BY THE U.S. GENERAL ACCOUNTING OFFICE

Report To The Chairman, Subcommittee On Economic Stabilization, Committee On Banking, Finance And Urban Affairs House Of Representatives

Trends And Changes In The Municipal Bond Market As They Relate To Financing State And Local Public Infrastructure

Changes in the structure of the municipal bond market over the past decade have contributed to increased borrowing costs for State and local governments. The key structural changes include

--the sharp increase in the volume of municipal bonds sold since 1979 and

--a shift in the type of investor in municipal bonds from institutional buyers to household buyers.

These increased borrowing costs have contributed to reduced investment in public infrastructure. GAO found that $3.9 billion in planned bond sales were cancelled or postponed in 1982 because of changing interest rates. GAO estimates that of this total $1.9 billion in delayed or terminated financings adversely affected the progress of infrastructure projects. These cancellations and postponements represented about 5 percent of issues actually marketed to finance public capital facilities.

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WASHINGTON D.C. 20548

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The Honorable John J. LaFalce
Chairman, Subcommittee on Economic
Stabilization
Committee on Banking, Finance
and Urban Affairs
House of Representatives

Dear Mr. Chairman:

This report was requested by the former chairman of the Subcommittee on Economic Stabilization. The report reviews the trends and changes that have occurred in the long-term municipal bond market since 1970 and examines the role of municipal bonds in financing State and local public infrastructure. It identifies several factors that contribute to higher interest costs notwithstanding cyclical changes in the economy.

As requested by his staff, we did not obtain agency comments. Copies of this report are being sent to cognizant committees and the Secretary of the Treasury.

Sincerely yours,

Arthur J. Corazzini
Acting Director

U.S. GENERAL ACCOUNTING OFFICE
REPORT TO THE CHAIRMAN,
SUBCOMMITTEE ON ECONOMIC
STABILIZATION
U.S. HOUSE OF REPRESENTATIVES

TRENDS AND CHANGES IN THE MUNICIPAL BOND MARKET AS THEY RELATE TO FINANCING STATE AND LOCAL PUBLIC INFRASTRUCTURE

D I G E S T

Tax-exempt municipal bond interest rates reached an historic high of 12.84 percent in January 1982, primarily because of prevailing general economic conditions. However, since that time, interest rates in general have declined while municipal bond interest rates have remained relatively high. Changes in the structure of the market have contributed to the persistance of high real rates, and the high rates may continue to adversely affect State and local investment in infrastructure.

This report was prepared at the request of the Subcommittee on Economic Stabilization of the House Committee on Banking, Finance and Urban Affairs. It describes the significant structural changes that have occurred in the municipal bond market since 1970, relates them to the rise in interest rates, and analyzes the effects higher interest rates have on the financing of State and local infrastructure. To identify the most significant changes, GAO interviewed nearly 100 market observers and participants, including State and local bond issuers, credit analysts, bankers, underwriters, and experts. GAO's analysis of the effects of increased interest rates is based on data provided by the Federal Reserve and the Public Securities Association.

Municipal bonds are State and local debt obligations. Until fairly recently, they have been used primarily to finance State and local public infrastructure, such as roads, bridges, schools, and sewer and water systems. In 1982, a record $77.3 billion in long-term bonds were sold in the municipal bond market.

The importance of the municipal bond market as a source of finance for State and local infrastructure varies, depending in part on the availability of other funding sources, such as Federal aid and current local revenues. During the 1970s, Federal aid doubled as a source of infrastructure finance. However, recent cutbacks in Federal grants for infrastructure

and the deterioration of State and local fiscal conditions have increased the importance of the municipal bond market as a source of infrastructure finance. The current municipal market, however, is quite different from the way it was in the early 1970s, and some analysts are concerned that the structural changes that have occurred in the market may contribute to a continuation of higher interest rates and delays in needed State and local infrastructure projects.

The two most significant structural changes have been the increase in the demand for loanable funds (supply of municipal bonds) and the decrease in the supply of loanable funds (demand for municipal bonds) by institutional investors. While GAO examines the causes of these shifts in supply and demand it does not attempt to measure precisely the extent to which these structural changes affected interest costs because of the complex interaction between them and changes in the general economy.

SHARP RISE IN VOLUME OF MUNICIPAL BONDS

The annual volume of long-term municipal bonds has risen sharply over the past 4 years, from $43.3 billion in 1979 to $77.3 billion in 1982. This has occurred despite record high interest rates. The most important factor contributing to this increase has been the rapid growth in the use of tax-exempt bonds for non-traditional purposes.

In 1970, over 95 percent of the $18.1 billion in municipal bond issues was used to finance traditional public infrastructure. By 1982, such use dropped to only 48 percent of new issues. In the past decade, the tax-exempt market was increasingly used to finance non-traditional endeavors, such as multiple and single family housing, industrial development, private hospitals, acquisition of pollution control equipment by private industry, and student loans. In 1982, an estimated $43.4 billion in new bonds were sold to finance these activities.

Other changes in the market directly related to the increase in the volume of municipal bonds include

--changes in the types of governmental units issuing bonds,

--a shift in the type of bonds being sold from general obligation to revenue bonds, and

--a shift from the use of competitive bids by issuers to market their bonds to the use of negotiated sales.

Combined, these changes are believed to have contributed to higher interest rates.

THE TYPE OF INVESTOR IN MUNICIPAL BONDS IS CHANGING

Buying patterns in the municipal bond market have shifted from institutional to individual investors. Much of this shift is attributed to changes in investment priorities and changes in the tax code, which are claimed to have resulted in reduced attractiveness of bonds to institutional investors. These changes are believed to have contributed to higher interest rates because to successfully market bond offerings without heavy institutional interest, individual investors with relatively low marginal tax brackets must be attracted.

The major attraction of the market is the tax-exempt feature of its securities. Traditionally, property and casualty insurance companies, commercial banks, and individual households have dominated the municipal bond market. The biggest buyers of municipal bonds since the mid-1960s were banks. In 1970, they held 49 percent of outstanding municipal bonds. However, in recent years, commercial banks have reduced their purchases of municipal bonds because of decreased profits, the development of alternative investment opportunities, and changes in Federal tax policies that reduce some of the relative investment advantages of tax-exempt securities. In 1982, banks held 34 percent of outstanding bonds.

The decline in the role of commercial banks in the new-issue market has been offset by increased participation by individual investors. In 1982 households purchased about 87 percent

of new issues. A market dominated by household investors is typically more volatile than an institutional market because household investment is influenced by the need to attract investors in varying, but generally lower, marginal tax brackets.

RESULT OF INTEREST RATE INCREASES

Long-term changes in the supply and demand of municipal bonds, in combination with recent economic conditions, have resulted in higher interest rates. These higher interest rates have adversely affected the abilities of States and localities to bring both traditional and non-traditional new bond issues to the market. This, in turn, has contributed to reduced levels of investment in planned State and local construction and other endeavors.

GAO's analysis of the increased volume of delayed and cancelled proposed bond sales shows it to be directly related to rising interest rates. In 1981, $7.2 billion in planned bond sales were cancelled or delayed. This was equivalent to 15 percent of long-term bonds actually sold. As rates began to drop in 1982, the volume of cancelled or delayed bonds dropped to $4.0 billion of long-term sales.

In addition to increased delays or cancellations of planned bond sales, increased interest rates have taken a bigger bite of borrowed funds. In 1970, 21 percent of debt service was dedicated to interest repayment. By 1981, this increased to 33 percent. Increased interest costs reduce the amount of borrowed funds available for new capital construction bonds.

CONCLUSIONS

While current economic conditions have increased interest rates throughout the economy, interest rates in the tax-exempt bond market have remained high in relation to the taxable bond market. Structural changes in the market over the past decade have contributed to these relatively higher rates. Higher interest rates have, in turn, contributed to a greater number of delayed or cancelled bond sales. In addition, higher interest rates have resulted

in a larger share of State and local debt service being dedicated to the payment of interest instead of principal. Increased delays, cancellations, and interest costs have combined to contribute to lower investment in general, including reduced investment in State and local infrastructure.

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CHAPTER 1

INTRODUCTION

Historically, two-fifths of all outlays for traditional forms of State and local public infrastructure [1]/ were financed through the long-term municipal bond market. [2]/ Changes in this market, the national economy, and Federal policy over the past decade, however, have resulted in higher interest rates and a relative decrease in the use of the bond market as a source of finance for traditional infrastructure projects. Paradoxically, even though investment and borrowing for traditional infrastructure has declined for most of the past decade, in constant dollar terms, the municipal market itself has experienced record sales volumes even in the face of record high interest costs.

GENERAL CHARACTERISTICS OF THE MUNICIPAL BOND MARKET

The municipal bond market is often referred to as the "tax-exempt" securities market because the interest paid on these obligations, both long-term bonds and short-term notes, is exempt from Federal income taxes and is often not taxed by States or localities. [3]/ Municipal securities are also characterized by a high degree of investment safety, according to credit analysts, and a wide variety of individual issues. [4]/

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[1]/We define traditional public infrastructure as structures and equipment owned by States and localities. This includes highways, bridges, buildings, mass transit systems, and public utilities (water, sewer, power).

[2]/The "municipal" bond market includes debt instruments issued by States, counties, cities, school districts and other jurisdictions, such as water and sewer authorities. The term often encompasses other forms of tax-exempt securities issued by public jurisdictions on behalf of selected private purposes, such as economic development and single family housing loans. Appendix I contains a glossary of bond market terms used in this report.

[3]/The tax-exempt feature of the municipal bond is provided in Section 103 of the Internal Revenue Code of 1954. The exemption has been a feature of the tax code since the income tax system was created in 1913. Proponents of the feature claim there is a strong constitutional basis for the Federal exemption. Their argument rests on the doctrine that the Federal Government cannot interfere with, nor tax, States and localities.

[4]/For a comprehensive description of the municipal bond market, see Lennox L. Moak, Municipal Bonds: Planning, Sale and Administration, Municipal Finance Officers Association, 1982.

Because there is no tax on the interest paid on municipal securities, a State or local issuer generally borrows at lower interest rates than those paid by corporate issuers of securities (historically about one-third less). As a result, investors with a high tax liability may, under certain circumstances, earn more from these investments than they could from taxable securities. This is because the interest rate ultimately established on a municipal offering is that which attracts investors whose tax bracket is the lowest. In other words, if it is necessary to attract investors with a 30 percent marginal tax bracket so that an issue can be sold out then all those with higher marginal tax brackets who buy the issue will earn more than they could on taxable issues, other things being equal.

A second characteristic is relatively high investment safety. However, the New York City fiscal crisis in 1975-76 and the impending default on $2.25 billion in bonds issued by the Washington Public Power Supply System (WPPSS) may have impaired the perceived safety of tax-exempt investments. Some analysts believe that the City's fiscal crisis has continued to be a factor in the general rise in municipal interest rates. Meanwhile, some analysts believe the WPPSS default will only affect interest rates in the Northwest.

Third, the municipal market tends to be complicated and diverse. Most municipal bonds are sold as serial bonds with each series bearing its own interest rate and date of maturity. Thus a municipal bond issue is actually a bundle of issues, each carrying its own coupon, amount, and maturity. It is estimated that about 52,000 political entities have debt outstanding, with a total of about 1 1/2 million separate issues. In contrast, the corporate market has only about 6,000 issues of stocks and bonds outstanding. Because trading in an individual municipal issue may be infrequent, municipal securities have no organized exchanges where securities are listed and traded. Instead, hundreds of direct wires exist between municipal trading firms. In addition, the "Blue List," a service of Standard and Poors Corporation, daily lists public offerings by dealers; but, it is estimated that the list accounts for only 30 to 40 percent of municipal securities available in the national secondary market.

In addition to the market being decentralized, it is quite large. Over $450 billion in municipal debt was outstanding at the end of 1982. New offerings of publicly reported long-term bonds that year reached a record high of $77.3 billion. Because about $17 billion in debt was retired, the net increase was $60.7 billion. [5]/ In 1981, new long-term issues in the municipal market surpassed the total volume of new corporate fixed income securities (preferred stock and bonds).

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[5]/Volume figures in this report are based on data collected by the Public Securities Association, the national trade organization of bond dealers and dealer banks that underwriter, trade,

Forms of debt instruments used

Municipal securities are sold both in the long-term market, with maturities ranging from 1 year to beyond 40 years, and in the short-term market, with maturities extending from several days up to 1 year.

Municipal obligations are also of two major types, on the basis of the security pledged for repayment: general obligation bonds, which are backed by the full faith and credit--the taxing power--of the issuing government, and revenue bonds, which are secured by the revenues or receipts of a project (e.g., highway tolls) or a special fund rather than the full taxing powers of a borrower.

Primary and secondary markets

The primary market is where new municipal debt offerings are sold. In 1982, there were 9,340 publicly reported new offerings. For a general obligation issue to reach this market, in many cases it must be approved by the voters (revenue bonds generally do not require this approval). After an issue is authorized, the issuer has the choice of negotiating the sale with an underwriter or selling it competitively. The issuer determines how long maturities should run, the form of debt service, etc. and submits this information to underwriters and bond rating agencies. If sold competitively, underwriters then bid for the securities competitively and, if successful, will reoffer securities to investors. In the case of a negotiated transaction, the issuer selects an underwriter who then works out the features of the issue and reoffers the securities to investors.

The secondary market refers to all transactions in an issue that occur after the original underwriting and sale. Data on the size of the secondary market for State and local debt are scarce since the market is conducted over-the-counter (that is, securities are not listed or traded on any formal exchange). One analyst suggests the dollar volume of this market may be twice the size of the primary market.

Credit ratings

Because of the large number of new State and local issues that come to market, assessments of the quality of their creditworthiness is important to bond buyers. The two key advisory services whose systems of ratings are used throughout the country

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and sell public securities. These figures do not include an unknown volume of bonds that are privately placed and never publicly reported. Under provisions in the 1982 Tax Act, these data will be collected and reported for the first time next year.

are Standard and Poor's and Moody's Investor Service. These services rate the relative investment qualitites of municipal securities for a fee. This rating affects the eligibility of these securities for purchase by institutional investors and influences the interest rate a jurisdiction must pay on its bonds and notes. Moody's ratings, ranging from highest to lowest, are Aaa, Aa, A, Baa, Ba, B, Caa, Ca, and C. Standard and Poor's rating scale is somewhat similar: AAA, AA, A, BBB, BB, B, CCC, CC, C, and D. Many institutional investors may only invest in the top three or four categories of these ratings.

