulated about 6 percent of their assets in municipal securities whereas the small banks had accumulated more than 10 percent in municipals (Chart 3).[2]

The geographic location of a bank is an additional factor often cited as a source of varying demand. Because of the large number and relatively small size of most municipal bond issues, compared with corporate or Treasury bond issues, there are fewer potential investors for a typical municipal bond issue [3] In particular, those investors are likely to be located in the same state or locality. For that reason, many analysts characterize the municipal market as geographically segmented so that different demand curves exist for each state. Preliminary investigation suggests that state-by-state differences in bank demand are not systematic (Appendix 2) In other words, it appears that nationwide factors common to all banks are the most important influences on aggregate bank municipal holdings.

Trends over the past thirty years

Bank investment in municipal securities over the past thirty years can be generally explained in terms of changes in these factors. During the 1950s, bank municipal holdings were constrained mostly by banks' reliance on their securities portfolios for most of their liquidity. This practice was incompatible with large

[2]This difference between large and small banks in the mix of tax shelters is ironic because it does not coincide with the difference between the proportional taxes they pay Since leasing provides a superior shelter from taxes, compared with municipal securities, and since large banks do more leasing and less investment in municipals, compared with small banks, one would expect large banks to shelter proportionately more of their income from taxes This does not seem to be the case Take the ratio of aftertax to before-tax income as one indicator of proportional taxation The natural expectation is that large banks shelter more income from tax and have a higher ratio In fact, in 1982 the ratio was 75 percent for the top 100 banks and 85 percent for the smaller banks A lower average U S tax rate for the smallest banks and a higher average rate for multinational banks with operations in high-tax countries and states may account for some of the difference However, the rest remains a puzzle

[3]For example, during the 1970-78 period, there was an average of 7,845 new issues of municipal securities with an average value of $7 million per issue By contrast, corporate bond issues over the same period averaged 493 new issues per year with an average value per issue of over $50 million (Robert Lamb and Stephen Rappaport, *Municipal Bonds The Comprehensive Review of Tax-Exempt Securities and Public Finance* (New York McGraw-Hill Book Company, 1980), page 8

holdings of long-term municipal securities. As a consequence, bank investment in municipals was modest relative to the municipals market and to the banks' own portfolios (Charts 1 and 2) By the end of 1960, banks held 25 percent of all municipals, but municipals represented only 8 percent of their financial assets [4]

The growth of markets for Federal funds and large CDs during the 1960s freed the banks from exclusive reliance on their securities portfolios as a source of liquidity.[5] With the liquidity constraint relaxed, other factors, such as relative yields and tax strategies, increased in importance as determinants of the municipal-to-asset ratio. Bank municipal holdings surged over this period to a peak of 15 percent of bank assets and 51 percent of all outstanding municipals by 1971, nearly double the levels of a decade earlier

During the 1960s, municipal bonds were essentially the sole vehicle by which banks could shelter their profits on domestic operations. The tax benefits of investment in physical assets were available in principle, but the use of leasing as a tax shelter did not begin in earnest until 1971. Through the early 1970s, banks' involvement in leasing increased rapidly and the municipal-to-asset ratio declined

This trend continued through the mid-1970s. By the late 1970s, however, the growth of leasing activity by commercial banks stopped, possibly owing to changes in tax laws. The decline in bank participation in the municipal market also slowed through the late 1970s with a municipal-to-asset ratio of 11 percent and with banks holding 43 percent of outstanding issues in 1978.

Most recent trends

Over the past four years, and particularly since 1981, almost all factors affecting the appeal of municipals discouraged bank investment.[6] The decline in the municipal-to-asset ratio continued in 1979, paused in 1980, and then accelerated. Banks, increasing the ratio by 1 percent in 1980, reduced it by almost 8 percent over 1981 and 1982. In the first three quarters of 1983, the share of municipals in bank financial assets fell another 7 percent.

