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# Public Policy Brief

## **A New Approach to Tax-Exempt Bonds**

Infrastructure Financing with the AGIS Bond

*Edward V. Regan*

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# Preface

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Economists generally agree that the accumulation of public capital is an important factor in raising living standards and improving long-run productivity. As Keynes recognized long ago, public investment, at some critical share of total investment, can dampen the amplitude of business cycles. Because the benefits from investment in transportation, education, health, the environment, and other such projects are inherently public in nature, federal government involvement in undertaking projects or in subsidizing them is a long-standing feature of public finance in this country and elsewhere.

State and local governments play a major role in public capital accumulation. The federal government subsidizes that role directly by grants and, to a significant degree, indirectly through the tax exemption of interest payments on municipal bonds. However, in spite of the widely recognized importance of public investment and federal involvement, discussion of financing public capital through tax-exempt bonds has been confined to narrow academic and policy circles. In this brief, Policy Advisor Edward V. Regan demystifies the current system, exposes its weaknesses, and presents an alternative.

Regan finds the current system of tax exemption to be both inefficient and inequitable. It is inefficient because the borrowing costs of state and local governments are not reduced by the full amount of the federal subsidy. It is inequitable because the portion of the federal subsidy that never reaches state and local governments accrues to the wealthiest investors. This undesirable state of affairs arises because the primary municipal bond market (consisting of high-bracket taxpayers looking mainly for tax

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Regan also argues that because of regulations governing large institutional investors' participation in the tax-exempt market, the current system has produced an isolated and exclusively domestic bond market that excludes access to trillions of dollars of assets. In contrast, other industrial countries allow domestic and foreign corporations, banks, pension funds, and individual investors to participate in financing public investment. A broadening of the market would not only make assets available; it would also lead to the stable institutional oversight characteristic of taxable and global bond markets so that the potential for unfortunate scandals such as the Orange County bankruptcy would be reduced.

Regan and his associates have developed a new security concept, the American global infrastructure security, to overcome the weaknesses they see in the current system. By decoupling and then selling separately the two components of the municipal bond—tax exemption and income flow—the AGIS becomes competitive in two separate markets: investors who seek primarily tax sheltering and those who seek yield. As a result of the “stripped” tax-exemption privilege, the effective interest rate for the issuer would be reduced, compared to the current rates, and the federal subsidy would be closer or equal to the federal tax loss.

# A New Approach to Tax-Exempt Bonds

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American taxpayers undoubtedly know that their states and cities help pay for sports stadiums. But how many fans know that, thanks to tax-exempt bond financing, up to a third of their subsidy winds up in the hands of investors in high tax brackets rather than in the stadium itself. A Congressional Research Service study estimates that, for every \$225 million stadium, the federal Treasury loses an average of \$70 million in forgone tax collections to the purchasers of these tax-exempt bonds (Zimmerman 1996, 9–10).

Rarely is it asked whether there are better ways to finance sports facilities. And it is doubtful that more than a handful of taxpayers are aware of how this subsidy operates, for the subject of tax-exempt municipal bonds is highly complex and is rarely discussed in the popular press.<sup>1</sup> It works this way. By exempting interest payments on municipal debt from federal income taxes, the federal government lowers the cost of borrowing to state and local governments. Purchasers of municipal bonds are willing to accept a lower rate of interest because they receive interest payments that are tax free.

The subsidizing of state and local expenditures is justified because these bonds, in most cases, finance beneficial and worthy public projects—roads, bridges, schools, and water systems—that produce economic and social benefits for the communities in which they are undertaken and which spill over to other jurisdictions. This is why, in addition to the federal tax-exempt subsidy, there are numerous direct federal grants for these infrastructure projects.

There are, however, drawbacks to the current form of the tax-exemption given to municipal bonds. When a state or local government sells a tax-exempt bond, a substantial portion of the federal subsidy never reaches the issuing government. The Congressional Research Service study indicates that thirty-five cents of every dollar coming out of taxpayers' pockets is diverted into the pockets of investors in the highest tax brackets. Another drawback is that the current system excludes commercial banks, public and private pension funds, foundations, and endowments—with assets of trillions of dollars. In contrast, other countries can make full use of private domestic and global capital markets to finance their public facilities. A federal subsidy of state and local infrastructure is appropriate and clearly needed, but the current form of tax-exemption distorts the function of capital markets. Eliminating this distortion would unlock the trillions of dollars of potential bidding assets and would eliminate the transfer of wealth from ordinary taxpayers to high tax bracket investors.

Tax exemption was long thought to be anchored in the U.S. Constitution; the Constitution was interpreted to mean that the federal government was blocked from taxing state activities. In 1988, however, the Supreme Court reached a different conclusion: in *South Carolina v. Baker* it held that municipal tax exemption is not protected by the doctrine of intergovernmental tax immunity and can be altered through normal federal legislative processes.<sup>2</sup>

This holding and the growth of pension and bond funds and global capital markets stimulated a search for alternatives to traditional tax-exempt bonds to overcome their inefficiency and inequity. I and a group of municipal bond experts—Peter Imhoff and Mark Mayer, currently of the investment banking firm Warburg Dillon Read, and Eugene W. Harper Jr. and Jeffrey L. Piemont, currently of the law firm Squire, Sanders & Dempsey—developed a new security concept, called the American global infrastructure security or AGIS. The AGIS bond involves stripping the tax-exempt privilege from a tax-exempt bond, thus making the bond taxable, and selling the tax-exempt privilege separately (somewhat similar to the way low-income housing tax credits are sold) in the financial markets. Under this system the issuer would get the full subsidy it should be receiving and for which the average taxpayer is paying.