Uses of municipal debt

In 1982, bonds and notes were used for a wide variety of purposes, extending from traditional uses, such as schools, roads, and bridges, to less traditional purposes, such as single family residential mortgages and student loans. Table 1 shows the variety of uses by major category.

Who borrows, who buys

Over half of all tax-exempt borrowers are statutory authorities and special districts. These borrowers generally are headed by appointed decisionmakers and have come to dominate the market in recent years (see chapter 2). State governments borrow only about 10 percent of total long-term debt. The remainder is borrowed by localities and school districts.

Since the mid-1960s three categories of investors have dominated the municipal securities market. Of the $450 billion of municipal debt outstanding at the end of 1982, commercial banks held about 34 percent, property and casualty insurance companies held 19 percent, and households held 36 percent.

The relative importance of each of the three major investors has shifted over the years. Through the 1960s, commercial banks bought two-thirds of all new municipal issues. In the 1970s, they absorbed less than one-third. Property and casualty insurance companies absorbed much of the slack. More recently, the market has been dominated by individual investors. (Again, see chapter 2 for a more detailed discussion.)

USE OF THE BOND MARKET TO FINANCE TRADITIONAL INFRASTRUCTURE DECLINED, BUT THIS TREND IS REVERSING

States and localities have traditionally financed their capital investment needs through the tax-exempt securities market, Federal aid, and other local resources. While it is difficult to determine the exact proportion of funds specifically used for

Table 1

Municipal Securities
Sold in 1982, By Purpose

Use of Proceeds	Billions Sold	Percent of Total
Bonds		
Education	$ 6,258.0	8.6%
Transportation	6,239.4	8.5
Water & Sewer	5,027.8	6.9
Gas & Electric	7,132.0	9.8
Housing	14,344.1	19.6
Industrial Development	2,487.7	3.4
Pollution Control	5,263.3	7.2
Hospitals	9,502.9	13.0
Other a/	16,784.6	23.0
Total b/	$73,039.8	100.0%
Notes		
Urban Renewal	$ 158.7	0.4%
Local Housing Authorities	26,590.9	59.5
Tax and Revenue Anticipation Notes	10,875.0	24.3
Bond Anticipation Notes	3,940.2	8.8
Other c/	3,142.1	7.0
Total	$44,706.9	100.0%

a/"Other" bonds include multi-purpose bonds, recreation bonds, and public services.

b/Excludes refundings and advanced refunding of outstanding bond issues totaling $4.2 billion.

c/"Other" includes short-term "innovative" financing techniques.

SOURCE: Public Securities Association. Appendix VI, table 18, provides different estimates of certain categories based on other data sources.

capital investment, the relative contribution of each financing source can be estimated. [6]/ Figure 1 shows the estimated amount of funds contributed by these three sources between 1970 and 1981 (the most recent year for which data are available).

In 1970, the municipal bond market financed 54 percent of outlays for infrastructure. Federal grants financed 24 percent, and this share grew to 44 percent in 1978. By 1981, the role of the bond market had changed dramatically. It financed 29 percent while Federal grants for infrastructure financed 35 percent of the total. Current revenues increased as a share of the total. It is believed that the increase in current revenues is primarily due to cyclical conditions in the credit markets. [7]/

OBJECTIVES, SCOPE, AND METHODOLOGY

The Subcommittee on Economic Stabilization, House Committee on Banking, Finance and Urban Affairs, asked us to review the relationship between recent changes in the municipal bond market and the financing of State and local infrastructure. Our objectives were to identify the significant changes that have occurred in the municipal bond market since 1970 and to link the effects of these changes to the use of the bond market as a source of infrastructure financing.

We do not assess the magnitude of the infrastructure financing problem, nor do we examine other forms of infrastructure finance. Additionally, we did not attempt to quantify the costs of each of the individual changes in the market as they relate to infrastructure financing because of the methodological problems that type of analysis entails.

We examined national historical data trends since 1970, drawing from a variety of sources. Our primary data sources were the U.S. Census Bureau, the U.S. Bureau of Economic Analysis, the Federal Reserve Board, and the Public Securities Association, a professional organization representing the public securities industry. We also interviewed nearly 100 market observers or participants, including State and local bond issuers, credit analysts, bankers, underwriters, bond counsels, and experts.

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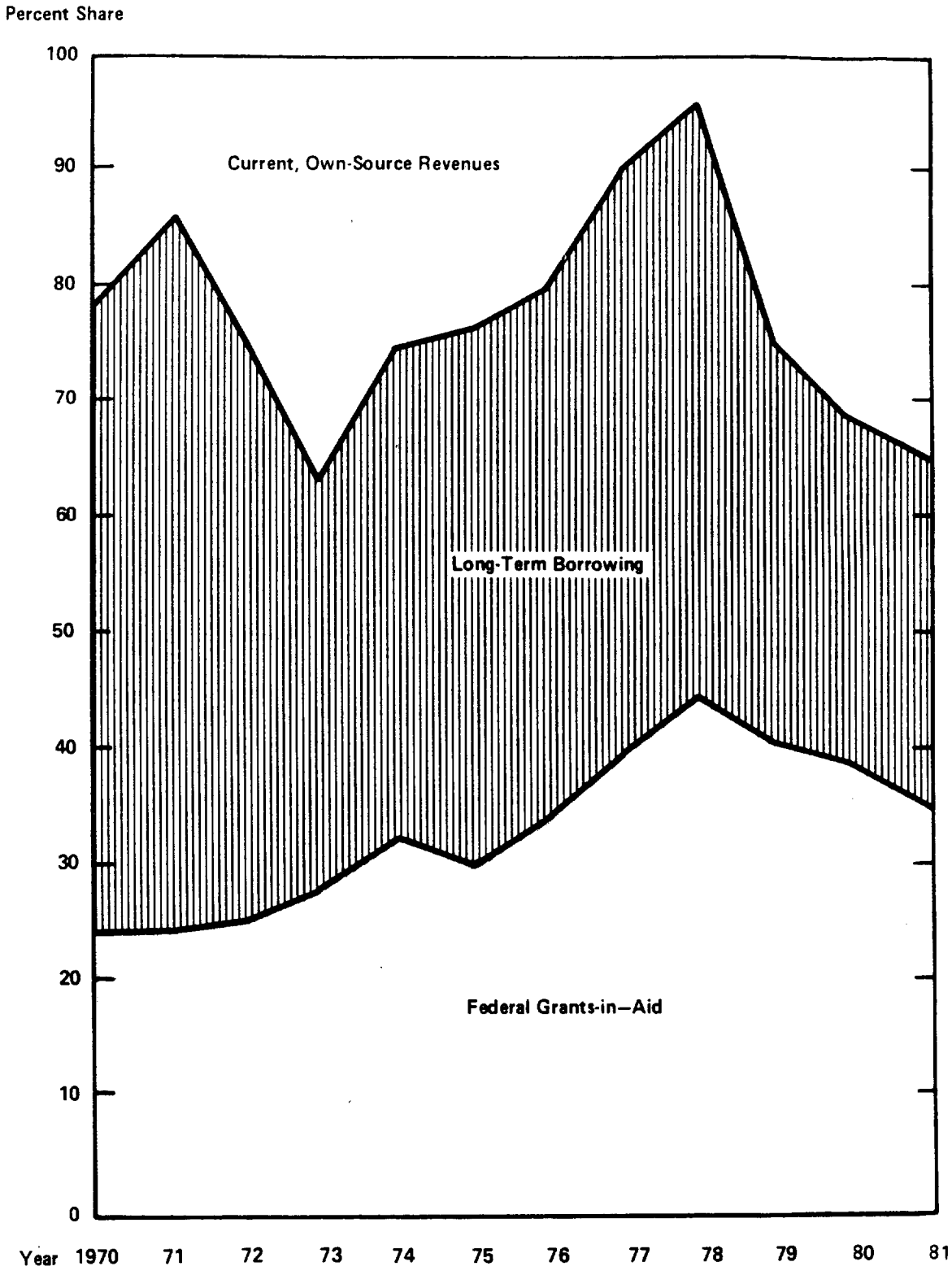
[6]/Exact proportions are not possible because data are from different sources and encompass slightly different time frames (see Appendix II for these limitations on our estimates), and because of the possibility of fungibility among different sources of funds (although bond restrictions limit the degree to which this might occur among borrowed funds). See also, CONSAD, A Study of Public Works Investment in the United States, for the U.S. Department of Commerce, 1980, p. I.82.

[7]/George Peterson, "Financing the Nation's Infrastructure Requirements," a paper presented before the National Academy of Sciences and Academy of Engineering (February 1983), p. 16.

Figure 1

Percent Composition of State and Local Infrastructure Financing Sources



Source: see appendix II

In the next chapter, we identify the recent structural changes that have occurred in the municipal bond market. Chapter 3 examines the effects that higher interest rates, stimulated by structural changes and changes in the general economy, have on the financing of public infrastructure.

CHAPTER 2

STRUCTURAL CHANGES IN THE MUNICIPAL BOND MARKET

Interest rates in the municipal bond market reflect general economic conditions and conditions peculiar to the market itself. General economic conditions, which affect all credit markets, include inflation, inflationary expectations, and Federal Government policy, especially with respect to the money supply and the relationship between Federal expenditures and revenues. General economic conditions tend to be cyclical, and cyclical phenomena are by definition non-enduring. For the most part, interest rates in municipal bond markets rise and fall generally in the same way as interest rates over the course of the business cycle.

However, between 1978 and 1982, interest rates on Aa-rated municipal bonds rose faster than rates for Aa-corporate bonds, and in recent months, interest rates on municipal bonds have not declined as much as rates in other bond markets. Even though the peak interest rate for Aa-rated municipal bonds, 12.48 percent in January 1982, was below that of equivalently rated corporate bonds, [1]/ the spread between the two rates remained narrow by historical standards.

STATE AND LOCAL BORROWING COSTS HAVE RISEN RELATIVE TO CORPORATE BORROWERS

The ratio between the interest on municipal bonds versus the interest on corporate bonds is one measure of the relative attractiveness of municipal bonds. Since the mid-1960s, the municipal bond interest rate has averaged about 70 percent of the taxable bond rate for Aa-rated bonds (the difference being the value of the tax exemption to the investor). In 1982, the ratio averaged 78.5, which, with the exception of 1969, was the highest since 1959. [2]/ (See figure 2.)

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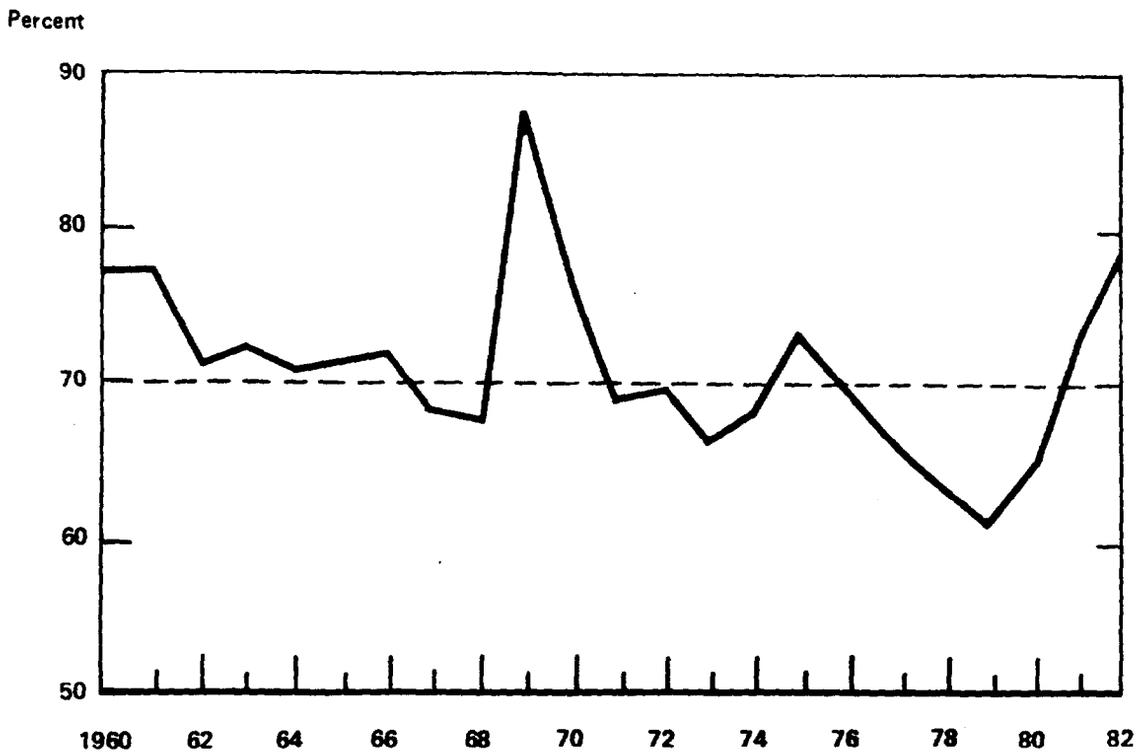
[1]/For the individual investor in the 50 percent income tax bracket, 12.48 percent is equivalent to a 25.68 percent return on taxable bonds.

[2]/In 1969 the ratio reached 87.2 percent because the Congress was actively attempting to eliminate the tax-exemption for municipal bonds. When that effort failed, the market returned to its normal trends. However, for 11 of the past 20 years, the ratio was below the 70 percent mark and between 1977 and 1980 was under 65.5 percent due to a heavy demand for tax-exempts by institutional buyers.

Figure 2

The Tax-Exempt/Taxable Yield Ratio For AA Rated Bonds



Source: Moody's see appendix III for data trends

Some analysts contend that recent changes in the tax-exempt/taxable ratio are more a result of fundamental changes in the municipal market created by revisions in the tax code and new uses for (and, hence, supply of) municipal bonds. They reason that these changes will permanently increase the ratio between tax-exempt and taxable bonds. Other analysts disagree. They counter that the tax-exempt/taxable ratio reflected over the past 4 years is primarily a result of economic conditions and not a result of basic changes in the market.