Declining net aftertax yield

Even though the average *nominal* yield on municipals increased substantially after 1979, increases in bank costs and less favorable tax treatment of net income from municipals made the net aftertax yield on municipals much less attractive to banks [7]

Banks' need to shield profits from taxes has declined in the 1980s.[8] In 1981, bank pretax profits were flat after a decade of virtually continual growth. In the following year, profits declined by about $1 billion. Even though strictly comparable figures are not yet available, bank profits in general do not seem to have increased very much in 1983 In particular, it appears that gains some banks achieved in 1983 in the net yield of their loans and investments were at times offset by increases in loan loss provisions

Changes in Federal tax laws in the past four years have also had profound negative effects on the net aftertax yield of bank-held municipal securities.[9] The changes began in 1979 when the maximum corporate income tax rate was reduced from 48 percent to 46 percent This change lowered the tax shelter value of a municipal bond.

The greatest change was due to the 1982 tax act (TEFRA) That legislation disallowed part of the interest deduction for municipal carrying costs. Disallowance reduces the value of a municipal as a shelter against

[4]The discussion of the principal factors affecting bank municipal holdings through the mid-1970s is based largely on Herman Kroos and Martin Blyn, *A History of Financial Intermediaries* (New York Random House, 1971), Marcia Stigum, *The Money Market,* rev ed (Homewood, IL Dow-Jones-Irwin), 1983, John Petersen, "Changing Conditions in the Market for State and Local Government Debt" (U S Congress, Joint Economic Committee), April 16, 1976, and Ralph Kimball, "Commercial Banks, Tax Avoidance, and the Market for State and Local Debt Since 1970", *New England Quarterly Review* (Federal Reserve Bank of Boston, January/February 1977)

[5]Perhaps because the transition was so gradual from bank municipal demand primarily determined by liquidity restrictions to demand determined by a more diverse set of factors, empirical studies based on the 1950s and 1960s often concluded that bank demand for municipal securities was a residual In other words, banks first satisfied their demand for loans, Treasury securities, and other investments Whatever funds were left over were used to buy municipals An example of this residual approach to municipals is Donald Hester and James Pierce, *Bank Management and Portfolio Behavior* (New Haven Yale University Press, 1975) Patric Hendershott and Timothy Koch, "The Demand for Tax-Exempt Securities by Financial Institutions", *The Journal of Finance* (June 1980) provide an example of a later rejection of this approach once data for the 1970s became available

[6]In terms of Chart 4, the net aftertax yield line has moved down and to the left (line Y_1) and banks reduced their holdings from point 1 to point 2 In addition, bank holdings were further reduced to point 3 by a decline in bank demand for municipals at that yield (line D_1)

[7]The factors that Marcelle Arak and Kenneth Guentner, "The Market for Tax-Exempt Issues Why Are the Yields So High?", *National Tax Journal* (June 1983) argue had contributed to this increase in nominal yields are the same factors that made municipal securities less attractive to banks This may account, in part, for the substantial increase in municipal investment by individuals, whose net aftertax yield from municipals may have increased over this period

[8]Because banks must make their tax-shelter investment decisions well before actual taxable profits are known, they base their decisions on anticipated taxable profits Unfortunately for the analyst, anticipated taxable profits, the most relevant variable, is not directly observable But some inferences can be made by looking at banks' total actual profits before they paid taxes, as reported in the Board of Governors of the Federal Reserve System publication, *Reports of Condition and Income*

[9]While state taxes may be important to the return that a bank receives on a municipal security, preliminary investigation suggests that state taxes do not play an important role on average in explaining the share of assets which a bank holds as municipals (Appendix 2)

taxes on other bank operations. Specifically, as of January 1, 1983 banks have been able to deduct from taxable profits only 85 percent of the interest costs incurred to purchase municipals Municipals held as of the end of 1982, however, still benefit from the pre-TEFRA full deductibility Thus, while the net aftertax yield of bank holdings of municipals as of 1982 was not affected, the yield of purchases in 1983 was reduced, contributing to the absence of net bank purchases over the first three quarters of 1983 [10] For example, because of the disallowance, the yield in 1983 for purchases of municipals paying the recent market return and being financed by six-month CDs was almost 20 percent lower than it would have been with full deductibility of carrying costs