The AGIS concept needs to be tested. Hundreds of municipal jurisdictions are hard pressed for revenues, even in a booming economy. For them, the present system, though flawed, provides a needed subsidy. They and all other state and local governments would not want to change unless it could be documented that they would not lose any of the benefits and privileges they now have and that their subsidy would actually be improved.

Three recently proposed federal programs suggest a framework for a pilot program to test the validity of our proposal. Rep. Charles B. Rangel (D–N.Y.) has introduced the Public School Modernization Act of 1999 (H.R. 1660); Rep. Jennifer Dunn (R–Wash.) has introduced the Highway Innovation and Cost Savings Act (H.R. 869). It has been reported that the vice president’s office is working with Sen. Max Baucus (D–Mont.), of the Committee on Environment and Public Works, on legislation for environmental projects. All these proposals expand the scope of existing tax benefits in connection with the issuance of municipal bonds: The public school and environmental proposals involve stripping tax credits from the principal payments on bonds; the highway proposal is intended to provide tax-exempt financing for privatized toll roads. Because they are themselves one-time test programs, these proposals could be adapted to include the AGIS. Or, the AGIS proposal could be adapted, in a pilot program fashion, to cover a major, but limited, sector such as transportation, health care, or housing.

This paper first explains why investment in infrastructure by state and local governments is necessary. It then explains why the tax-exempt municipal bond has not worked well. Finally, it presents the AGIS solution to the problem. The appendixes provide a technical explanation of the efficiency of the tax exemption and a short history of municipal bonds.

### **The Need for State and Local Investment in Infrastructure**

Good public infrastructure improves productivity, strengthens economies, and in the process makes for better quality of life. Broadly defined, infrastructure includes roads, bridges, and other transportation

facilities; drinking water, sewage, and other environmental facilities; and schools, public utilities, hospitals, universities, and other facilities for public use. No one doubts that the building, constant maintenance, and replacement of infrastructure are essential and that these are tasks for state and local governments.

Most of the money that states and municipalities spend on infrastructure is raised by issuing tax-exempt municipal bonds. Tax exemption helps to lower state and local governments' cost of borrowing. If the tax-exempt market did not exist, all municipal borrowing would have to take place in the regular "taxable" markets—the traditional capital markets that accommodate U.S. Treasury and corporate (and occasional municipal) borrowing and where interest costs are approximately 15 to 20 percent higher than in the tax-exempt markets (U.S. General Accounting Office 1995, 15). The magnitude of the subsidy to state and local governments depends on the timing of the bond issuance and the vagaries of interest rates. For example, since 1990 the average spread in interest rates between long-term tax-exempt municipal bonds and taxable Treasury bonds has been 87 basis points (or 0.87 percent),<sup>3</sup> but at many times during this decade state and local governments were paying interest on tax-exempt bonds at rates higher than the interest rates on taxable Treasuries in other years. The narrowing and widening of the differential is a natural feature of the securities market.

How much infrastructure investment is needed? For transportation facilities alone, the Department of Transportation estimates that we need to invest \$16 billion more than what is currently spent annually on highways, \$10 billion more on airports, and \$13 billion more on transit (cited in Shuster 1997). The DOT estimates that, of the 42,000 highway fatalities each year, up to 30 percent are caused by unsafe roads and bridges (Goodrich 1997). A study released by the Surface Transportation Policy Project (1997) estimated the cost to American drivers of poorly maintained roads at \$4.8 billion annually in car repairs. The report found that 58 percent of urban, suburban, and interstate highways are in fair to poor condition and more than 26 percent need repair now or will need it soon. Even if these estimates are high, they confirm our perception that more spending on infrastructure would be desirable.

A number of academic studies in the early 1990s tackled the question of the appropriate amount of investment through macroeconomic estimates of the effects on economic growth of investment in public capital projects. The studies produced widely varying findings, except for those focused on individual industries.<sup>4</sup> The Federal Highway Administration, for example, found that the manufacturing sector as a whole realizes significant cost savings from good transportation networks through savings in inventory costs, adequate distribution systems, and access to larger input and labor markets (Keane 1996). The administration also found that recent highway investments yielded significantly positive rates of return in that sector. Transportation infrastructure also plays a positive role in the communications, public utilities, and retail trade and services industries. A study conducted by Regional Financial Associates showed that regions that invested more than the national average in infrastructure experienced better than average job growth, and regions that spent less had less job growth (Bleakley 1997).

The message has apparently been heard in state capitols and city halls. Many municipalities use investment in infrastructure as a lure for corporate plant and office relocations. The period of reduced spending in infrastructure appears to be over. Spending rose in the 1990s after stagnating throughout the 1970s and 1980s. Infrastructure investment as a percentage of total nonresidential construction increased to an annual average 24 percent in the 1990s, compared to an average 19 percent in the 1980s (Bleakley 1997).

## **Problems with Tax Exemption of Municipal Bonds**

### **Transfer to High Tax Bracket Investors**

The tax exemption on income from municipal bonds is a subsidy provided to states and municipalities by the federal government by exempting interest payments to bondholders from federal income taxes. The total revenue lost by the federal Treasury as a result of the exclusion of interest on all outstanding state and local bonds was estimated to be \$22 billion for fiscal year 1998;<sup>5</sup> the exclusion of interest ranked as the

eighth largest federal revenue loss incorporated in the income tax rules (Executive Office of the President 1997, Tables 5-1, 5-6).

The problem is not that the federal government subsidizes infrastructure construction—we believe it should—but that this is a poor way to go about it. While the federal government forgoes an estimated \$22 billion in tax collections each year in order to provide the subsidy, state and local government units collectively save only an estimated \$14.7 billion on their interest costs. The remainder is picked up by middle-income and wealthy investors. The loss of subsidy to states and localities and the amount siphoned off by investors are not intentional outcomes of tax legislation; no law was ever passed allowing individuals to share in the infrastructure subsidy.