It is too soon to tell whether there has been a permanent increase in the ratio of tax-exempt to taxable bond yields because of continuing changes in economic conditions and in the market's structure. However, based on our review of the trends over the past decade, we believe there have been significant changes in the supply of bonds by issuers and the demand for bonds by investors that, if continued, will contribute to higher tax-exempt interest rates relative to taxable bond rates.

CHANGES IN THE SUPPLY OF BONDS BY ISSUERS

The annual volume of new municipal bond issues has risen sharply over the past 5 years. This has occurred at the same

time that interest rates have been rising. The most important factor contributing to the increase in the supply of municipal bonds has been the rapid growth in the use of tax-exempt bonds for non-traditional purposes and the emergence of new types of borrowing jurisdictions. These factors have been accompanied by

- a shift from general obligation bonds to revenue bonds.
- a shift from competitive bids to negotiated sales.
- congressional moves to restrict the use of the tax-exempt privilege for non-traditional uses. Some of these restrictions are due to take effect in the near future.

Combined, these structural changes in the market have contributed to higher interest costs for bond issuers, [3]/ however, we have not attempted to estimate the precise extent of the increase.

While the historic response to rapidly rising interest rates in the municipal market is an overall sharp drop in new long-term bond sales as States and localities wait for interest rates to decline, this has not been the case in recent years. In 1982, the volume of long-term bond offerings reached a record high of $77.3 billion (which, adjusted for inflation and refundings, was $35.2 billion). [4]/ Figure 3 shows the decade-long increase in the volume of long-term tax-exempt bonds, after adjusting for inflation and refundings of old debt. Much of the growth is due to the significant increase in the use of tax-exempt bonds for non-traditional uses since 1970.

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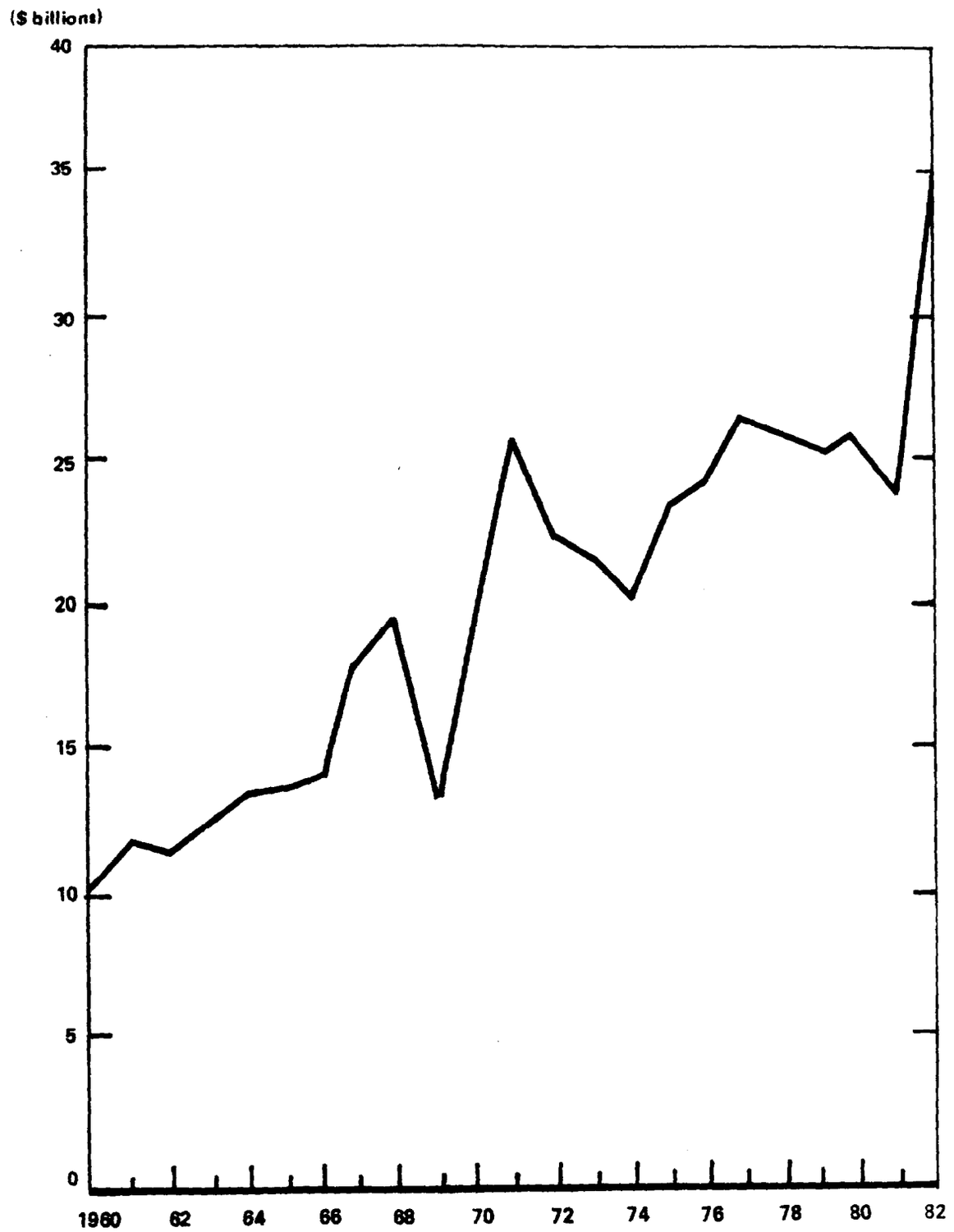
[3]/We do not discuss factors that affect interest rates paid by individual municipal borrowers. A comprehensive overview of the literature on this subject has been recently done by Timothy Cook in "Determinants of Individual Tax-Exempt Bond Yields: A Survey of the Evidence," Economics Review, Federal Reserve Bank, Richmond Va., May/June 1982; Volume 68, No. 3, pp. 14-39.

[4]/Short-term volume also reached a record high of $44.7 billion in 1982. The combined volume of long- and short-term bonds in 1982, therefore, was $122 billion, of which 37 percent was in short-term debt. While the volume of short-term debt more than doubled in the past 3 years, the net outstanding increase in short-term debt at the end of the year was only $8 billion--small in comparison to the long-term market. Also, as a share of the total tax-exempt market, short-term volume is less than it was in the early 1970s. Much of the recent increase in short-term debt volume is related to the uncertainty created by current economic conditions. Appendix V examines some of the trends in the short-term market.

Figure 3

Long-Term Tax-Exempt Volume



Source: Appendix IV Note: Real dollar adjustments are in 1972 dollars based on the GNP deflator.

According to the Municipal Finance Study Group at the State University of New York at Albany, an increase of $1 billion in tax-exempt bonds results in interest rates that are 3 to 5 basis points higher for the overall market than would otherwise be the case. [5]/ With the volume of long-term non-traditional bonds reaching $44 billion in 1982, the above estimate would imply that State and local interest rates could have been 132 to 220 basis points higher that year than they might have been otherwise. [6]/

Use of municipal bonds for non-traditional purposes has grown

The largest share of new tax-exempt bonds issued today are for non-traditional purposes. In 1982, only 47 percent of new bond sales were used to finance the more traditional types of projects funded in 1970.

We define non-traditional uses of the tax-exempt market to encompass uses for housing (most of which has been for single family mortgage subsidies since 1976), private economic development, hospitals (most of which subsidize private hospital construction), pollution control for private industry, and student loans. Some analysts also include public power because many public power bond issues finance privately owned public utilities. We did not include public power bonds as a non-traditional use because in some regions of the country public jurisdictions own these utilities. We therefore treat them as a traditional use of municipal bonds in our analysis.

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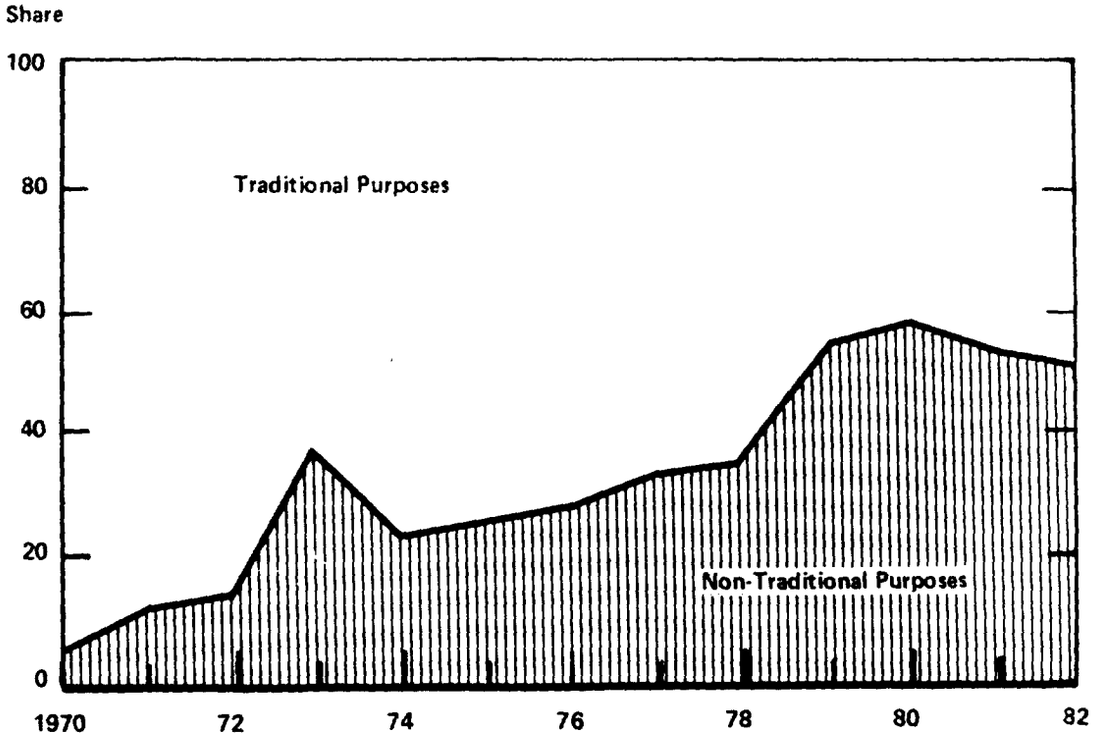
[5]/Ronald Forbes, et. al., "An Analysis of Tax-Exempt Mortgage Revenue Bonds," Municipal Finance Study Group, State University of New York, Albany, unpublished (May 1979), App. III.

[6]/Greater interest rates for issuers are not the only costs of increased volume. Analysts see the Federal Government as the biggest loser because the increase in the use of the tax-exempt interest subsidy comes at the expense of lost Federal revenues. The U.S. Treasury estimates the annual tax loss for new bonds issued in 1982 to be $3.7 billion for each year they remain outstanding. And, much like the Federal Government, States and localities also suffer a loss of foregone income tax revenues, since many also exempt local issues from State and local income taxes.

Figure 4 shows that over half of the present new issues market supports non-traditional uses, most of which were not financed through the tax-exempt market in 1970. Therefore, traditional uses of bonds must compete with non-traditional uses in the tax-exempt market for financial resources. 7/

Figure 4

Percentage Changes in the Use of Bond Proceeds for Traditional and Non-Traditional Purposes



Source: Computed based on figures in appendix VI

Note: "Non-traditional" uses of bonds is defined to include only housing, industrial development, pollution control, hospitals and student loans.

In 1970, the largest borrowers were the traditional types of local government--municipalities, counties, townships, and school districts. They comprised 46 percent of the market. State governments comprised 23 percent. (See table 2.) By 1982, the dominant borrowers were the less traditional forms of local government--statutory authorities and special districts. They were responsible for 57 percent of all borrowing. This growth pattern parallels the increase in the number of statutory authorities and special districts during the 1970s, which grew from 23,885 in 1972 to 28,433 in 1982.

7/Appendix VI identifies the specific uses of bond proceeds since 1970 and details the background of each of the five categories of non-traditional uses.

Table 2

Changes in the Type of Borrowers
in the Municipal Market, 1970-82

Type of Issuer	Percent Share of Volume in 1970	1975	1980	1982
States	23%	24%	11%	11%
Municipalities, Townships, Countries, School Districts	46	35	33	32
Special Districts and Statutory Authorities	31	41	56	57
TOTAL	100%	100%	100%	100%

SOURCE: Federal Reserve Board

State and local governments create special districts and statutory authorities to handle specific responsibilities, such as water, sanitation, transportation, and transit. These districts and authorities generally have appointed decisionmakers and have the authority to sell revenue bonds, which will be financed from fees they charge for services provided. Among the fastest growing types of districts and authorities are those that issue bonds for non-traditional purposes, such as housing and economic development.

The market has shifted from
dominance by general obligation bonds
to dominance by revenue bonds

Revenue bonds account for a growing percentage of the increasing volume of long-term tax-exempt issues. [8]/ Revenue bonds, which are supported by revenues generated by the project or activity financed by the issue, now account for over two-thirds of the volume of new bond sales. This is a complete reversal from 1970. (See figure 5.) This shift is associated with the growth in non-traditional purpose bonds. Nearly all of these bonds were financed as revenue rather than as general obligation bonds.