The net yield a bank can earn by investing in municipals has also been eroded in the last four years by a substantial increase in banks' interest cost of funds An annual survey by the Federal Reserve shows that, in general, banks' average cost of money rose from interest payments of less than 5 percent in 1979 to almost 8 percent in 1981 and 1982 Part of the reason for the increased costs was the general rise in interest rates after 1979. An additional factor in banks' cost of funds in recent years, and for years to come, has been the deregulation of the interest rates banks pay on deposits In 1981, interest-bearing transaction deposits became widely available for the first time at commercial banks In 1983, deposits paying market rates of interest were permitted in the form of transaction deposits (Super NOW accounts) and time and savings deposits (money market deposit accounts and CDs)

The increasing interest costs reduced the net aftertax yield a bank can earn from investing in municipal securities in two ways First, higher costs contributed to the reduction of taxable profits discussed earlier Second, they reduced the spread a bank could earn by borrowing money to invest in tax-exempt securities Even though the bank receives back some of the higher costs in the form of lower taxes through interest deductibility, it must still absorb more than half of the increase (1 – 0 46, the marginal tax rate)

For example, small banks, who acquire funds primarily through time deposits, saw their net aftertax yield on municipals decrease over 2 percentage points from 1979 to 1982 Large banks, who finance many of their assets through purchasing funds in the money market, saw their net aftertax yield on municipals decline by 1 to 2 percentage points [11] Because funds available to banks will increasingly require market rates of interest in future years, the erosion of the spread a bank can earn by investing in municipal bonds may continue

Reduced bank demand at a given yield

Large and small banks have been attracted away from municipals by several factors aside from the decline in yield, among them the availability of tax-sheltered leasing Tax law allows a high degree of leveraging of investment in physical assets so that banks receive the tax benefits associated with a $5 investment with only a $1 "equity" stake in the capital asset (Appendix 1) This magnifies the effect of accelerated depreciation and investment tax credits on the net aftertax yield from purchasing an asset to lease

Tax legislation in 1981 (ERTA) liberalized the leveraging requirements and increased the rate of cost recovery through depreciation. Some of the changes are subtle, and it is difficult to calculate their effect on average returns But it is likely that the provisions in ERTA made leasing more attractive to banks and contributed to the drop in bank demand for municipals

In fact, there is evidence that primarily large banks responded to these changes quickly by increasing their leasing activity substantially In 1982, the share of total operating income provided by leasing operations at the largest banks increased by over 10 percent (Chart 5). What makes the increase so impressive is that this measure probably understates the increase in bank leasing activity. Taxable lease income is a small part of the net aftertax yield from leasing, and it usually does not become sizable until at least a year after the lease arrangement begins. The largest and most immediate benefits from leasing are the tax credits and depreciation deductions which are not reflected in this measure [12]

On the other hand, the decline in small banks' demand for municipals was probably not influenced by this change in ERTA Small banks generally do not have the resources necessary to overcome some of the disadvantages of leasing First, small banks often may not

[10]This lowers the left portion of the yield curve in Chart 4 In addition, if part of its interest deduction is disallowed, the bank would have to increase its holdings of municipals in order to create enough deductions to shelter all its taxable profits, and the yield curve in Chart 4 will shift to the right If most banks were at the kink point in Chart 4, then the effect of TEFRA could have been to increase municipal holdings Because most banks do not hold enough municipals to cover fully their taxable profits, the yield effect of TEFRA probably dominates

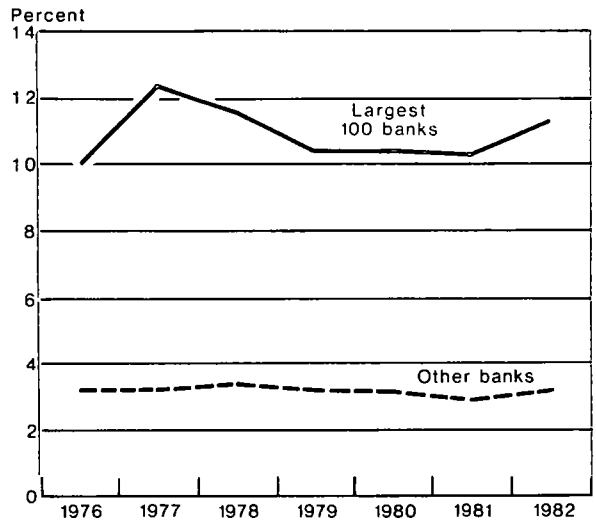
[11]Small banks absorbed 54 percent of the increase in time deposit costs from 6 4 percent in 1979 to 10 2 percent in 1982 as reported in the Federal Reserve Board of Governors publication *Functional Cost Analysis* The cost of nondeposit funds rose from 6 3 percent to 9 2 percent for medium banks and from 8 2 percent to 10 2 percent for large banks between 1979 and 1982