To understand why this occurs, we must examine how the tax exemption operates (a theoretical formula is given in Appendix A). Begin with a “taxable” bond from the alternative marketplace for municipal borrowing. We estimate that from 1986 to 1995 an average interest rate on taxable bonds (including both Treasury and corporate bonds) was 8.3 percent.<sup>6</sup> An investor in the top tax bracket of 39.6 percent would be indifferent between purchasing a taxable bond yielding 8.3 percent interest from which 3.3 percent of the interest would go to taxes ( $8.3 \times 39.6 = 3.3$  percent) and a tax-exempt bond yielding 5.0 percent. Assuming all else equal, the taxable bond at 8.3 percent (on which the investor pays an *explicit* tax of 39.6 percent to the federal government) provides an after-tax yield equivalent to that of a tax-exempt municipal

#### **Box 1 Muni Bond Markets: Facts and Figures**

Municipal bond markets in the United States are broad and active. The total outstanding tax-exempt debt in 1997 was about \$1.3 trillion. Of the roughly \$173 billion in new issues of long-term municipal bonds in 1997, 83 percent (or \$144 billion) were tax exempt; the remainder were classified as taxable or subject to the minimum tax. Local governments and their authorities issued 60 percent of municipal bonds in 1997; state governments and their agencies issued the remainder.

bond priced at 5.0 percent (on which the investor pays an *implicit* tax of 39.6 percent in the form of reduced interest). On a tax-exempt bond issued at 5.0 percent, the municipal government would save 3.3 percent in borrowing costs over a comparable taxable bond, while the federal government would lose 3.3 percent in tax collections. As far as taxpayers are concerned, the federal subsidy of municipal borrowings would be a wash. However, what happens in the marketplace is not so straightforward. The actual average interest rate on *The Bond Buyer's* 20-bond index of tax-exempt municipal bonds between 1986 and 1995 was 6.8 percent (*The Bond Buyer* 1997a,b).

The reason is this. Most individuals holding municipal bonds are in relatively high tax brackets.<sup>7</sup> However, the amount of municipal borrowing each year outstrips the capacity and willingness of high-bracket taxpayers to invest in fixed-income securities such as municipal bonds. So issuers must increase the interest coupon from what it would take to attract the high-bracket taxpayers to a yield that will attract also taxpayers in lower brackets (Michael 1990, 1672). Thus, although a disproportionate share of long-term tax-exempt bonds is held by the investor in the highest tax brackets, the interest rate is determined by the marginal investor who is in a lower bracket (estimated by various analysts as low as 15 percent; see Michael 1990).

Taxpayers in lower tax brackets require higher yields on tax-exempt bonds in order to switch from taxable investments. An investor in the 28 percent tax bracket would need a tax-exempt interest rate of 6.0 percent to receive a yield equivalent to that of a taxable investment at 8.3 percent. A taxpayer in the 15 percent bracket would require a rate of 7.1 percent.

As the yield on municipal bonds rises to attract lower-bracket investors, investors in the higher tax brackets reap ever larger windfalls. For each 6.8 percent bond purchase by an individual in the 39.6 percent tax bracket, the federal government loses 3.3 percent in tax collections, but the municipality saves only 1.5 percent in costs. What happens to the missing 1.8 percent? It accrues to the rich bond purchaser who receives 6.8 percent interest instead of the 5 percent at which the bond would have been issued had there been sufficient investors at that rate. (Bond

purchasers in intermediate tax brackets also gain and the federal government loses taxes on them, but proportionately less so.) Average taxpayers nationwide are the ones paying for these windfalls to the wealthy.

The total dollar amounts involved are significant. On the approximately \$144 billion in new long-term tax-exempt municipal bonds issued in 1996, using the same average interest rates as above, state and local governments saved about \$2.2 billion in interest costs. Assuming an average tax bracket of 28 percent, the federal revenue loss was about \$3.3 billion, of which \$2.2 billion constituted the subsidy to the municipalities and the remaining \$1.1 billion went to investors. Applying the same ratios to the \$1.3 trillion of outstanding municipal debt and the 1998 projected federal revenue loss of \$22.0 billion, municipalities will benefit by \$14.7 billion and \$7.3 billion will go to investors. Thus the historical method of financing state and local public works can be faulted on two grounds. The subsidy is highly inefficient, with a third of the federal expenditure never reaching its intended recipient, and the inefficiency is associated with an inequitable transfer of wealth from the average taxpayer to the wealthy bondholder.

### **Exclusion of Potential Assets**

A second problem with the current tax exemption lies in the composition of the market for municipal bonds. The tax exemption has produced an isolated and exclusively domestic municipal bond market, which excludes large institutional investors with their huge pools of capital. Table 1 shows how the composition of investors in the municipal bond market changed in the aftermath of the U.S. Treasury and IRS rulings and the 1986 Tax Reform Act, which changed the tax treatment of institutional holdings of tax-exempt bonds. As a result—and given the fact that pension funds have never participated—the municipal bond market is patronized by few large institutional investors, which would ordinarily exercise oversight of market practices.

The 1986 act closed several tax-exemption loopholes and required interest on all municipal securities to be entered into corporations' computation of their minimum tax (Godfrey 1995). As a result, corporations and commercial institutions, especially banks, significantly divested themselves of

municipal bonds, an ironic consequence of the reform in light of banks' historical interest in being "good citizens" in their communities and their involvement as stable investors in municipal bonds. Simultaneously, the combined holdings of individual households and mutual and money market funds increased. By 1995 about three quarters of outstanding municipal bonds were held by individuals or their proxies (mutual funds and bank personal trusts).