Revenue bonds are used to finance these activities for several reasons. First, some jurisdictions are legally prohibited from using general obligation bonds. Second, there is a growing

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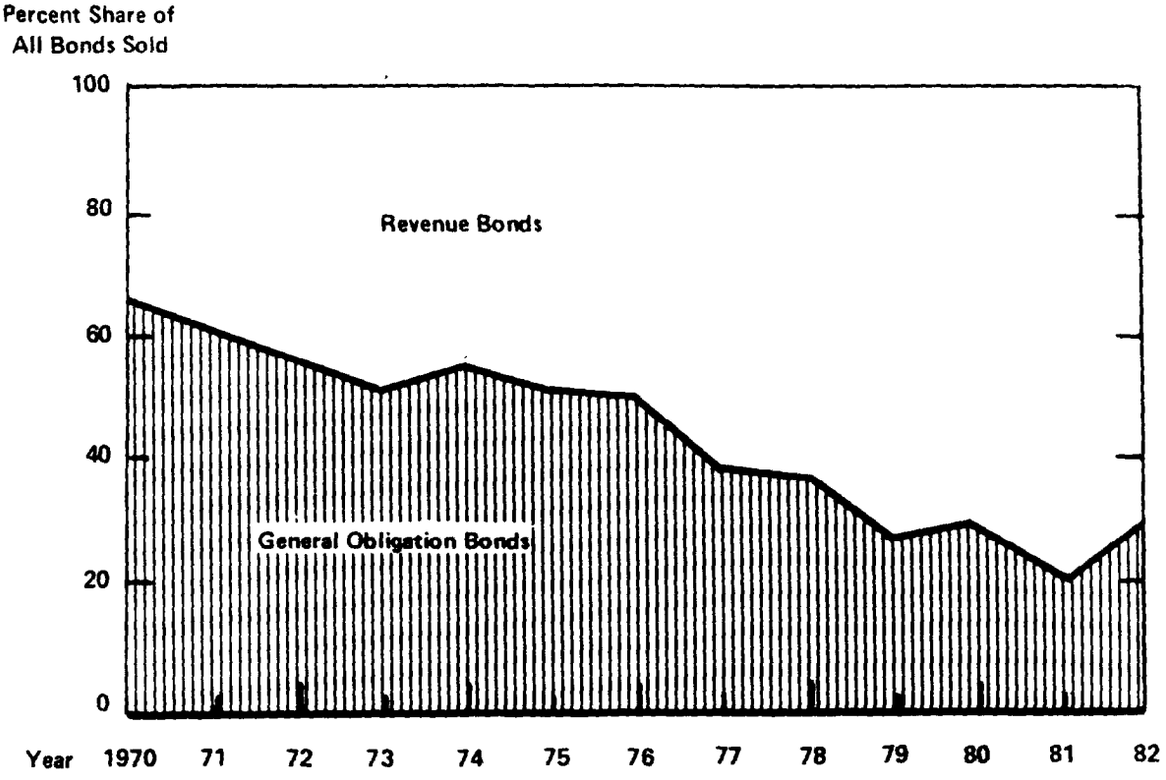
8/Ronald Forbes, Philip Fischer and John Petersen, "Recent Trends in Municipal Revenue Bond Financing," in Efficiency in the Municipal Bond Market, George Kaufman, ed. JAI Press, 1981.

reliance on user fees (which are used to repay revenue bonds) instead of general tax revenues to finance certain functions. This reliance has accelerated in recent years with the advent of State and local tax revolts, such as Proposition 13 in California. Between 1972 and 1980, user fees increased 135 percent compared with a 104 percent increase in taxes.

Figure 5

Percentage Change in the Use of General Obligation Bonds vs. Revenue Bonds



Source: Appendix VIII

Several other factors contributing to the rise in the use of revenue bonds include the following:

--In general, revenue bonds do not have to be approved by voters. Because of the uncertanties of voter approval, many localities prefer to finance projects or activities through special districts or statutory authorities.

--There has been a heavy reliance on revenue bonds by special districts and statutory authorities. These units of government have increased in number since 1970.

Revenue bonds are often perceived to be a greater investment risk than general obligation bonds because they are supported by

dedicated revenues and are not backed up by a jurisdiction's general taxing powers. For this reason, they command a higher interest rate in the market than equivalently rated general obligation bonds. [9]/ In 1982, interest rates for Aa-rated revenue bonds with a 20-year maturity were 55 basis points above equivalently rated general obligation bonds. Therefore, market sales of more revenue bonds have contributed to the overall rise in average interest costs in the municipal market.

More new tax-exempt issue sales are being negotiated than competitively bid

Bond issuers have three avenues for marketing their bonds in the primary market--competitive bids, negotiated sales, or private placement. Underwriters may bid competitively against each other to market new bonds from issuers. Competitive bids are required in all but one State (Pennsylvania) for general obligation bonds. [10]/ Alternatively, issuers may select a single underwriter to market its issue via a negotiated agreement. Revenue bonds are generally marketed through negotiated sales. A third approach is private placement, where issuers sell bonds directly to an investor, such as a local bank, with or without the aid of an underwriter. Most private placement sales go unreported and their volume is unknown.

Since 1970, the use of negotiated sales has increased tremendously. Only 17 percent of all bonds issued that year were negotiated sales. By 1982, 68 percent of all new issues were negotiated. Figure 6 shows this dramatic shift. The chief reason for this shift is the parallel increase in revenue bonds. For example, in 1982 only 12 percent of general obligation bonds were sold through negotiated sales; 76 percent of revenue bond sales were negotiated. Revenue bond sales are generally negotiated because they often entail more complicated financing arrangements than typical general obligation bonds. Thus, underwriters say they must be able to work more closely with the issuer to prepare and bring the issue to market.

Another factor contributing to the increase in the use of negotiated sales is the increase in the proportion of larger issues. Generally, larger issues are more complicated to structure and market. Therefore, they do not easily lend themselves to competitive bid procedures.

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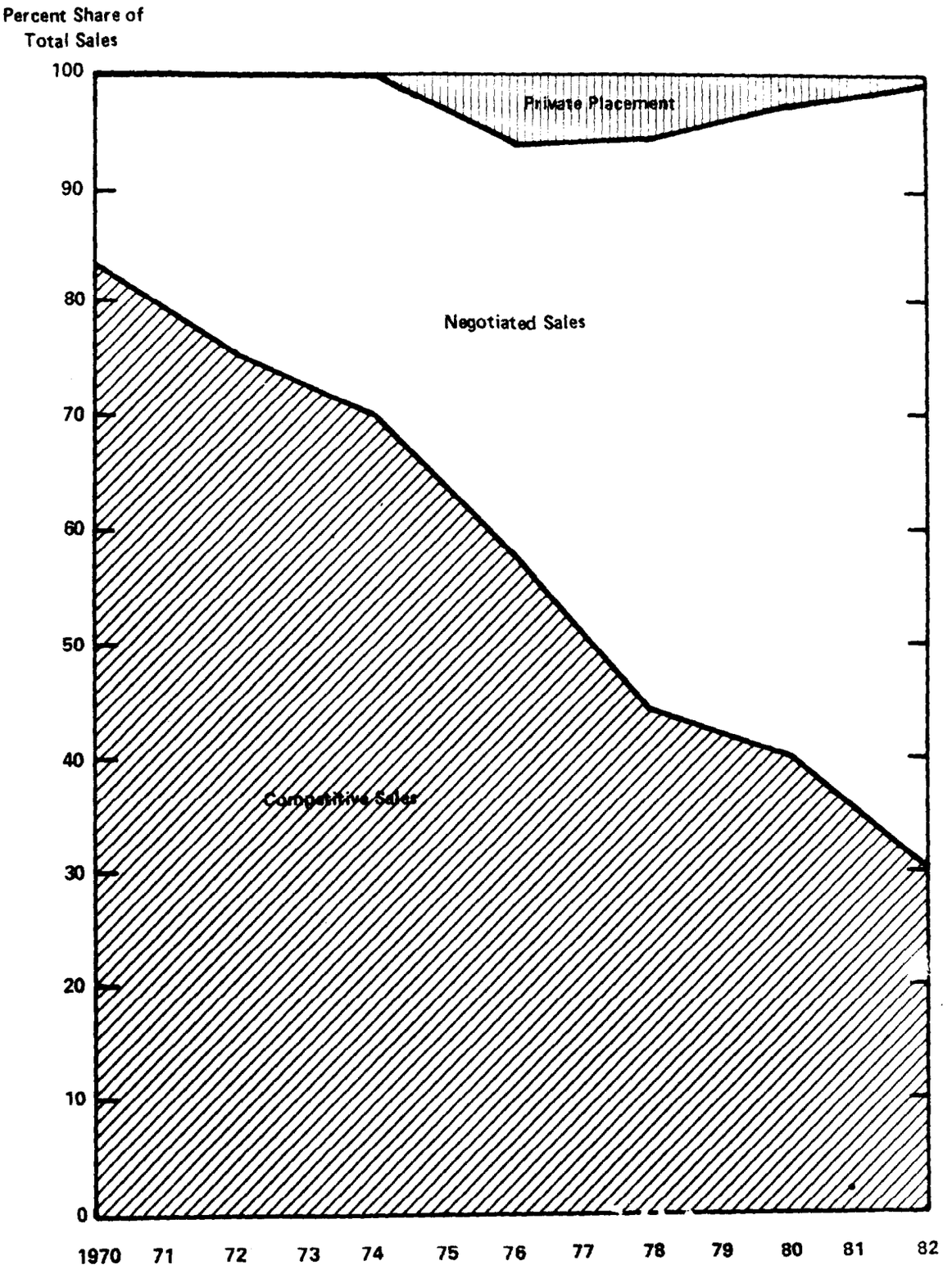
[9]/We were told that revenue bonds for infrastructure purposes carry lower interest yields than revenue bonds for non-traditional purposes; however, data were not readily available to confirm this observation.

[10]/In some States, general obligation bonds can be sold via negotiated bid if issuers fail to receive two or more bids for issues that have been competitively offered. In 1982, 369 of the 3,044 general obligation issues marketed were negotiated.

Figure 6

Percentage Change in the Use of Competitive vs. Negotiated Sales



SOURCE: APPENDIX IX

NOTE: Private placement figures represent only those placements publicly reported. Most privately placed funds are not publicly reported. For instance, total publicly reported private placement sales in 1982 totaled $0.6 billion, yet estimates for privately placed IDBs that year were about $10 Billion.

A third factor is that the individual (household) investor is becoming more important in the municipal market. As institutional buying declines, new issues must be sold to more buyers. Underwriters say that negotiated sales facilitate the marketing of bonds to large numbers of buyers because their brokers can "premarket" these bonds through their network of dealers. The uncertainty inherent in the competitive bid process makes premarketing difficult for investors as well as for underwriters.

One study of negotiated and competive bids for both general obligation and revenue bond issues estimates yields for negotiated sales to be 10 to 14 basis points higher than competitive bids. [11]/ However, several market analysts we spoke with say this estimate can be misleading. They contend that negotiated issues are often for less-known issuers and may be less marketable, thereby commanding a higher yield.

Congressional restrictions on the use of tax-exempt bonds helps explain record volume in 1982

A final factor affecting the recent volume of municipal offerings is the potential elimination of the tax-exempt status of single family mortgage revenue bonds after December 31, 1983. Because issuers do not know if this change will go into effect, a high volume of these bonds may flood the market during 1983. Housing bond sales in 1982 were $14.3 billion. Analysts say this volume (19 percent of the entire long-term market) was an effort by issuers to beat the sunset deadline. This higher volume, as mentioned earlier, probably contributed to higher interest costs in the overall municipal market for 1982.

Another pending sunset provision is the end of the tax-exempt status for small issue industrial development bonds after December 31, 1986. A similar rush to the market is anticipated.

CHANGES IN THE DEMAND FOR MUNICIPAL BONDS BY INVESTORS

The changes stemming from the non-traditional uses of tax-exempt bonds, such as the shift from general obligation to revenue bonds, the changes in underwriting arrangements, and changes in the tax-exempt status of some bonds, are not the only factors that have affected interest costs for State and local issuers. Changes in investors' perception of the bonds' attractiveness and changes in the tax code are also believed to have adversely

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[11]/Alfred Broadus and Timothy Cook, "An Analysis of the Determinants of the Yields on Individual Municipal Securities," Federal Reserve Bank of Richmond, unpublished paper presented at the 1981 meeting of the Western Finance Association.

affected the interest rate in recent years. A shift in who invests in the market contributes to the volatility of interest rates, and changes in the tax code may reduce the value of the tax-exemption to investors.

The tax exemption is most favorable to three types of investors: commercial banks, property and casualty insurance companies, and high income households. In 1982, these three sectors held 89 percent of all outstanding tax-exempt securities. Nonprofit institutions, State and local governments, public pension funds, etc., pay little or no income tax. Therefore, they generally find no advantage in investing in tax-exempt securities.

Bank demand for new bonds is declining

Banks have been the dominant investor in the market since the mid-1960s. However, since 1971, banks have held a declining share of outstanding municipal debt. The declining participation of the banking sector is offset by increased holdings of the insurance sector, households, and other investors (see table 3).

Table 3

Percent Composition Of Holdings Of Outstanding Municipal Bonds By Major Investor Groups, 1970-82

Year	Commercial Banks	Households	Non-Life Insurance Co.	Other
1970	48.6%	31.9%	11.8%	7.7%
1971	51.2	28.5	12.7	7.6
1972	51.1	27.4	14.1	7.5
1973	50.0	28.0	14.9	7.1
1974	48.7	29.8	14.8	6.7
1975	46.0	30.4	14.9	8.7
1976	44.3	29.3	16.2	10.2
1977	43.8	26.7	18.8	10.7
1978	43.3	25.0	21.6	10.1
1979	42.2	25.8	22.7	9.3
1980	41.8	26.5	22.7	9.0
1981	39.6	29.5	21.7	9.3
1982	34.2	35.9	19.3	10.6

SOURCE: Federal Reserve Flow of Funds Accounts, September 1982.

NOTE: The temporary increase in the "Other" category beginning in 1976 is due to the increase in purchases of bonds by State and local employee retirement systems in the wake of New York City's fiscal crisis. See appendix X for dollar volume figures of outstanding holdings by these investor groups.

Throughout the 1960s, commercial banks sharply increased their share of municipal bond holdings. This was spurred by a series of amendments to Regulation Q, beginning in 1961, that resulted in higher cost time deposits. To minimize the reduction in total after-tax earnings, banks shifted their investment portfolio toward relatively higher holdings of tax-exempt bonds. Also in the early 1960s, banks took advantage of an opportunity in the capital gains tax provision that permitted a reduction in their tax burdens. [12/] This, along with rapid growth in bank assets, encouraged banks to absorb a substantial share of the tax-exempt market.