[12]Other attempts to measure the extent of bank leasing activity can be found in Ralph Kimball, *op cit*

Chart 5

Income from Lease Financing as a Share of Total Operating Income

By asset size



Source Board of Governors of the Federal Reserve System, Reports of Condition and Income

have large and diverse enough portfolios to absorb the greater risk and lower liquidity of leasing over high-grade municipal bonds. Second, leasing requires a specialized staff, which small banks generally cannot afford, and it is most efficiently done in volume As a result, small banks have engaged in relatively little leasing, and income from leasing has remained stable at about 0.3 percent of their total operating income

A second factor that reduced both large and small banks' demand for municipals at a given yield was the rapid and unpredictable change in interest rates from 1979 to 1982 Holders of substantial volumes of long-term fixed-interest bonds saw the value of their portfolios fluctuate substantially In this environment, banks became wary of investing in long-term fixed-interest securities, which constitute the majority of municipal bonds, and sought to reduce their interest risk exposure One way to do this was to shorten the average maturity of their municipal portfolios and thereby reduce their demand for a large proportion of municipals

The adverse impact of the increased appeal of leasing and shorter term securities may have been limited to some extent by the increasing availability of a special form of tax-exempt security known as an industrial development bond (IDB) Issuers of IDBs have pioneered the introduction of floating interest rates and medium-term maturities to enhance their appeal to spread- and liquidity-conscious investors.

Moreover, one type of the IDB—the small-issue IDB—often carries a special attractiveness to banks, not usually associated with traditional municipal bonds Small-issue IDBs have this appeal to small banks in particular because, in many ways, a small-issue IDB is merely a local business loan that is structured as a bond to achieve tax exemption for the interest earned Small banks are used to making commercial loans, so that they may feel particularly comfortable with small-issue IDBs As with loans, the terms are negotiated, the bond is held to maturity, and the bank often receives compensatory balances from the borrower

The desirability of these characteristics to all investors, and presumably to banks as well, is suggested by the increasing popularity of all IDBs Although they presently account for only 18 percent of outstanding tax-exempt bonds, IDBs have grown from less than 1 percent of the net increase in long-term municipal bonds in 1971 to more than one third since 1979, according to the Federal Reserve Board's *Flow of Funds*

A final factor that has contributed to declining bank demand for municipals is the increase in credit risk associated with holding municipal securities in the last few years Unlike Federal Government securities, there can be interruptions in the payment of principal or interest on municipal securities Although the probability of default may be small, bank perceptions of the riskiness of municipals may have increased As a response, banks may have kept unchanged or even lowered their portfolio exposure limits for municipals

Recently, many investors, including banks, have seen the value of some of their municipals decline because of default or a downgrading of their credit rating The most famous default recently, and the largest tax-exempt default ever, has been in the municipal bonds supporting WPPSS Projects 4 and 5 Unfortunately, there are few data available to support or to refute the widespread notion that credit risk is greater now than five years earlier Two indicators of increased risk are that Moody's Investors Service has reduced the number of investment grade-rated bonds and that more issues have had their ratings reduced than increased by Moody's for the last five years [13]

A bank may try to minimize losses due to higher credit risk by shifting its portfolio to higher quality municipals, or it may choose to reduce municipal exposure and, consequently, to reduce its demand for tax exempts The first option has become increasingly difficult because of

[13]Robert Lamb and Stephen Rappaport, *op cit*, pages 70-71, and Moody's Investors Service

the greater scarcity and expense of the top-grade municipal bonds. In 1978, eighteen states issued securities rated Aaa. By 1983, only twelve states did. Moreover, top-rated municipal securities have become increasingly expensive relative to riskier, minimum investment grade municipals A bank had to forego a yield 14 percent higher if it wanted Aaa-rated municipals rather than Baa-rated municipals at the end of the 1970s. By 1982, this loss in yield increased to 15 percent of the Aaa rate and reached 17 percent in 1983. Faced with these difficulties in upgrading their portfolios, many banks may have opted in part to reduce their risk exposure and, consequently, their demand for municipal bonds.