**Table 1 Investors in Municipal Debt (Percentage)**

	1985	1995
Households	40.5	34.2
Commercial banks	27.3	7.4
Mutual and money market funds	8.3	26.1
Insurance companies	11.4	13.4
Bank personal trusts	5.6	8.0
Pension funds	0.0	0.1
Other	6.9	10.8

Source: *The Bond Buyer* (1997b).

Pension funds, another appropriate source of capital for public investments, have always been in effect barred from the tax-exempt bond market. Their fiduciary role imposes an obligation to maximize return, so with a wide choice of investments available, they do not invest in lower-yielding tax-exempt bonds to achieve a benefit (tax exemption) they already have. With assets of over \$8 trillion, pension funds represent the largest single investment pool in the country (The Conference Board 1996, 15). They are currently invested in virtually every other recognized asset class, such as stocks, bonds, real estate, and venture capital, in both the United States and abroad.

In other industrial countries the pension funds are often active participants in infrastructure financing, through bond purchases and through loans to local or central governments. Of the ten largest pension funds in the world, six are public pension funds ("P&I/InterSec World 300" 1995), and all six are strong players in infrastructure investment (see Box 2). The lesson is clear. In many industrialized countries, if public pension funds have the opportunity to invest in infrastructure, they do so, sometimes quite extensively. They recognize it is a wise investment that also responds to community needs.

**Box 2 Foreign Pension Funds and Public Investment**

Algemeen Burgerlijk Pensioenfonds in the Netherlands, the second largest pension fund in the world, invests 37 percent of its assets in government loans or bonds, a substantial amount of which goes toward public infrastructure such as water projects, highways, and railroads. In Japan, premiums from the four “national annuities” (public pension funds), which rank in the top 10 pension funds worldwide, are collected and pooled at the Ministry of Finance and then invested in securities and loans, mostly for public works and housing loans. The Swedish Allmänna Pensionsfonden, seventh largest pension fund in the world, invests massively (46 percent of its assets) in housing projects, most of which receive direct government subsidies.

Several foreign pension funds are also poised to participate in private-public partnerships. Privatization was introduced into British infrastructure financing in the early 1980s; hundreds of projects are now under development and are bid under the Private Finance Initiative. Commercial banks are currently the main source of financing for these projects, but pension funds appear interested in assuming both senior and subordinated debt for PFI projects. Canadian pension funds are similarly ready to become involved in infrastructure, mostly through obtaining equity in companies that invest in infrastructure.<sup>8</sup>

The local community interest expressed in foreign pension funds’ infrastructure investment highlights an apparent lack of such concern in U.S. public pension portfolios—a condition often taken advantage of by politicians. For example, governors of large states have sometimes tapped pension funds to balance their budgets. Politicians and social activists may pressure state pension funds to invest in “economically targeted investments” (ETIs), such as below-market housing projects and business start-ups that did not obtain conventional financing. Although some studies show that average returns on ETIs are acceptable, many states have lost money on them. Suffice it to say, ETIs are not a standard asset class with historical return and credit rating measurements and would likely disappear from portfolios if the public funds could buy taxable state and local bonds with good credit ratings and interest payments above Treasury yields. Additionally, aggressive bidding for such bonds would undoubtedly help bring down government interest costs.<sup>9</sup>



### **Lack of Stable Institutional Oversight**

With a historical default rate of less than 1 percent, municipal bonds have long had healthy credit ratings and public sector issuers and the municipal bond market have operated in exemplary fashion (Godfrey 1995).<sup>10</sup> However, in the opaque municipal bond market, public sector borrowers do not face the same probing oversight as do corporate borrowers, which operate in the spotlight cast by large financial institutions and the global capital markets.

In the past few years there have been some ethical scandals in connection with municipal bond offerings. Several prominent securities firms have been charged with conspiracy and fraud, some state and local governments and their underwriters have been investigated by the SEC for arbitrage abuses, and the IRS is reportedly conducting audits regarding the use of private-activity bonds.

The lack of oversight is no better illustrated than in the singular, but well-publicized billion-dollar bankruptcy of Orange County, California. There were several public suggestions in advance of the bankruptcy that the actions of a particular investment officer were putting the county in a precarious financial position. Intervention by a responsible community of financial lenders (which might have included such powerhouse institutions as Calpers, the California pension fund, and the Bank of America) might have saved the situation. Instead, the Orange County “financial community” consisted of widely scattered individuals and a few bond funds, and the bankruptcy occurred.

Public officials and underwriters (most of whom are highly ethical, professional individuals) and the taxpayers that support them would benefit from institutional investor oversight. *The Wall Street Journal* recently speculated that the goal of the SEC arbitrage abuse investigations was to bring the municipal industry “closer to the standards of other U.S. capital markets” (cited in Beckett 1997). Allowing state and local governments to enter those markets is the direct route to achieving that noteworthy goal.

## **Defer red Maintenance**

One practice over which institutional investors might exercise oversight if they could purchase infrastructure bonds is deferred maintenance. Some governors and mayors freely admit they “raid” the maintenance budgets, transferring the funds to more visible projects. Roads are eventually fixed, but only through major reconstruction, costing the taxpayers far more than ordinary maintenance.

Institutional investors, especially local pension funds, might well insist on proper maintenance, first, to protect their investment and, second, as a service to their communities. They could insist on maintenance covenants, such as those included in bonds for some toll roads and bridges in this country and in Europe.<sup>11</sup> A maintenance covenant is a simple contract between a state or local government and the purchaser of its bonds stating that the government will adhere to routine maintenance schedules established by engineers or architects. Some covenants also require annual public reports on adherence. These covenants are easily drafted and enforced; if a covenant is breached, the bank trustee has the authority to enforce the adherence, for example, by seeking a court decree.