Increases in the share of outstanding tax-exempt bonds held by banks during the 1960s turned into a decline in the 1970s. The Tax Reform Act of 1969 eliminated the capital gains tax opportunity. Also, the Monetary Control Act of 1980 stiffened competition within the financial sector by deregulating the protective interest rate ceilings (Regulation Q) on bank deposits. This, in turn, increased the cost of attracting deposits, which caused banks to seek assets and investment opportunities with higher yields than tax-exempts on a net tax basis. These actions included

- an increase in the use of leasing operations, which allows the use of investment tax credits. This form of investment is considered to be more profitable to banks. Growth in this area was stimulated in part by the expansion in bank holding companies.

- an increase in foreign investments by big banks to take advantage of the foreign tax credits available.

Other factors contributing to a reduced presence of banks in the municipal bond market included

- the general rise in interest rates, which left banks holding low yield bonds in a period where they had to offer high yields to their customers to keep their deposits. This left banks reluctant to invest large sums in long-term, fixed income instruments.

[12/] Before 1969, net capital gains (gross capital gains less gross capital losses) were taxed at the capital gains rate. Net capital losses, however, could be deducted from ordinary income before applying income tax rates. Therefore, banks would attempt to sell all those securities in their portfolio on which they had experienced a paper loss and to simultaneously replace them with similar securities. The Tax Reform Act of 1969 changed this situation. For further explanation of bank demand for bonds, see Ralph Kimball, "Commercial Bank Demands and Municipal Bond Yields," Federal Reserve Bank of Boston, Research Paper No. 63, 1977, p. 110-111.

- the loosened requirements by States that banks pledge municipal bonds as collateral for public deposits. As a result, banks purchased fewer municipal bonds.

- the use of more sophisticated investment techniques, which encourage shorter term investments and reduce bank demand for other types of municipal securities.

These factors, coupled with the recent tax law changes, lead market analysts to expect a continued declined in participation by banks in the municipal bond market for at least the next several years.

Household purchases offset declining bank demand

The decrease in the bank holdings of outstanding municipal bonds is being offset by a large increase in annual bond purchases by the household sector. In 1972, net household purchases were 16 percent of all new bond sales that year. By 1982, household purchases accounted for 87 percent of all new bond sales. (See appendix XI.) Much of the increase has been attributed to the higher interest returns and the growth of mutual bond funds, which can be classified under the household sector of tax-exempt investors.

Changes in Federal tax policies may affect investor buying patterns

Another factor affecting the demand for municipal bonds by all investors is the value of their tax-exempt status. Recent tax law changes have reduced marginal tax rates and created alternative tax shelters. Analysts told us that these changes combine to reduce the value of the tax-exemption for both institutional and individual investors. 13/

Statutory changes in 1981

The Congress reduced the maximum marginal individual income tax rate from 70 to 50 percent in the Economic Recovery Tax Act of 1981 (P.L. 97-34). It also will have reduced other income tax rates by 23 percent by 1984. This reduces the tax bracket rate for many taxpayers, and this, in turn, potentially reduces the demand for tax-exempt bonds, except for the possible offsetting effect of bracket creep. The lowering of the maximum marginal tax rate was accompanied by a reduction in the maximum capital gains tax rate from 28 to 20 percent. In the long run, this increases the attractiveness of stock equities over fixed-income securities.

13/See, for instance, John Petersen, "Has the Municipal Bond Market Undergone Fundamental Change?," paper presented to the Annual Conference of the American Public Power Association, May 1982.

Table 4 is an example of how changes in the tax rate could affect individual investors. If, for instance, municipal bond yields were 10 percent, then a joint return taxpaying unit earning $45,800 in 1982 would require a taxable equivalent yield of 16.39 percent. To gain the same taxable equivalent yield in 1984, after the full tax cut has gone into effect, the tax-exempt rate would have to rise to 11 percent--or 100 basis points--to be an investment of equivalent value. For those in higher tax brackets, the spread would be larger.

Table 4

Effects Of 1981 Changes In Tax Code
On Tax-Exempt vs. Taxable Interest Yields

Changes in Marginal Tax Rates by Income Level for 1982 / 1983 / 1984	Tax Bracket	Municipal Bond Yields			
		10.00%	10.25%	10.75	11.00%
		Taxable Equivalent Yields			
$35,200 - 45,800	39%	16.39	16.80	17.62	18.03
	35	15.38	15.76	16.53	16.92
	33	14.92	15.29	16.04	16.41
$45,800 - 60,000	44%	17.85	18.30	19.19	19.64
	40	16.66	17.08	17.91	18.33
	38	16.12	16.53	17.33	17.74
$60,000 - 85,600	49%	19.60	20.09	21.07	21.56
	44	17.85	18.30	19.19	19.64
	42	17.24	17.67	18.53	18.96

SOURCE: Lebenthal and Co.

The Act also created a number of competing tax shelters for both individuals and corporations. For individuals, the Act

- increased the limit on deductions for contributions to individual retirement accounts (IRAs) and expanded eligibility for creating one.
- doubled (from $7,500 to $15,000) the maximum deduction allowed for contributions to a Keogh self-retirement plan.

The Act also indexes marginal tax brackets, effective in 1985. This will reduce "bracket creep," which is created by inflation and lowers future tax liabilities of household investors.

For corporations, the 1981 Act

- expanded leasing of tax shelters, which permit firms not needing them because of low profitability to sell them to profitable corporations.

- increased the investment tax credit and accelerated depreciation schedules. Taken together, they enhance the rate of return for alternative investments and reduce the need for the tax-exemption of municipal bonds.

Statutory changes in 1982

The Tax Equity and Fiscal Responsibility Act of 1982 further reduced the potential commercial bank demand for tax-exempt securities by changing the tax treatment of bank municipal bond holdings. Under prior law, commercial banks could deduct from their Federal income taxes the carrying costs of their municipal securities. For all securities purchased after December 31, 1982, banks can only deduct 85 percent of the interest expense. This change, according to some analysts, will reduce the attractiveness of tax-exempt securities to commercial banks.

A second change requires all bonds issued after June 30, 1983, to be in registered rather than bearer form. Formerly, most bond certificates were bearer bonds, which did not identify the owner. Registered bonds are recorded by the issuer or its agents in the name of the owner and can be transferred to a new owner only when properly endorsed. Some market analysts believe the outstanding bearer bonds, which do not need to be registered, will create a two-tiered market because they believe investors prefer the anonymity and ease of transfer of bearer bonds over registered bonds. As a result, the newly issued registered bonds, they believe, will sell at a higher yield relative to bearer bonds in the secondary market.

Other analysts believe this change will, in the long run, be beneficial to the market since most institutional investors will prefer a registered security. Also, issuance costs could be considerably reduced as operations are computerized. They see the problem essentially as one of transition--getting the market to accept registered forms of security and installing the most economical form of registration possible. The actual effects of the switch have not yet been assessed because the change has been recent; however, no major problems have been noted by analysts.

SUMMARY OF EFFECTS:
HIGHER RELATIVE INTEREST COSTS

A number of changes have occurred in the municipal bond market in the past decade, including the shift from general obligation to revenue bonds, the shift from competitive to negotiated

sales, and congressional curtailment of certain uses of the tax-exemption. Many of these changes are related to the increased use of municipal bonds for non-traditional purposes. However, many analysts believe two trends stand out and that these trends will contribute to permanently higher costs, relative to other borrowers in the credit market. The foremost change has been the increase in the volume of new bond issues. This alone would be expected to increase interest rates given no major changes in demand. However, demand has also changed. Recent revisions of the tax code and the changing financial picture for commercial banks have reduced the value of the municipal bond tax exemption for investors. Combined, these changes have resulted in relatively higher interest rates for municipal borrowers.

Higher overall interest rates in the municipal market adversely affect the costs that States and localities must pay to borrow. This, in turn, affects the level of spending for traditional public infrastructure. The next chapter examines some of these effects.

CHAPTER 3

REDUCED INVESTMENT IN TRADITIONAL FORMS OF PUBLIC INFRASTRUCTURE

Although the volume of municipal bond sales has increased, the share of the increased borrowing used for the traditional forms of infrastructure has declined over the past decade. Higher interest rates have contributed to this decline in two ways. We found that (1) State and local governments postpone or delay bond issues during high interest rate periods, and (2) high interest rates reduce the amount of funds available for infrastructure construction because a greater share of debt service is required to finance interest payments.

PREVIOUS STUDIES OF THE EFFECTS OF INTEREST RATES ON BOND SALES

In a 1971 study by the Federal Reserve Board [1/] and a 1982 survey by the Joint Economic Committee (JEC), [2/] rising interest rates were identified as the major source of delayed or cancelled long-term borrowing. The second reason was legal interest rate ceilings set by States.

The 1971 Federal Reserve study gathered data from a sample of 4,200 localities for fiscal year 1970 via a special survey conducted by the U.S. Bureau of the Census. It gathered information on planned State and local borrowing for that year and then measured the actual borrowing that occurred. It found that, due to credit conditions and statutory interest rate ceilings in 1970, there was $7.4 billion in delays or cancellations in long-term borrowing planned for that year. Actual borrowing was $13.3 billion. Of the $7.4 billion in setbacks, $2.2 billion was completed before the end of the fiscal year. Much of the remainder was financed through the short-term market, with only $1.6 billion suspended beyond the period under study.

The 1982 JEC study examined borrowing by 301 cities in 1981. It found 73 cases of postponed or cancelled borrowing, totalling $685 million. Eighty-three percent of these delays and cancellations were attributed to high interest rates or legal interest rate ceilings.

[1/] John E. Petersen, "Responses of State and Local Governments to Varying Credit Conditions," Federal Reserve Bulletin, March 1971, pp. 209-232.

[2/] Joint Economic Committee, Trends in Fiscal Conditions of Cities: 1980-82, 97th Congress, 2nd Session, September, 1982.

GAO ANALYSIS OF THE RELATIONSHIP BETWEEN INTEREST RATES AND CANCELLATIONS OR DELAYS CONFIRMS PREVIOUS STUDIES

To further assess the relationship between changes in the interest rates and municipal bond cancellations or delays, we analyzed unpublished data collected by the Federal Reserve since 1974 on publicly announced sales that were postponed or cancelled.

Table 5 shows the annual volume of reported delays and cancellations between 1974 and 1982 and compares it with the total volume of bonds actually marketed in those years. The rise and fall in delays and cancellations roughly parallel the rise and fall of interest rates.

Table 5

Annual Volume Of Delayed And Cancelled Bond Sales Compared With Total Annual Long-Term Bond Volume, 1974-82
($ billion)

Year	Volume of Delayed/ Cancelled Bond Sales	Volume of Completed Bond Sales	Ratio of Delayed/ Cancelled to Actual Sales
1974 a/	$3.21	$23.59	13.6%
1975	1.96	30.66	6.4
1976	1.02	35.42	2.9
1977	1.47	46.71	3.1
1978	1.52	48.19	3.2
1979	3.40	43.31	7.9
1980	7.99	48.37	16.5
1981	7.20	47.73	15.1
1982	3.97	77.29	5.1

a/1974 data are for March through December only.

SOURCE: Federal Reserve Board and Public Securities Association.

Table 6 shows that both interest rate levels and changes were positively correlated with the volume of delays and cancellations (i.e., they moved in the same direction). The correlations, however, do not answer the question of how sensitive postponements and cancellations were to levels and changes in the interest rate. Nor do the results show the relative importance of the interest rate to other factors in determining postponements and cancellations.

Table 6

Correlations Between Bond Postponements and Cancellations, Interest Rate Levels, and Interest Rate Changes, 1974-82

	Postponements and Cancellations	Level of Interest Rate	Change in Interest Rate
Postponements and Cancellations	--	0.448	0.484
Interest Rate	0.448	--	0.099
Change in Interest Rate	0.484	0.099	--

SOURCE: General Accounting Office

NOTE: The closer a correlation measure is to 1.0, the stronger relationship between two factors. The correlation is based on monthly data over the 1974-82 period.

To answer these questions, we conducted a second statistical test to analyze these relationships. Our results show, first, that a significant share of the increase in delays and cancellations over the past 8 years is due to the rate of change in the interest rate (see appendix XII, table 19). The effects of factors such as the interest rate level and statutory interest rate ceilings are also significant, but are only about half as important as the amount of fluctuation in the interest rate. This suggests that bond issuers may pay greater attention to interest rate fluctuations than to other factors, and are apt to delay an issue if interest rates change more than their initial expectations. Second, we found that a 1 percent increase in the interest rate level is related to a 0.83 percent increase in the volume of cancellations and delays of bond issues. Therefore, if, hypothetically (and holding other factors constant), interest rates increased from 10 percent to 11 percent (a 10 percent increase), and the volume of delays and cancellations was $5 billion when interest rates were 10 percent, then delays and cancellations would increase by $417 million. 3/

3/One reviewer of our draft manuscript believes we overstate the effects of interest rates in our analysis of postponements and cancellations. He believes there were notable postponements for reasons only tangentially related to interest rates. We isolated technical, non-interest rate reasons for postponements and cancellations in our analysis and found there was, in fact, a small but statistically significant effect on postponements and cancellations attributable to non-interest rate factors. See appendix XII, table 19.

While high interest rate levels directly affected the rate of postponements and cancellations, a remaining question exists as to how high interest rates, in turn, affected the financing of infrastructure projects. Though our data were not sufficiently detailed to determine the intended uses of funds (traditional vs. non-traditional) from issues that were postponed or cancelled, we could identify whether the postponements were general obligation or revenue bonds. We found that general obligation bonds (which finance traditional infrastructure) were postponed or cancelled about as often as were revenue bonds (which finance non-traditional uses). (See appendix XII.) In light of this, we have no basis for thinking that cancellations or postponements for infrastructure projects differed as a proportion of total financings from those for non-traditional financings. Since 47 percent of new issues marketed in 1982 were for traditional purposes, it is reasonable to surmise that the same percentage of total cancellation and postponements involved financings for traditional uses. Using this figure, postponed or cancelled infrastructure projects would be about $1.9 billion in 1982, which is equivalent to 5 percent of those issues successfully marketed for traditional purposes.