In addition, demand for municipals may also have declined because some banks are choosing to take a portion of their municipal exposure in the form of letters of credit rather than ownership of municipal securities. As part of an effort to improve the creditworthiness of their debt, some issuers are asking for and receiving irrevocable bank letters of credit as a form of insurance that interest or principal will be paid to investors These letters of credit earn banks a fee, but they do not tie up funds as investment in a municipal security would However, banks which consider these letters of credit to be municipal exposure may reduce the amount of municipals they are willing to own. There are some estimates that, as of mid-1983, as much as $40 billion in letters of credit had been written by the largest banks as backing for municipal bonds. A portion of this may have displaced bank demand for municipals

In summary, since 1981 virtually all factors have worked against bank demand for municipal bonds. The net aftertax yield of a bank-held bond has been reduced by a decline in bank profits needing shelter, a decline in the tax rate and the deductibility of municipal carrying costs, and a rise in the cost of financing investments in municipals. This was offset, but not entirely, by an increase in nominal yields. In addition, bank demand for municipals at that yield was reduced by an increase in the attractiveness of tax-sheltered leasing as well as increases in the interest risk and credit risk of holding traditional long-term fixed-interest municipals. However, demand may not have declined for some industrial development bonds whose similarity to loans, shorter maturity, or interest flexibility could limit some of these effects.

Next several years

A continued sharp decline in commercial bank investment in municipal securities is not likely Virtually all the factors affecting bank demand contributed to the post-1981 drop in bank participation, but the probability of so many separate factors combining adversely again is not high. And some factors may actually have begun to move in more favorable directions.

- First, among the limitations to bank profit margins were increasing costs of funds fostered by deregulation of depository interest rates and loan loss provisions occasioned by changes in world economic conditions. Both of these should be one-time adjustment costs that probably will not recur for some time.

- Further decreases in income tax rates or enhancements in the appeal of tax-sheltered leasing are improbable If either are changed, it is more likely to be in a direction that will raise tax liabilities and enhance the appeal of municipal securities. In contrast, the erosion of the tax-shelter benefits of municipal bonds could continue as part of Federal efforts to increase tax revenues Proposals to restrict certain types of revenue bonds have recently been introduced, or possibly the 85 percent limit on carrying cost deductibility could be further lowered.

- Although one cannot predict changes in the credit risk of municipal issuers, there has been a noticeable expansion of techniques to reduce this risk for investors, primarily through insurance and other innovative forms of payment guarantees.

Despite the low probability of a continued decline in commercial bank participation in the municipal market, a reversal of the effects of the post-1981 period would require substantial changes in the financial, regulatory, and Federal tax environment. The specific adjustments have yet to be discovered, yet they will have to encompass some combination of the following conditions:

- A financial environment in which long-term fixed-income securities become much more attractive than they are now;

- A wider spread between municipal yields and banks' cost of funds;

- A higher level of bank profitability;

- An increase in marginal corporate tax rates;

- Tax law changes that reduce the attractiveness of leasing while increasing the attractiveness of municipal bonds.

It is possible, but unlikely, that a sufficient combination of these changes will occur in the foreseeable future [14]

[14] A recent IRS opinion acquiescing to an earlier Tax Court decision granted favorable tax treatment for repurchase agreements (RPs) backed by municipal bonds It remains to be seen, however, whether this opinion will create a new source of demand for tax-exempt securities

Nonetheless, state and local governments have many options available to enhance the marketability of their bonds to banks. Taking a cue from the appeal of industrial development bonds, they might reduce the maturities and increase the flexibility of interest rates of more traditional municipal bonds to enhance their appeal to banks.