## **A Solution: The AGIS Bond**

While the tax exemption of municipal bonds allows the needed subsidy to get to state and local governments, it suffers from controversy, problems, abuses, and only partially successful attempts at restricting the damage through legislation and federal regulation. State and local governments have always opposed any major alteration of this much needed subsidy process. Their opposition is understandable in view of the alternatives that have been proposed in the past (see Appendix B), most of which would have made the subsidy subject to the vicissitudes of federal policy and budgeting and therefore subject to eventual elimination.

The AGIS bond is a promising approach to more efficient operation of the municipal bond market.<sup>12</sup> The idea is to create a taxable bond for sale in the regular capital markets, but one that contains a special tax-exempt benefit that can be “stripped” from the bond and sold separately to investors who are interested in tax sheltering but do not wish

to buy a long-term municipal bond or interests in a municipal bond mutual fund.

There is some precedent for the AGIS bond; for example, the low-income housing tax credit is sold in a similar manner. In effect, the state or local government offers for sale both a taxable bond and associated tax benefits. The purchasers of the tax benefits, who would presumably be looking for ways to lower their taxes, would receive an annual exclusion from gross income equal to what would otherwise be the tax-exempt interest on the bond and would pay a price based on the after-tax present value of a stream of future annual exclusions. They would apply against their annual taxable income an amount equal to the associated tax benefits. Municipalities would use the money they receive from the sale of the tax benefits to reduce the principal amount of bonds required to be issued to finance the desired level of capital expenditures.

The AGIS market would not supplant the tax-exempt market; the tax-exempt market would remain as an alternative and a check on the efficiency of the new process. Presumably, most state and local governments would ultimately recognize that it is in their interest to offer AGIS bonds rather than tax-exempt bonds because the issuer of AGIS bonds retains the full value of the federal subsidy instead of paying out approximately a third to wealthy bond purchasers. As a result of the stripped tax benefit, the effective interest rate to the issuer would be reduced, compared to current municipal rates, and the federal subsidy would thus approach or equal the federal tax revenue loss.

How does the AGIS bond eliminate the inefficiency associated with the tax-exempt municipal bond? By separating the two components of the municipal bond—tax exclusion and a fixed-income government security—the AGIS bond is competitive in two separate markets. Instead of trying to accommodate the much more limited group of investors that seek both components together, the AGIS bond sells a tax exclusion to people seeking a tax shelter and sells the cash flow to those seeking interest (and principal repayment) income through long-term fixed-rate securities.

Recall that the reason for the inefficiency of tax-exempt bonds is the insufficient number of buyers in the highest tax brackets to purchase all

the municipal bonds available for sale. Taxpayers in the highest brackets might want the tax exclusion but often do not want to tie up their funds in fixed-income securities or an equivalent bond fund. As a result, the interest rates offered on tax-exempt municipal bonds must rise to attract lower-bracket investors. With the AGIS bond, that is no longer the case.

Decoupling the two components of the municipal bond also opens up the municipal bond market to a universe of interest-income seekers, not just U.S. pension funds and banks but foreign pension funds and global investors, who might well be interested in stable U.S. securities backed by state and local governments. Competitive bidding among these numerous investors could lower interest rate costs even further to the issuing governments and their taxpayers.

How are the major players likely to react to this approach? State and local governments should be expected, upon successful completion of pilot

**Box 3 An AGIS Bond Issue**

How would an AGIS bond issue work in practice? Suppose the State of New York wished to raise \$100 million through a 30-year bond issued at a tax-exempt rate of 5.9 percent (an average market tax-exempt rate). That would provide purchasers with \$5.9 million interest that is exempt from federal taxes annually. Now suppose the state offers a 30-year AGIS bond. Think of the AGIS bond as having two “coupons,” which go to two separate groups of investors. Investors seeking tax shelters pay roughly \$21 million for the tax-benefit coupons, which yield a stream of \$5.9 million annually in the form of exclusion from income over the next 30 years. Investors seeking interest income pay roughly \$79 million for the cash-flow coupons, sold at discount from the \$100 million face value because the actual interest on these bonds is taxable.

The State of New York would receive the full \$100 million payment, at an effective payable interest rate *lower* than 5.9 percent because the tax benefit would be bid down to an efficient level—the benefit to the highest marginal rate taxpayer. The exact price to the investors and the exact interest rate would be determined by underwriters in an iterative, computer-assisted process and would depend, among other things, on market interest rate levels and the spread between taxable and tax-exempt rates at the time.

programs, to favor this approach since it reduces their costs or, at least, leaves them no worse off than the tax-exempt market. Municipalities retain the federal subsidy, they obtain the full subsidy instead of the current partial subsidy, and they retain full control over decisions related to the bond issuance. Meanwhile, the tax-exempt market is left intact and serves to make sure that investors seeking the tax exclusion are offering a fair price for AGIS bonds.

Also, with the implementation of a stripped tax benefit, state governments and those local governments that have an income tax might be expected to begin taxing the interest on their own municipal bonds.<sup>13</sup> This would make their borrowings consistent with the national level, generate additional income for them, and ensure that in-state public pension plans could invest in their bonds.

At the federal level, reactions might be mixed. The Treasury is generally hesitant to create additional forms of tax benefits. However, unlike other tax-benefit transfers, the AGIS proposal would reduce or eliminate windfall gains, thus improving the efficiency and equity of the existing system. It will allow more infrastructure construction with the same subsidy. Moreover, it would not substitute a direct cash subsidy, which might have an impact on the budget appropriation process. On the other hand, there may be some concern in Congress that the AGIS bond would encourage even more bond issuance (a laudable outcome if it results in beneficial infrastructure investment), thereby raising costs to the federal government.