Some data limitations

The Federal Reserve data used in our analysis have several limitations that may affect its interpretation. The data cover only those bond issues that were on the verge of being marketed. Many jurisdictions delay or cancel an issue long before they prepare it for issuance. So, in this regard, the data may underestimate the real rate of delays and cancellations. However, some of the delayed issues are remarketed shortly afterwards or an issue is postponed more than once, therefore cancellations cannot be distinguished from temporary postponements. The 1971 Federal Reserve study found that one-third of the delays or cancellations in its survey were remarketed within a year. Also, the 1971 study shows a shift to short-term borrowing. The data we examined were not detailed enough to show these type of distinctions. We do not know the extent of duplication caused by remarketing, which may overstate annual volume figures, nor do the data distinguish whether the postponement or cancellation was for a long-term or short-term offering. As a result, our data may in fact overstate, rather the understate, the potential effects of delays and cancellations on State and local governments' abilities to finance their infrastructure through the bond market. Our review of the data, though, leads us to believe they give a good estimate of the relative direction of change even though the actual magnitude of change may not be completely accurate.

HOW INCREASED INTEREST RATES AFFECT STATE AND LOCAL BORROWING COSTS

Municipal bond issuers paid substantially more for new borrowings in 1981 than they did several years before. In 1978, for example, they issued $46 billion in long-term bonds at an

estimated average interest rate of 5.5 percent. In 1981 they issued the same amount of bonds at 10.6 percent--nearly double the 1978 rate. Thus, States and localities paid approximately $2.3 billion more in annual interest costs for an equivalent amount of debt issued just 4 years earlier. Over an 18 year period (the estimated average life of a bond), this will cumulate to additional interest costs of $41 billion.

Table 7 shows the increased costs individual issuers face as a result of increased interest rates. For a hypothetical borrowing of $100 million in 1978 (when the average Aa-rated jurisdictions borrowing costs were 5.5 percent), we find total interest costs after 20 years ranging from $58 million to $67 million, depending on the repayment method chosen. To borrow the same amount in early 1982, when interest rates were 12.5 percent, we see interest costs increasing from $131 to $176 million--significantly greater than the amount being borrowed. As a result, States and localities are paying a larger proportion of their annual debt service for interest costs instead of principal. (See table 8.)

Table 7

Differences in Debt Service Costs At Various Interest Rates for Bonds with 20-Year Maturities

	Using Level Debt Service at		Using Level Principal Payments at	
	5.5%	12.5%	5.5%	12.5%
Principal	$100,000,000	$100,000,000	$100,000,000	$100,000,000
Interest	67,358,660	176,191,466	57,750,000	131,250,000
Debt Service	167,358,660	276,191,466	157,750,000	231,250,000

SUMMARY OF EFFECTS: CANCELLATIONS, POSTPONEMENTS, REDUCED INFRASTRUCTURE SPENDING

Higher interest rates contribute to an increase in postponed or cancelled sales of bonds and an increase in the share of debt service dedicated to interest payment instead of principal. This in turn has contributed to reduced State and local expenditures for traditional forms of public infrastructure. In 1980, an estimated $52.1 billion was spent by State and local governments for traditional forms of infrastructure. (See table 9.) This dropped to an estimated $48.5 billion in 1982, a 7 percent decline. However, in constant dollars, capital investment in infrastructure began declining in 1968 and has been downward through the end of the period analyzed in this study. A number of factors, such as voter disapproval of new bond issues, contributed to this decline. Nevertheless, high interest rates in recent years, stemming from structural changes in the market and general economic conditions, have played a significant role.

Table 8

Percent Share of State And Local Debt Service Dedicated To Interest Payments
($ in billions)

Year	Total Debt Service	Interest Paid on Debt	Interest Paid as a Share of Total Debt Service
1970	$24.3	$ 5.1	21.1%
1971	28.8	5.9	20.5
1972	30.8	6.9	22.4
1973	32.7	7.8	23.9
1974	35.5	8.8	24.9
1975	40.8	10.1	24.7
1976	41.8	11.7	27.9
1977	39.6	13.1	32.8
1978	42.2	14.0	33.2
1979	54.3	15.5	28.5
1980	48.2	17.6	36.6
1981	51.6	17.1	33.1

SOURCE: U.S. Census Bureau, Government Finance, Series No. 5, various years.

NOTE: Debt service is the sum of long-term debt retired, short-term debt outstanding at year end, and interest paid on debt. Debt service is based on capital borrowings, which are a subset of the total municipal securities market. Therefore, actual costs for the entire market are higher than these figures reflect.

Table 9

Capital Investment in Structures and Equipment by State and Local Governments, 1960-82
($ in billions)

Year	Current Dollars	Constant (1972) Dollars
1960	$13.1	$21.2
1961	14.1	22.7
1962	14.7	23.1
1963	16.6	25.7
1964	17.9	27.4
1965	19.5	29.0
1966	21.8	31.3
1967	24.5	33.9
1968	26.9	35.9
1969	27.4	34.0
1970	27.8	31.8
1971	29.2	30.9
1972	30.2	30.5
1973	32.8	30.8
1974	39.9	31.8
1975	41.3	30.0
1976	39.4	27.8
1977	38.3	25.6
1978	44.7	26.7
1979	47.3	24.8
1980	52.1	24.6
1981	50.2	22.4
1982	48.5	21.1

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, unpublished data

GLOSSARY

Basis Point - Yields on bonds are usually quoted in increments of basis points. One basis point is equal to 1/100 of 1 percent.

Bearer Bond - A bond on which no specific owner is identified. The presumed owner is the person who holds it.

Bond - A written promise to pay a specified sum of money, called the face value or principal amount, at a specified date or dates in the future, called maturity date(s), together with periodic interest at a specified rate. The difference between a note and a bond is that the latter runs for a longer period of time and requires greater legal formality.

Bond Anticipation Note - Notes that are issued by States and municipalities to obtain interim financing for projects that will eventually be funded long term through the sale of a bond issue.

Bond Bank - Institutions established in a few States to buy entire issues of bonds of municipalities, financed by the issuance of bonds by the bond bank.

Competitive Bidding - A sale of municipal securities by an issuer in which underwriters or syndicates of underwriters submit sealed bids to purchase the securities.

Debt Service - The payments required for interest on and repayment of principal amount of debt.

General Obligation Bond - Bonds that are backed by the full faith and credit of the issuing government with a guarantee of repayment, based on its taxing powers. Voter approval is often required before these bonds can be issued.

Industrial Development Bond - Bonds that are issued by a State, municipality, or special authority to finance a facility for a private corporation. Repayment of the bonds rests not with the issuing body but with the private corporation, which benefits from lower interest costs since funds are borrowed at tax exempt rates. There are two types of industrial development bonds, unrestricted and small issue. Unrestricted bonds are used to finance projects such as housing, sports stadiums, airports, convention centers, and pollution control. Small issue bonds, limited to $10 million or less, are primarily used for economic development. Industrial development bonds are also known as industrial revenue bonds.

Infrastructure - In this report, public infrastructure refers to structures and equipment owned by States and localities. This includes highways, bridges, buildings, mass transit systems, and public utilities such as water, sewer, or power systems.

Interest - Compensation paid or to be paid for the use of money. Interest is generally expressed as an annual percentage rate.

Issuer - A State, political subdivision, agency, or authority that borrows money through the sale of bonds or notes.

Maturity - The date when the principal amount of a security becomes due and payable.

Municipal Bond - A tax-exempt security issued by a State or local governmental unit.

Negotiated Sale - In a negotiated sale, the issuer of municipal securities chooses one underwriter or a group of underwriters to sell its bonds to investors. There is no competitive bid for the issue.

Primary Market (new issue market) - Market for new issues of municipal bonds and notes.

Refunding - A system by which a bond issue is redeemed by a new bond issue under conditions generally more favorable to the issuer.

Registered Bond - A bond listed in the name of the holder. When sold it must be transferred on the books of the issuer and its agent. When fully registered, no coupons are attached and the interest is paid to the owner by check by the paying agent.

Revenue Anticipation Notes - Notes that are issued in anticipation of other sources of future revenue, typically Federal or State aid.

Revenue Bond - A limited obligation bond that has no claim on the issuer's tax revenues. Instead, repayment is based on the revenues generated by the specific projects, financed by the bond issued. Revenue bonds, usually, do not require voter approval.

Secondary Market - Market for issues previously offered or sold.

Short Term Debt - Debt with a maturity of one year or less after the date of issuance.

Special District - A local district established to provide residents of that district with a specific service. Examples would include school, water, sewer, fire, or road districts. The district may be funded through user fees or a tax on district residents.

Spread Banking - The endeavor of a bank to match its interest rate-sensitive assets with its interest rate sensitive liabilities. Thus, a bank avoids making long-term loans or investment with short-term deposits.

Statutory Authority - A governmental agency or corporation established to administer a revenue-producing enterprise, such as a transit system, public housing, airport, sports stadium, or convention center. Often, its operations cuts across political boundaries.

Tax Anticipation Notes - Notes issued by States and localities to finance current operations in anticipation of future tax receipts.

Tax Exempt/Taxable Yield Ratio - Comparison of interest rates on newly issued tax exempt bonds to those on similarly rated taxable corporate bonds issued during the same period.

Underwriter - The investment house or houses that purchase a bond offering from the issuing government. A joint venture account of a number of underwriters is called the underwriting syndicate (or syndicate for short). The gross profit the syndicate makes between the established retail price and its wholesale buying price is known as the spread. Out of this spread, the underwriter or syndicate pays all costs of distribution.

Yield - The net annual percentage of income from an investment. The yield of a bond reflects interest rate, length of time in maturity, and write-off to premium or discounts.

METHODOLOGY USED TO COMPUTE THE COMPOSITION OF INFRASTRUCTURE FINANCING SOURCES

Three sources of finance are relied upon for the outlays made for State and local fixed capital projects: Federal grants, long-term borrowing and current revenues. The proportion each of these sources comprise of the total capital investment is impossible to accurately determine because the actual degree of fungibility among sources of finance cannot be measured. However, some estimate of relative magnitude is possible to compute based on the following approach:

TCI = F + B + C, where:

TCI = Total Capital Investment

Total capital investment data are annual estimates of total new investment in gross fixed State and local capital formation. Data are based on reports to the U.S. Census Bureau, Government Finances, No. 5 series. These data are based on local fiscal years. These data are not comparable to Bureau of Economic Analysis investment data used elsewhere in this report (BEA data are calendar year and use a more restrictive definition of infrastructure investment).

F = Federal Capital Grants

Federal capital grants, as reported by the Office of Management and Budget in Special Analysis D of the Budget, are combined with Office of Revenue Sharing reports on the use of general revenue sharing aid for capital construction. OMB historical data series are based on November 1982 revisions (see appendix VII). Data are for fiscal years, which change from July to October in 1976. Our series exclude the transition quarter.

B = Long-Term Borrowing

Long-term borrowing through the municipal bond market for State and local capital formation, net of refundings and non-traditional public purposes. Data are calendar year, and are primarily based on data from the Public Securities Association (see table 18).

C = Current Revenues

Current State and local revenues include short-term borrowing, liquid asset holdings, privately placed bonds, tax and non-tax revenues. Data are residuals computed in table 12.

The methodology is based on techniques developed by Schneiderman and CONSAD. [1]/ However,these results do not match theirs because of differences in data bases. This lack of compatibility is not uncommon with these types of estimates.

The remainder of this appendix details the data used to develop figure 3. Table 10 displays the Federal aid figures used; table 11 details the development of the long-term borrowing figures used; table 12 computes the residual that comprises current revenue sources; and table 13 summarizes the resulting percentage shares each of these sources receives from total State and local capital investment.

Table 10

Federal Aid as a Share of Total Capital Investment, 1970-82
($ in billions)

Year	Total Capital Investment	Federal Grants a/	Revenue Sharing	Total Federal	Federal as % of TCI
1970	$29.6	$ 7.0	$0.0	$ 7.0	23.6%
1971	33.1	7.9	0.0	7.9	23.9
1972	34.2	8.4	0.0	8.4	24.6
1973	35.3	8.8	0.9	9.8	27.8
1974	38.1	9.8	2.5	12.3	32.3
1975	44.8	10.8	2.6	13.4	29.9
1976	46.5	13.5	2.2	15.7	33.8
1977	44.9	16.1	1.7	17.7	39.4
1978	44.8	18.3	1.5	19.8	44.2
1979	53.2	20.0	1.5	21.5	40.4
1980	62.9	22.4	1.5	23.9	38.0
1981	67.6	22.1	1.5	23.6	34.9
1982	n/a	20.5	1.5	22.0	--

a/The Federal grants data include some non-infrastructure expenditures. For instance, by some estimates up to half of Community Development Block Grant dollars are used for purposes other than traditional capital investment.

SOURCES: Office of Management and Budget, Special Analyses of the Budget, Fiscal Year 1984, p. H-18, and unpublished data; Office of Revenue Sharing; and Bureau of the Census.

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[1]/Paul Schneiderman, "State and Local Government Gross Fixed Capital Information: 1958-73," Survey of Current Business, Bureau of Economic Analysis, October 1975, pp. 17-26, and CONSAD, Public Works Investment in the United States, for the U.S. Department of Commerce, 1980, p. I.83.

Table 11

Long-Term Borrowing as a Share of Total Capital Investment, 1970-82 ($ in billions)

Year	Total Capital Investment	Long-Term Bonds Sold (less refundings)	(Less) Non-Traditional Uses of Bonds	Total Long-Term Borrowing for TCI	Long-Term Borrowing as % of TCI
1970	$29.6	$18.0	$ 1.9	$16.1	54.4%
1971	33.1	24.4	3.9	20.5	61.9
1972	34.2	22.0	4.8	17.2	50.3
1973	35.3	22.2	9.9	12.3	34.8
1974	38.1	22.9	6.9	16.0	42.0
1975	44.8	30.3	9.6	20.7	46.2
1976	46.5	33.3	11.9	21.4	46.0
1977	44.9	38.0	15.3	22.7	50.6
1978	44.8	42.0	19.1	22.9	51.1
1979	53.2	47.5	29.1	18.4	34.6
1980	62.9	53.9	34.8	19.1	30.4
1981	67.6	55.7	35.8	19.9	29.4
1982	n/a	83.2	50.5	32.7	--

SOURCES: U.S. Census Bureau, Government Finance Series No. 5, various years, appendix IV and table 18.