Allen J. Proctor and Kathleene K Donahoo

Appendix 1: The Returns on Leasing and Municipal Bonds Compared

Under current law, equipment leasing dominates municipal bonds, in terms of rate of return, as an investment for a profitable bank. To understand this, consider a bank with taxable income in need of sheltering. The bank has borrowed $1 and is deciding whether to buy a municipal bond with the dollar or to invest in a dollar's worth of equipment to lease The bank will choose the investment with the greatest net present value (NPV) of aftertax returns.

In both cases the interest cost of the borrowed dollar will be written off for tax purposes against current operating income. For the bond, however, only a proportion — (1-α), $0 \leq \alpha \leq 1$ — can be deducted Under current law $\alpha = 0.15$.

For a municipal bond with the face value of $1 purchased at par, the NPV is.

Equation 1

$$NPV_B = \sum_{t=1}^{T} \frac{r_{ex} + (1-\alpha)\mu r_c}{(1+r_c)^t} + \frac{1}{(1+r_c)^T}$$

where: r_{ex} = Coupon yield on the exempt bond,
r_c = Cost of funds to the bank,
μ = Marginal corporate tax rate, and
T = Term of maturity of the bond in years.

For a lease of a durable good with a useful life of T years and no scrap value at the end of that period, the NPV is roughly

Equation 2

$$NPV_L = \sum_{t=1}^{T} \frac{r_{tx}(1-\mu)+\mu r_c}{(1+r_c)^t} + 5\mu \sum_{t=1}^{P} \frac{\delta(t)}{(1+r_c)^t} + 5k$$

where: r_{tx} = Rental income,
$\delta(t)$ = Proportion of the value of the asset allowed as a depreciation deduction t years after the investment,
k = Proportion of the value of the asset allowed as an investment tax credit, and
P = Period over which depreciation may be taken

The benefits of accelerated depreciation and the investment tax credit are multiplied by five because current minimum "at risk" provisions require an investment of only 20 percent of the cost of the asset The remainder can be borrowed. Current "at risk" requirements, then, mean that a bank can issue a CD for $1, borrow another $4 from an institution with little or no tax liability (*e g*, a life insurance company or a local government agency), purchase a $5 investment, and claim the full tax benefits associated with that investment.

Given these considerations, under what circumstances would a bank choose to purchase a municipal bond rather than enter an equipment leasing arrangement? The bank would be indifferent if equation 3 is:

$$NPV_B = NPV_L$$

Data for computations of r_{ex} are based on equations (1), (2), and (3) and on the 1982 average values of the following variables.

r_c = Six-month rate on large CDs in the secondary market (12.57 percent),
r_{tx} = Yield on Baa corporate bonds (16 11 percent),
T = Ten years
P = Five years under the accelerated cost recovery (ACR) provisions of ERTA.

Appendix 1: The Returns on Leasing and Municipal Bonds Compared *(continued)*

Under these assumptions and with these variable values, the yield on municipal bonds would have to equal 42.25 percent to equal the rate of return on leasing This is a little less than four times the average annual yield of 12 48 percent on Aaa-rated tax-exempt bonds in 1982. Of course, comparison of rates of return does not reveal the whole story. Leasing arrangements are probably riskier and less liquid investments than municipal bonds However, the computation indicates that there are attractive alternatives to tax-exempt securities for banks wishing to shelter operating profits.

A series of experimental calculations with alternative variables and parameters indicated that the key provisions of current tax law affecting the attractiveness of leasing are the minimum at-risk investment requirements If the tax benefits of a leasing arrangement were limited to the bank's direct "equity" investment in the equipment, instead of up to five times that investment, then the r_{ex} required to match the benefits of leasing would be only 11.70. Our calculations suggest, therefore, that modifications of the at-risk requirements for investment tax benefits can have an important effect on banks' demand for municipal bonds.