Among the public, there may be some concern about the symbolism of a new tax-exclusion security marketed to high-bracket taxpayers. The fact is, though, that the highest tax brackets are *already* reaping a windfall; with the AGIS approach, they would at least be paying for the benefits they currently receive gratis. The real beneficiaries of the AGIS bond are the ordinary taxpayers who have been transferring approximately a third of the subsidy into the pockets of the wealthy.

Within the bond market, large investment houses are likely to approve of the AGIS. However, smaller ones, especially small regional securities firms, might find that it runs counter to their financial interest in maintaining the municipal bond market as an isolated, domestic market.

The standard capital markets in this country are deep and liquid, with tens of millions of dollars of taxable bonds traded every day. Yet concerns about the size and liquidity of the municipal segment of that market are legitimate. In the first few years that state and local governments issue taxable bonds, will potential buyers be reluctant to bid, fearing that if they wished to trade, the market might be too “thin” to respond quickly at realistic prices?

Several factors militate against this. Approximately 50 percent of new bond issues are enhanced by municipal bond insurance, creating, in effect, an easily understood AAA credit (*The Bond Buyer* 1997a); this should considerably ease even a major influx of taxable municipal bonds into the market. Enough taxable municipal bonds have already been issued, for a variety of reasons, to create what appears to be a reasonably vibrant alternative market. As of September 1997, \$46 billion in taxable municipal bonds were outstanding in the market and eligible to be traded.<sup>14</sup> In June 1997, the State of New Jersey brought the largest taxable municipal bond issue ever offered to the market. The \$2.8 billion issue was snapped up and enthusiasm for the bonds was so strong that the state was able to offer a lower interest rate than it had planned (Pulley 1997). There is thus little doubt that a major and fully efficient taxable municipal bond market could bloom, even as the tax-exempt municipal bond market continued to exist.

## **Conclusion**

This paper does not argue against favorable tax treatment of municipal bonds, only against the current form of the exemption. The AGIS bond proposal would work more efficiently and equitably. It would:

- Open the heretofore isolated and exclusively domestic municipal bond market to a large array of domestic and foreign individual and institutional investors in the regular domestic and global capital markets
- Increase the number of bidders and thereby produce a more competitive market for municipal securities, which is likely to reduce interest rates, bringing down government costs for infrastructure

- Create institutional investor and capital market oversight of the issuing governments and municipal bond offerings
- Assure that the full federal subsidy goes to state and local governments, instead of a third of it being siphoned off by wealthy taxpayers
- Allow municipalities (state and local executives and legislatures) to retain full control over the timing and costs of bond offerings

With the emergence of large pension funds, entry of private firms into infrastructure financing, and several municipal bond scandals, the arguments against the current form of tax exemption of municipal bonds have never been so strong; with the Supreme Court's finding against its constitutional protection, the legal argument for maintaining it has never been so weak. Federal legislation to allow a test of AGIS bonds would begin to tackle a long-standing inefficiency in the municipal bond market and move that market in a healthy direction.

### **Appendix A: Inefficiency of Tax-Exempt Municipal Bonds**

Most of the inefficiency and inequity associated with the tax exemption relates to individual investors and their proxies, who hold the bulk of municipal bonds. The tax effects on institutional investors would require a more complicated analysis of the tax shifting of the burden of paying taxes between the institutions involved and their customers and is not analyzed here. (An additional source of distributional inequity is at the community, rather than the individual investor, level. Communities with more affluent citizens are more likely to demand higher levels of public services; their higher levels of borrowing are subsidized by all taxpayers.<sup>15</sup>)

The inefficiency and inequity can be expressed in economic terms in the formula used by Mussa and Kormendi (1979):

$$W = T - S = (t - t^m) \cdot i^c \cdot M$$

where

$W$  = total windfall gain to holders of tax-exempt municipal bonds

$T$  = total tax loss to the Treasury because of the exemption

$S$  = total reduction in borrowing costs enjoyed by state and local governments as a result of the exemption

$t$  = average marginal tax rate of municipal bondholders

$t^m$  =  $(i^c - i^m)/i^c$  = implicit tax rate on tax-exempt municipal bonds

$i^c$  = nominal yield on taxable corporate bonds

$i^m$  = nominal yield on tax-exempt municipal bonds

$M$  = dollar value of the outstanding stock of tax-exempt municipal bonds

According to Mussa and Kormendi, however, this standard analysis is flawed because it assumes a zero rate of inflation. In fact, the inefficiency is smaller at any positive rate of inflation because the real effective tax rate paid by bondholders increases as the inflation rate increases. Thus, the proper formula should read:

$$W^{He} = (He - t^m) \cdot r^c \cdot M^H$$

where

$W^{He}$  = true measure of windfall gain to holders of tax-exempt municipal bonds

$He$  = effective real tax rate of municipal bondholders

$t^m$  = real implicit tax rate paid by municipal bondholders

$r^c$  = real yield on taxable corporate bonds

$M^H$  = real value of outstanding stock of tax-exempt municipal bonds

Writing in 1979, when inflation averaged 6 percent annually, Mussa and Kormendi found that while the nominal implicit tax rate on municipal bondholders averaged about 30 percent, the real effective tax rate averaged over 70 percent, nullifying any possibility of a tax inequity. Inflation rates in the 1990s, however, are substantially lower than in the late 1970s.