NOTE: Non-traditional borrowing is defined to include housing, hospitals, industrial development, student loans, gas and electric utilities, and private pollution control. Gas and electric utilities are included here (and not elsewhere in this report) as a non-traditional purpose because it includes private sector uses of tax-exempt bonds which cannot be "backed out" of this data series. In order to make these data compatible with the Census' Total Capital Investment data series (which exclude financing for private utilities even if they are financed with public borrowing), we classified the entire utilities data series as non-traditional.

Table 12

Current Revenues as a Share
of Total Capital Investment, 1970-82
($ in billions)

Year	Total Capital Investment	(Less) Federal Aid	(Less) Long Term Borrowing For TCI	Current Revenues (Residual)	Cur.Rev. as % of TCI
1970	$29.6	$ 7.0	$16.1	$ 6.5	22.0%
1971	33.1	7.9	20.5	4.7	14.2
1972	34.2	8.4	17.2	8.6	25.1
1973	35.3	9.8	12.3	13.2	37.4
1974	38.1	12.3	16.0	9.8	25.7
1975	44.8	13.4	20.7	10.7	23.9
1976	46.5	15.7	21.4	9.4	20.2
1977	44.9	17.7	22.7	4.5	10.0
1978	44.8	19.8	22.9	2.1	4.7
1979	53.2	21.5	18.4	13.3	25.0
1980	62.9	23.9	19.1	19.9	31.6
1981	67.6	23.6	19.9	24.1	35.7
1982	n/a	22.0	32.7	--	--

SOURCES: See tables 10 and 11.

Table 13

Summary of Percentage Shares
Each Funding Source Receives From
Public Infrastructure Financing Sources, 1970-81

Year	Federal Aid	Long Term Borrowing	Current Revenues	Total
1970	23.6%	54.4%	22.0%	100.0%
1971	23.9	61.9	14.2	100.0
1972	24.6	50.3	25.1	100.0
1973	27.8	34.8	37.4	100.0
1974	32.3	42.0	25.7	100.0
1975	29.9	46.2	23.9	100.0
1976	33.8	46.0	20.2	100.0
1977	39.4	50.6	10.0	100.0
1978	44.2	51.1	4.7	100.0
1979	40.4	34.6	25.0	100.0
1980	38.0	30.4	31.6	100.0
1981	34.9	29.4	35.7	100.0

a/ Due to rounding, sums may not equal 100 percent.

SOURCES: See tables 10, 11, and 12.

APPENDIX III

Average Annual Tax-Exempt/Taxable Yield Ratio, 1950-82 (Moody's Aa-Rated Issues)

Year	Average Annual Municipal Bond Yields	Average Annual Corporate Bond Yields	Tax Exempt/ Taxable Yield Ratio
1950	1.76%	2.69	65.4
1951	1.78	2.91	61.2
1952	2.00	3.04	65.8
1953	2.54	3.31	76.7
1954	2.16	3.06	70.6
1955	2.32	3.16	73.4
1956	2.72	3.45	78.8
1957	3.33	4.03	82.6
1958	3.17	3.94	80.5
1959	3.55	4.51	78.7
1960	3.51	4.56	77.0
1961	3.46	4.48	77.2
1962	3.17	4.47	70.9
1963	3.16	4.39	72.0
1964	3.19	4.49	71.0
1965	3.25	4.57	71.1
1966	3.76	5.23	71.9
1967	3.86	5.66	68.2
1968	4.31	6.38	67.6
1969	6.28	7.20	87.2
1970	6.28	8.32	75.5
1971	5.36	7.78	68.9
1972	5.19	7.48	69.4
1973	5.09	7.66	66.4
1974	6.04	8.84	68.3
1975	6.77	9.17	73.8
1976	6.12	8.75	69.9
1977	5.39	8.24	65.4
1978	5.68	8.92	63.7
1979	6.12	9.94	61.6
1980	8.06	12.50	64.5
1981	10.89	14.75	73.8
1982	11.31	14.41	78.5

SOURCE: Moody's Investor Service

Long-Term Tax Exempt Volume
($ in millions)

	Dollar Volume (Current Dollars)	Refundings a/	Net Dollars (Current Dollars)	Volume (Constant 1972 Dollars) b/
1950	$ 3,694	$ 122	$ 3,572	$ 6,669
1951	3,278	98	3,180	5,570
1952	4,401	330	4,071	7,029
1953	5,558	127	5,431	9,233
1954	6,969	158	6,811	11,437
1955	5,977	76	5,901	9,699
1956	5,446	76	5,370	8,552
1957	6,958	60	6,898	10,624
1958	7,449	143	7,306	11,063
1959	7,681	59	7,622	11,275
1960	7,230	53	7,177	10,447
1961	8,360	54	8,306	11,980
1962	8,558	260	8,298	11,752
1963	10,106	1,276	8,830	12,320
1964	10,544	656	9,888	13,588
1965	11,084	788	10,296	13,846
1966	11,079	220	10,859	14,147
1967	14,405	173	14,232	18,002
1968	16,320	138	16,182	19,605
1969	11,702	51	11,651	13,424
1970	18,083	55	18,028	19,714
1971	24,929	451	24,478	25,495
1972	23,692	1,569	22,123	22,123
1973	23,821	1,234	22,587	21,359
1974	23,585	582	23,003	19,989
1975	30,659	935	29,724	23,630
1976	35,416	3,515	31,901	24,105
1977	46,706	9,587	37,119	26,504
1978	48,190	9,284	38,906	25,865
1979	43,309	1,872	41,437	25,356
1980	48,368	1,650	46,718	26,152
1981	47,725	1,190	46,535	23,802
1982	77,294	4,254	73,040	35,246

a/These refundings are based on Bond Buyer data, therefore the data do not match the PSA figures used in table 18.

b/Based on implicit GNP deflators as reported in Economic Report of the President, 1983, table B-3, p. 166.

SOURCE: Public Securities Association, Bond Buyer.

APPENDIX IV

SHORT-TERM BOND VOLUME

The volume of short-term tax-exempt issues rose significantly in the past 2 years. In 1982, short-term volume comprised 37 percent of the total market. Table 14 shows short-term bonds as a share of total bond volume.

Table 14

Volume of Short-Term Debt
As A Share of Total Volume, 1970-82
($ in billions)

Year	Total Bond and Note Volume	Short-Term Note Volume	Short-Term As % of Total
1970	$ 35.6	$17.9	50.3
1971	50.7	26.3	51.9
1972	49.2	25.2	51.2
1973	47.6	24.7	51.9
1974	51.9	29.0	55.9
1975	58.3	29.0	49.7
1976	55.4	20.1	36.3
1977	71.5	24.8	34.7
1978	69.7	21.4	30.7
1979	65.0	21.7	33.4
1980	76.2	27.7	36.4
1981	85.2	37.4	43.9
1982	122.0	44.7	36.6

SOURCE: Public Securities Association

A major factor in this increase has been the increase in short-term housing notes. Increases have also occurred in the issuance of tax and revenue anticipation notes. Table 15 breaks out the increase in short-term volume by use of proceeds.

One of the reasons for the increase in housing notes is a change in policy by the U.S. Department on Housing and Urban Development, which guarantees many of these notes. HUD, because of the high interest rates, changed its support of 12 month notes to 6 month notes, thereby increasing the annual volume of notes issued without increasing actual net volume. Table 16 shows the net increase in year-end notes outstanding. As can be seen, the recent increases are not significant when taken in context with net volume outstanding in the early 1970s.

The short-term market has maintained a more favorable tax-exempt/taxable ratio than the long-term market, as may be seen in table 17. As a result, some localities have resorted to 1-year bond anticipation notes to finance projects in the hope that long-term rates will become more favorable.

Table 15

Percentage Share of Short-Term Tax Exempt Funding, by Type

Year	Urban Renewal	Bond Anticipation Notes	Tax and Revenue Anticipation Notes	Housing Notes
1979	3.0%	13.8%	29.3%	44.7%
1980	1.2	10.7	22.7	56.3
1981	0.4	12.0	20.7	56.7
1982	0.4	8.8	24.3	59.5

SOURCE: Public Securities Association

Table 16

Change in Net Volume of Short-Term Notes Issued, Year End, 1970-81 ($ in billions)

Year	Net Volume
1970	$12.2
1971	15.2
1972	15.7
1973	15.9
1974	16.7
1975	19.8
1976	18.8
1977	13.4
1978	11.4
1979	11.8
1980	13.1
1981	15.6

SOURCE: U.S. Census Bureau, Government Finance Series, No. 5, various years.

Table 17

Tax-Exempt/Taxable Bond Ratio
for Short-Term and Long-Term Bonds
1974-82

Year	Short-Term Tax Exempt/Taxable Yield Ratio	Long-Term Tax Exempt/Taxable Yield Ratio
1974	50.0%	68.3%
1975	53.0	73.8
1976	49.0	69.9
1977	47.6	65.4
1978	44.2	63.7
1979	44.4	61.6
1980	42.4	64.5
1981	47.4	73.8
1982	52.7	78.5

SOURCE: Public Securities Association

The short-term market has maintained this more favorable ratio because of the high demand for short-term tax exempt funds in the market. Much of this demand is stimulated by the explosive growth in the short-term tax exempt money market funds. In January 1981, total assets of these funds was just under $2 billion. By June 1982, assets jumped to $8 billion.

The effects of the growth in the short-term market on overall market interest rates are unclear. Analysts say its growth is indicative of uncertainty in the market over long-term economic conditions and is not a structural phenomena.

TRADITIONAL AND NON-TRADITIONAL USES OF BOND PROCEEDS, 1970-82 AND THE SOURCES OF GROWTH OF NON-TRADITIONAL USES OF THE MUNICIPAL BOND MARKET

As mentioned in chapter 2, we have defined non-traditional uses of the tax-exempt, municipal bond market to encompass five types of bonds: industrial development, housing, pollution control, hospitals, and student loans. Following is a brief description of each. Table 18 details the trends in the growth of both traditional and non-traditional borrowing.

Industrial development bonds

A State, municipality, or special authority issues industrial development bonds (IDBs) to finance a facility for a private corporation. [1]/ The facility is either leased to the private corporation at a rate sufficient to pay off the bonds, or the bond proceeds are lent directly to the business. The interest costs on the lease or loan are lower than the taxable market interest rates because the funds were raised at tax-exempt rates.

Basically two types of IDBs exist, unrestricted and "small issue." The unrestricted bonds are used to finance projects such as housing, sports stadiums, airports, convention centers, etc. Their use for pollution control, hospitals, and housing are described separately. Small issues are primarily used for economic development. Federal law limits their size to $10 million.

Because IDBs do not generally affect the issuing jurisdiction's debt burden or creditworthiness, the issuing body has few, if any, risks. The only case where credit ratings might be affected is if the bonds were also backed up by a State or locality's general taxing authority.

Small issue IDBs

The volume of IDBs remained low up to the 1960s, but by 1968, some 40 States had authorized their use. Large corporations began using them to finance expansions, and their volume rose to $1.8 billion in 1968. The Congress responded by limiting their use in the Revenue Expenditure and Control Act of 1968. Under current law, issues for private business development may

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[1]/The Municipal Finance Officers Association makes a distinction between industrial development bonds (IDBs) and industrial revenue bonds (IRBs). Since there is no legal differences, we do not make a distinction. MFOA defines IDBs as the type of debt in which the issuer is a taxing authority which in part or in whole supports the bonds with its taxing authority. IRBs are secured by revenues of the property being financed without any pledged of general revenues by a tax-levying governmental entity.

not exceed $10 million. Today, 47 States issue IDBs with more than half placing no restrictions on the purposes for which they may be used. In the early 1970s, most IDBs were used for manufacturing facilities, but by 1980 they were used for commercial, retail and private uses, including shopping malls and private sports clubs. The growth in small IDBs was partially obscured because most of these bonds were privately placed and were not publicly reported.

However, a 1981 CBO study documented the dramatic expansion in volume since 1975. [2/] The massive volume and diversification of uses drew attention to the program because of the associated Federal tax revenue losses and some sensational misuses of bond proceeds. Many questioned the policy objectives of using small issue IDBs and their potentially adverse effects on the tax-exempt market for more traditional bonds. Efforts were made in the Congress to eliminate or sharply curtail their use. Opponents were unsuccessful in instituting any immediate changes, but the 1982 Tax Act defines and restricts some abuses and provides for the expiration of the tax exemption by December 31, 1986.

Housing bonds

Borrowing for housing is generally in the form of revenue bonds, which are used to finance multifamily rental or single-family housing for low or moderate income families. In some States, they are used for home improvement loans and to support housing for the aged and veterans. The U.S. Department of Housing and Urban Development supports many of the multi-family bonds through the Section 8 housing program.

State housing agencies are the primary issuers of multi-family bonds, while local governments and authorities are frequent issuers of single family bonds. For multifamily issues, the bond proceeds are lent to developers; for single family issues, mortgages are issued through local lending institutions hired by the bond issuer to process the applications.

The volume of State and local housing bonds rose sharply in the late 1970s, from a total of $1.6 billion in 1975 to $14.3 billion in 1982. In 1982, housing bonds constituted 18 percent of the entire long-term bond market and 59 percent of the short-term market, which is largely HUD public housing project notes.

The rapid growth in housing bonds, especially for single family mortgages, prompted the Congress to restrict their use because of increasing Federal tax revenue losses and a concern that the volume of housing bonds would contribute to further increases in interest rates on tax-exempt bonds issued for more traditional purposes. The Mortgage Subsidy Bond Tax Act of 1980

[2/]Congressional Budget Office, "Small Issue Industrial Development Bonds," Washington, D.C.; September 1981.

(P.L. 96-449) placed State-by-State annual limits on aggregate bond sales, required that most eligible buyers be first-time homeowners, and limited the purchase price of houses. The Act also eliminated the tax exemption for all single family housing bonds after December 31, 1983. 3/

The sharp drop in the volume of new sales of these bonds in 1981 has been attributed to the combined effects of a poor housing market, unfavorable bond market conditions, and bond investor uncertainty pending the issuance of Federal regulations implementing the 1980 Act. In 1982, issuances exceeded the 1980 level, in part because of later amendments liberalizing certain restrictions in the 1980 Act and because of declining bond yields that improved the market for housing bonds.