Aaron S. Gurwitz

Appendix 2: Some Characteristics of Municipal Bond Market Segmentation

The municipal bond market has been characterized as geographically segmented. There are two reasons to expect that banks' municipal-to-asset ratio will differ systematically across states.* First, the municipal bond market consists of a large number of relatively small issues, many of which are sold on a negotiated rather than on a competitive basis. A close relationship frequently develops between a local government and the banks or other institutions buying its debt. To the extent that accommodating state and local government borrowing requirements is a major determinant of bank municipal holdings, one would expect the municipal-to-asset ratio to be higher in the states that are the largest borrowers

Secondly, bank income from in-state municipals is exempt from taxation in some states but is subject to taxation in other states. Banks in states which exempt bank income from in-state municipals would likely have higher proportional municipal holdings.

Analysis of sixteen states categorized by total state and local debt and tax treatment of banks' municipal income does not indicate a clear relationship between

*The mandatory pledging of municipal securities as collateral for state and local government deposits in banks was formerly an important reason for state-by-state differences in bank demand for municipals but not after 1978 For a discussion of other factors that may cause demand for municipals to vary by state, see Robert Lamb and Stephen Rappaport, *Municipal Bonds The Comprehensive Review of Tax-Exempt Securities and Public Finance*

Table 1

1982 Municipal Holdings of U.S. Commercial Banks by State

Municipal holdings as a percentage of total domestic assets

High debt states*	Percent	Low debt states*	Percent
		Taxable municipal interest†	
New York	4 9	Montana	11 0
California	3 2	New Mexico	10 3
Pennsylvania	9 9	South Dakota	6 6
Florida	10 3	North Dakota	10 7
Average	7 1	Average	9 6
		Tax-exempt municipal interest†	
New Jersey	9 4	Vermont	9.3
Michigan	8 9	Maine	11 7
Oregon	9 6	New Hampshire	8 1
Virginia	10 8	Utah	7 4
Average	9.7	Average	9 1

*High debt states had outstanding total debt in 1980 greater than $5.5 billion Low debt states had outstanding total debt in 1980 less than $2 0 billion

†Taxable and tax-exempt refer to states' treatment of bank municipal income from in-state municipals as of 1983

Appendix 2: Some Characteristics of Municipal Bond Market Segmentation *(continued)*

Table 2

1982 Municipal Holdings of U.S. Commercial Banks by State and Asset Size

Municipal holdings as a percentage of total domestic assets

Category	Percent
All banks	8 3
*Top 100	5 6
Other	10 4
All banks (excluding New York and California)	9 9
*Top 100	8 0
Other	10 7
All New York banks	4 9
*Top 100	4 4
Other	8 5
All California banks	3 2
*Top 100	2 6
Other	5 9

*Banks among the nation's 100 largest in asset size as of 1982

Sources for Tables 1 and 2 Board of Governors of the Federal Reserve System, *Reports of Condition and Income*

these two factors and banks' municipal-to-asset ratios In general, the differences between municipal ratios within categories are at least as great as those across categories.

The average municipal-to-asset ratios for three of the four categories are extremely close 9.7 percent for tax-exempt and high debt states, 9 6 percent for nonexempt and low debt states, and 9 1 percent for tax-exempt and low debt states (Table 1) The nonexempt and high debt states' average ratio of 7 1 percent is somewhat smaller, but much of this difference is due to the ratios in New York and California

The New York and California ratios are much lower than those of any other nonexempt state studied here It therefore seems likely that factors other than state tax treatment of banks' municipal income must account for the relatively low municipal ratios of banks in those two states

One explanation of the low municipal-to-asset ratios in New York and California is that these states contain a disproportionate number of very large banks, and that large banks tend to hold a smaller proportion of their assets in the form of municipals (Table 2) Comparison of municipal holdings of large and small California and New York banks with similar banks in the other 48 states reveals that disaggregation by size lessens the difference between the New York and California ratios and those of the rest of the country Thus, some of the difference between the ratios of New York and California banks and those of all other U S banks is due to a size effect—California and New York have a high concentration of very large banks However, there remains some residual state effect

In sum, regardless of the greater availability of local municipal issues and greater tax incentives to hold municipal bonds, banks in most of the states studied hold remarkably similar proportions of their assets in municipals. Geographic segmentation of the municipal market may exist in some form, but it does not seem to affect the proportion of their assets which banks hold as municipals

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