A key factor in estimating the inefficiency of the exemption is estimating the average marginal tax rate of municipal bondholders. Analysts in the 1960s and 1970s applied a rate of 42 percent in their calculations; Mussa and Kormendi estimated a lower rate, 36 percent, because of the availability of alternative tax shelters to which bondholders could shift their money if tax-exempt bonds were not available. Reflecting a tax



rate structure closer to the contemporary one, Feenberg and Poterba (1991) estimated a weighted average marginal tax rate of 28.7 percent on household holdings of tax-exempt debt.

These formulas are necessarily a simplification of the true situation because the value of tax-exempt bonds is determined not only by the federal tax rate but by state and local personal income tax, capital gains tax, and intangible property tax policies. The value of the tax exemption has declined over the years as the tax rate schedule has been compressed. In general, the larger the spread between taxable and tax-exempt interest rates, the smaller the inefficiency of the tax concession.

## **Appendix B: A Short History of Municipal Bonds and Attempts to Eliminate Their Tax Exemption**

### **Intergovernmental Tax Immunity**

Since the early 1800s, states and localities have issued bonds to finance capital improvements made necessary by continued population growth and urbanization. Following the financial collapse of 1837 and a series of state defaults in the 1840s, many states adopted constitutional restrictions on the amount and purpose of state, and later local, government borrowing.

Tax exemption was based on the federal constitutional doctrine of intergovernmental tax immunity. During the nineteenth century limits on the ability of the federal government to impose taxes that interfered with the borrowing power of states were established in a series of Supreme Court decisions (Zimmerman 1991, 41–43). In *Collector v. Day*,<sup>16</sup> the Court held that the federal government could not subject the salaries of state judicial officers to the income tax first enacted in 1861. The strongest statement of tax immunity came following reenactment of the income tax in 1894, which was quickly challenged and judged unconstitutional in *Pollock v. Farmers' Loan Trust Co.*<sup>17</sup> Although the primary issue was apportionment of the tax among the states, the Court found the federal income tax unconstitutional also because it would tax interest on state and local debt: “The tax in question is a tax on the

power of the States and their instrumentalities to borrow money, and consequently repugnant to the Constitution.”

In 1913 the Sixteenth Amendment was ratified, removing the barrier to federal income taxation caused by the apportionment clause. Although the amendment gave the federal government the power to tax income “from whatever source derived,” there was an implicit understanding that interest on state and local obligations would not be taxed. The exemption of interest on state and local bonds was stated explicitly in the income tax legislation of 1913.

Nevertheless, the validity and wisdom of the tax exemption was questioned by federal officials. In 1921 Treasury Secretary Andrew Mellon wrote quite colorfully that the “existence of this mass of exempt securities constitutes an economic evil of the first magnitude” and called for elimination of the tax exemption, a call echoed in 1938 by President Franklin D. Roosevelt in a message to Congress (Zimmerman 1991, 43). In 1923 the House of Representatives passed a constitutional amendment to authorize the taxation of income derived from future issues of municipal securities, but the Senate voted against it. In the history of Congressional action on this issue,

Virtually every Secretary of the Treasury . . . has favored removing the exemption feature. Public finance experts have repeatedly attacked it, and volumes of testimony before congressional tax committees have been heard in connection with its repeal. Despite this rather concerted opposition, Congress has some six times defeated proposals to remove the exemption, and on many more occasions such proposals have never reached a vote. (Ott and Meltzer 1980, cited in American Enterprise Institute 1973<sup>18</sup>)

In 1988 there was a dramatic shift in the legal climate when the Supreme Court in *South Carolina v. Baker* effectively limited the federal government’s ability to place restrictions on tax exemption, such as the restrictions embodied in the Tax Equity and Fiscal Responsibility Act of 1982. The decision then went further and made it clear that “The owners of state bonds have no constitutional entitlement not to pay taxes on income they earn from the bonds, and States have no constitutional entitlement to issue bonds paying lower interest rates than other issuers.”<sup>19</sup>

This decision eliminated the constitutional protection for municipal securities. In reaction, several state legislatures passed resolutions calling on Congress to voluntarily restrict its own powers to collect taxes on state and local securities.

### **Taxable Bond Option (TBO)**

Since the 1930s the concept of a taxable bond option (TBO) has been advanced as a way to eliminate the inefficiency of the federal tax-exemption of municipal bonds while retaining federal reimbursement of state and local governments for the loss of the tax exemption. Under most of the proposals, the federal government would give to the municipalities that portion of the tax-exempt subsidy they would normally get, but would keep the portion of it (about 35 percent) that has been flowing to high-bracket taxpayers. Some TBO proposals would require taxable bond financing by state and local governments; others would allow them to chose between taxable and tax-exempt bonds. TBO proposals since the 1960s include the following (American Enterprise Institute 1973):

- Sen. William Proxmire (D-Wis.) introduced a bill in 1968 that would have created a nonprofit corporation to provide a federal guarantee for taxable municipal bonds and authorized subsidies of up to a third of the interest charges on those bonds.
- The Johnson administration introduced a bill in 1968 that would have given states and localities an incentive to issue only taxable bonds for water pollution control facilities by committing the federal government to provide an interest subsidy of up to 25 percent on such bonds.
- Under pressure of tax reform hearings held by the House Ways and Means Committee in 1969, the National Governors Conference developed a “dual coupon” proposal. The federal government would pay a percentage (say, 50 percent) of the interest costs of taxable bonds to be issued by state and local governments. Each taxable bond would bear two coupons; one coupon payable by the U.S. Treasury and the other coupon payable by the issuer of the bond. (In this proposal, unlike other taxable bond options, the bondholders essentially determine the timing of the federal interest payments by deciding when to redeem the coupons.)

- In 1970 Congress took action on three bills authorizing federal subsidies for certain municipal projects, such as rural water and sewer facilities, if the projects were financed with taxable municipal bonds.
- Several bills were introduced in 1972 and 1973 that would have provided a flexible subsidy of 40 to 50 percent if state and local governments issued taxable bonds.
- The House Ways and Means Committee reported a bill in 1976 that proposed a 35 percent interest subsidy on taxable municipal bonds (Connor 1994).