Pollution Control

Pollution control bonds are industrial development bonds; however, they are generally exempt from the dollar restrictions placed on small issue IDBs. They are the largest category of unrestricted IDBs now being issued. Private industry spent $8 billion on capital investment for pollution control purposes in 1981. Nearly 55 percent of this was financed with tax-exempt revenue bonds.

The Water Pollution Control and Clean Air Acts of the early 1970s made large scale investment by industry mandatory. 4/ States and localities began to use their tax-exempt status to provide low cost loans to the private sector for pollution control in 1971. Since then, publicly reported pollution control bonds climbed to $5.3 billion, or 6 percent of the total market in 1982.

Hospital Facilities

Debt financing has also increased signficantly in the area of hospital facilities. While States and localities have in the past constructed and operated many of these facilities, more

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3/A good summary of the first year of implementation of this Act can be found in a Congressional Budget Office working paper, "The Mortgage Subsidy Bond Tax Act of 1980: Experience Under the Permanent Rules," March, 1982. See also our report, "The Costs and Benefits of Single-Family Mortgage Revenue Bonds: Preliminary Report," GAO/RCED-83-145 (April 18, 1983).

4/The Water Pollution Control Act Amendments of 1972 (P.L. 92-500) Clean Water Act of 1977 (P.L. 92-217), Clean Water Act Amendments, (P.L. 96-483), Municipal Wastewater Treatment Construction Grant Amendments of 1981 (P.L. 97-117), The Clean Air Amendments of 1970 (P.L. 91-604) and Clean Air Act Amendments of 1977 (P.L. 95-95).

recently there has been a strong "privatization" trend. This trend, however, is subsidized by using the State and local tax-exempt borrowing powers. Of total State and local borrowing for these purposes, the Bureau of Economic Analysis estimates that 80 percent is done on behalf of private, non-profit facilities.

Student loans

Tax-exempt funding for student loans started in 1976 and has grown steadily. This has, in part, been a response to cutbacks in Federal aid and the growing costs of a college education. In 1982, $1.6 billion was raised for student loans in the long-term tax-exempt market.

At least 12 States operate loan programs for State residents to finance their higher education costs. In addition, five States have established special authorities that permit private colleges to issue their own tax-exempt bonds to provide assistance to their own students. Dartmouth College, the first private university to take advantage of this opportunity, raised $12 million in 1982 to provide loans to its students.

TRENDS IN THE VOLUME OF NON-TRADITIONAL USES OF BONDS

Table 18 details the growth of the five categories of non-traditional bonds since 1970 in comparison with changes in the more traditional forms of public infrastructure. These figures are primarily based on PSA data but are supplemented by data from the Bond Buyer, U.S. Treasury, Federal Reserve Board and Congressional Budget Office. The total volume figures have been adjusted upward from the figures reported by PSA in appendix IV to compensate for unreported small issues industrial development bonds. The unreported small issue IDB figures are based on CBO estimates. The "other/unidentified" category under Traditional Public Purposes is a residual remaining after accounting for all other categories in the table.

Table 18

Trends in the Volume of New Long-Term Tax-Exempt Bonds By Traditional and Non-Traditional Purposes, 1970-1982
($ in billions)

Traditional Public Purposes	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Education	5.0	5.7	5.0	4.8	4.7	4.4	4.9	5.0	4.7	4.6	4.1	3.4	4.7
Transportation	3.2	4.3	3.0	1.6	1.7	2.2	3.0	3.0	3.5	2.4	2.6	3.5	6.2
Water & Sewer	2.2	3.2	2.4	2.3	2.0	2.5	3.0	3.3	3.3	3.1	2.9	2.9	5.0
Public Power	1.1	1.3	1.2	1.6	1.5	2.2	2.7	3.4	4.5	3.5	3.4	6.3	7.1
Other/Unidentified	5.7	7.3	6.8	3.6	7.6	11.6	10.5	11.4	11.4	8.2	9.5	10.1	16.8
Total	**17.2**	**21.8**	**18.4**	**13.9**	**17.5**	**22.9**	**24.1**	**26.1**	**27.4**	**21.9**	**22.5**	**26.2**	**39.8**
Non-Traditional Purposes													
Housing	0.7	2.1	2.2	3.2	1.9	1.6	3.4	3.7	6.1	12.4	15.8	6.2	14.3
Industrial Development	0.1	0.1	0.3	2.7	0.5	1.3	1.5	2.2	3.4	7.1	9.2	12.6	12.7
Pollution Control	-	-	0.6	1.7	2.2	2.5	1.9	2.6	2.7	2.1	2.3	4.3	5.3
Hospitals	-	0.4	0.5	0.7	0.8	2.0	2.3	3.3	2.1	3.4	3.6	5.4	9.5
Student Loans	-	-	-	-	-	-	0.1	0.1	0.3	0.6	0.5	1.0	1.6
Total	**0.8**	**2.6**	**3.6**	**8.3**	**5.4**	**7.4**	**9.2**	**11.9**	**14.6**	**25.6**	**31.4**	**29.5**	**43.4**
Refundings	0.1	0.5	1.7	1.6	0.7	1.1	3.2	8.8	8.7	1.2	2.0	1.3	4.3
Total	**18.1**	**24.9**	**23.7**	**23.8**	**23.6**	**31.4**	**36.5**	**46.8**	**50.7**	**48.7**	**55.9**	**57.0**	**87.5**

- Figures not available.

Sources: Public Securities Association, Municipal Finance Officers Association, Treasury, Congressional Budget Office and Federal Reserve Board. Methodology developed by the National League of Cities.

Note: These figures are primarily based on PSA data. Other sources are used where PSA data are not available. CBO estimates are used for small issue IDBs beginning in 1975 and total volume figures are adjusted accordingly to compensate for their increase above PSA's publicly reported amount. IDB figures for 1982 are preliminary estimates. Unadjusted totals appear in Appendix IV.

APPENDIX VI

Composition Of Federal Grants-In-Aid To States And Localities For Physical Investment, FY 1970-1982
($ in millions)

	1970	1971	1972	1973	1974	1975	1976	TQ	1977	1978	1979	1980	1981	1982
Transportation														
Highways	4,311	4,570	4,601	4,644	4,378	4,589	6,144	1,605	5,884	5,940	7,119	8,952	8,832	7,730
Urban mass transportation	119	187	259	358	503	687	946	265	1,307	1,358	1,700	2,038	2,596	2,588
Airports	83	62	106	232	243	292	269	26	335	562	556	590	469	339
Total transportation	4,514	4,818	4,966	5,235	5,123	5,568	7,360	1,896	7,526	7,860	9,376	11,580	11,897	10,657
Community and regional development														
Block grants	---	---	---	---	---	38	983	439	2,089	2,464	3,161	4,126	4,042	3,792
Urban renewal	1,054	1,026	1,218	1,010	1,205	1,374	1,166	295	899	392	298	206	167	101
Public works acceleration/local public works	1	*	*	---	---	---	---	---	577	3,057	1,741	416	83	40
Other	570	900	1,104	1,279	1,180	1,082	667	159	604	628	895	1,039	1,268	1,239
Total community & regional development	1,624	1,927	2,322	2,289	2,386	2,494	2,816	894	4,169	6,542	6,095	5,787	5,560	5,170
Natural resources and environment														
Pollution control facilities	176	478	413	684	1,553	1,938	2,429	920	3,430	3,187	3,756	4,343	3,881	3,756
Other	189	169	214	230	299	338	360	97	376	410	513	562	600	314
Total natural resources and environment	365	648	627	915	1,852	2,276	2,788	1,016	3,906	3,597	4,269	4,906	4,482	4,070
Other														
Health	230	221	294	211	256	306	361	64	330	212	132	10	32	11
Education, training, development, and social services	257	222	146	124	74	86	44	29	66	12	27	25	5	37
Other functions	50	22	38	60	114	111	89	28	98	80	107	120	140	174
Total other	537	465	478	395	444	502	494	122	494	305	265	155	177	222
Total, current	7,040	7,858	8,393	8,834	9,805	10,840	13,458	3,927	16,094	18,304	20,005	22,428	22,115	20,120
Total, 1972 constant $ (in billions)	8.1	8.4	8.4	8.4	8.4	7.9	9.4	2.8	10.7	11.4	10.6	10.6	9.8	8.7

SOURCE: U.S. Office of Management and Budget.

* less than $1 million.

APPENDIX VII

APPENDIX VIII

Long-Term Tax-Exempt Volume Trends for General Obligation and Revenue Bonds, 1970-82

Year	Total Volume	General Obligation		Revenue	
		Volume	Percent of Total Volume	Volume	Percent of Total Volume
1970	$18,082,509	$11,851,771	65.5%	$ 6,230,738	34.5%
1971	24,929,063	15.218,492	61.1	9,710,571	38.9
1972	23,692,402	13,329,018	56.3	10,363,384	43.7
1973	23,821,477	12,169,799	51.1	11,651,678	48.9
1974	23,584,809	13,126,341	55.7	10,458,468	44.3
1975	30,659,442	15,974,335	52.1	14,685,087	47.9
1976	35,415,683	18,200,098	51.4	17,215,585	48.6
1977	46,705,886	18,118,339	38.8	28,587,547	61.2
1978	48,189,731	17,789,591	36.9	30,400,140	63.1
1979	43,308,907	12,090,955	27.9	31,217,952	72.1
1980	48,367,802	14,102,312	29.2	34,265,490	70.8
1981	47,724,616	12,392,648	26.0	35,331,968	74.0
1982	77,294,539	20,879,301	27.0	56,415,238	73.0

SOURCE: Public Securities Association

APPENDIX IX

Long-Term Bond Volume By Type Of Sale, Competitive vs. Negotiated, 1970-82 Percentage of Volume by Type of Offering

Year	Competitive	Negotiated	Private Placement	Other
1970	83.1%	16.7%	0.2%	0%
1971	81.8	18.0	0.2	0
1972	75.6	24.2	0.2	0
1973	71.5	28.2	0.3	0
1974	70.2	29.4	0.4	0
1975	63.4	34.6	1.7	0.3
1976	57.8	36.5	4.8	0.9
1977	49.9	45.5	3.6	1.0
1978	44.3	50.4	5.0	0.3
1979	42.8	53.3	3.5	0.4
1980	40.3	57.5	1.9	0.3
1981	34.3	61.3	4.2	0.2
1982	31.2	67.9	0.8	0.1

SOURCE: Public Securities Association

APPENDIX X

Composition Of Holdings Of Outstanding State And Local Debt by Major Investor Groups, 1970-82
Year End Outstanding
($ in billions)

Year	Households	Commercial Banks	Non-Life Ins. Co.	Other	Total
1970	$46.0	$70.2	$17.0	$11.2	$144.4
1971	46.1	82.8	20.5	12.4	161.8
1972	48.4	90.0	24.8	13.3	176.5
1973	53.7	95.7	28.5	13.6	191.5
1974	61.9	101.1	30.7	14.0	207.7
1975	68.1	102.9	33.3	19.5	223.8
1976	70.1	106.0	38.7	24.7	239.5
1977	70.1	115.2	49.4	28.2	262.9
1978	72.7	126.2	62.9	29.5	291.3
1979	82.7	135.6	72.8	30.0	321.1
1980	94.6	149.2	80.5	32.6	356.9
1981	115.0	154.2	84.5	36.1	389.8
1982	161.8	153.9	86.8	48.0	450.5

SOURCE: Federal Reserve Board, Flow of Funds Accounts, various years.

APPENDIX XI

Net Purchases Of New Bonds by Major Investor Groups, 1970-82 ($ in billions)

Year	Households	Commercial Banks	Non-Life Ins. Co.	Other	Total
1970	$ -0.9	$10.7	$ 1.5	$ -0.1	$11.2
1971	0.1	12.6	3.5	1.3	17.5
1972	2.3	7.2	4.3	0.9	14.7
1973	5.3	5.7	3.6	0.1	14.7
1974	8.3	5.4	2.2	0.6	16.5
1975	6.2	1.8	2.6	5.5	16.1
1976	2.0	3.0	5.4	5.3	15.7
1977	-1.5	9.2	10.7	3.5	21.9
1978	4.1	9.6	13.5	1.2	28.4
1979	9.8	9.5	9.9	0.6	29.8
1980	12.2	13.6	7.7	2.4	35.9
1981	20.4	5.0	4.0	3.5	32.9
1982	40.9	4.6	2.5	11.5	59.5

NOTE: The large increase in the "other" category is due to increases in mutual funds, which are indirect purchases by households. It is estimated that $10.9 billion of the "other" category was mutual funds in 1982.

SOURCE: Federal Reserve Board Flow of Funds Accounts and Federal Reserve Bulletin, various years.

APPENDIX XII

ANALYSIS OF BOND POSTPONEMENTS AND CANCELLATIONS, 1974-82

Our statistical analysis of bond postponements and cancellations began by looking at simple pairwise correlation coefficients. These coefficients were calculated for monthly data over the 1974-82 period. We found that postponements and cancellations moved in the same direction as the level of interest rates and the change in interest rates (see table 6). The correlations, however, do not answer the question of how sensitive postponements and cancellations were to levels and changes in the interest rate. Nor do the correlation results show the relative importance of the interest rate to other factors in determining postponements and cancellations.

We used regression analysis to address the more complex issues of sensitivity and relative importance. The model is as follows:

$$P = a_0 + a_1R_1 + a_2R_C + a_3L + a_4T + a_5NB + a_6BR$$

where P = volume of postponements and cancellations per month

R_1 = monthly average level of interest (in basis points) for Aa-rated bonds

R_C = monthly change in the interest rate

L = percent share of total postponements for each year due to legal interest rate ceilings as specified in the Federal Reserve data

T = percent share of total postponements for each year due to technical problems

NB = percent share of total postponements for each year due to no bid offers by underwriters

BR = percent share of total postponements for each year due to the rejection of all bid offers by issuers

Our results show that change in the interest rate was the most important factor in determining postponements and cancellations (see table 19). This result suggests that bond issuers paid careful attention to interest rate fluctuations and were apt to delay an issue if the interest rate changed more than their initial expectations. Legal ceilings and the interest rate level were next in importance, in terms of the standardized beta coefficients. Technical difficulties were also significant but less than half as important as interest rate changes.

We also attempted to discern if traditional uses of bonds were delayed or cancelled more often than non-traditional uses. We did not notice a significant difference.