Why did all of these proposals fail to pass? The primary reason was opposition by state and local governments, who feared that a taxable bond option would be the first step toward eliminating tax-exempt bonds entirely. Direct federal subsidies of taxable municipal bonds would be a temporary measure that could be rescinded some years down the road. Furthermore, even if such subsidies continued, municipal officials did not want to see their federal subsidies tied to the federal budget process.

We might also speculate that there was little impetus to pass the TBOs or other alternative means to finance infrastructure because the problems with tax exemption discussed in this paper had not yet developed. Pension funds were small and not considered as potential significant purchasers of municipal bonds; devolution of government activities to the private sector was hardly conceptualized, much less practiced; and there had been no municipal bond scandals of sufficient scope to produce a call for institutional investor oversight.

### **Other Alternatives to Tax Exemption of Municipal Bonds**

The TBO is not the only suggested approach to eliminating the problems associated with tax exemption. In 1994 Rep. Richard Gephardt (D–Mo.) and Rep. Rosa DeLauro (D–Conn.) introduced a bill that incorporated the recommendations of the 1993 Commission to Promote Investment in America’s Infrastructure. The bill would create two types of “public-benefit” bonds: type A bonds to cover transportation and environmental infrastructure facilities that are currently tax exempt and type B bonds to cover public-purpose infrastructure facilities, whether privately or publicly owned. The idea was to retain and extend the tax

exemption for all public-purpose infrastructure, regardless of ownership, thus stimulating private sector activity in developing, modernizing, and purchasing infrastructure facilities.

The Gephardt-DeLauro bill would allow defined-contribution pension plans invested in mutual funds to purchase public-benefit bonds and would allow retirees to exclude from taxation the interest income received on those bonds (“Administration Weighs Taxable Bond Plan” 1994). As a result, public-benefit bonds would bear interest rates comparable to those of current tax-exempt municipal bonds (Poole 1995). Simultaneously, this proposal would make investment in infrastructure attractive to pension funds.

Another approach, offered by Robert Poole of the Reason Foundation, is to level the playing field between private and public ownership by removing the tax exemption for infrastructure facilities that are essentially self-supporting business enterprises, whatever their ownership (Poole 1995). This class of “business infrastructure” would include airports, energy facilities, electric and gas utilities, environmental facilities, highways, bridges, tunnels, ports, solid waste facilities, transportation facilities, and water and wastewater treatment facilities.

Poole’s elimination of the tax exemption would apply only to those municipal bonds that are specifically designated as infrastructure revenue bonds (about a third of all tax-exempt bonds, or approximately \$50 billion, annually). Poole notes that state and local governments might even be able to reduce interest rates on the remaining new issues of municipal bonds as a result of the increased demand and their reduced supply. Lower interest payments, in turn, could offset the increase in interest these governments would pay on infrastructure bonds. Federal taxpayers would save through fewer tax-exempt bonds and thus the reduced transfer of benefits to wealthy taxpayers. In addition to the positive effects on federal tax revenues, this approach removes barriers to infrastructure privatization.

The Public Finance and Infrastructure Investment Act, which would have established a new type of tax-exempt private-activity bond, was introduced in Congress in 1993 but did not pass. The Clinton administration reportedly considered including in its FY 1996 budget a plan to let state and local governments issue taxable bonds subsidized by the federal

government through direct payments to states and localities (“Administration Weighs Taxable Bond Plan” 1994). Proposals decades ago had sought to achieve the same goal (Rabinowitz 1969). The Selzer plan in 1941 called for the federal government to pay a fixed proportion of the annual interest payments of local governments. A Treasury Department committee suggested in 1943 that the Treasury redistribute to states and localities the revenue collected from taxing new municipal bond issues. A suggestion was made in 1944 that an Intergovernmental Loan Corporation be established with a revolving fund to lend to local governments at the federal borrowing rate plus a service charge. The Lyle-Fitch tax credit proposal in 1950 involved a tax credit that would equalize the after-tax yield on corporate and taxable municipal bonds, allowing municipal bonds to sell at lower before-tax yields than corporates.

In the 1997 debates over the reauthorization of ISTEA (Intermodal Surface Transportation Efficiency Act), Congress considered a \$10 billion federal program of loan guarantees and lines of credit designed to leverage infrastructure investment by states, cities, and industry. The program was amended by Sen. John Chafee (R-R.I.) to exclude tax-exempt municipal bonds from the program because of the additional costs to the Treasury (Stanton 1997a).

### **Abuses and Restrictions: Arbitrage and Private-Activity Bonds**

Although Congress did not pass any of the proposals to eliminate tax exemption, a series of abuses in the 1960s and 1970s led federal legislators to enact restrictions on the issuance of tax-exempt municipal debt. Beginning in 1968, Congress sought to curb abuses stemming from two sources: arbitrage activities and private-activity bonds.

The arbitrage restrictions in the 1986 Tax Reform Act were intended to stop the practice by municipalities of investing the proceeds of tax-exempt bonds not in public works construction but in higher-yielding corporate or Treasury bonds. A municipality would issue tax-exempt bonds for a construction project that would be purposely delayed for months or even years and in many cases eventually canceled. If the project was canceled, the municipality would, of course, refund the bonds, but in the meantime it would have earned the arbitrage, that is, the difference in

interest rates between the two types of bonds (Apogee Research, Inc. 1993, 32). Some colleges and universities with substantial endowment funds also engaged in arbitrage, financing their capital needs with endowment funds and investing their subsidized tax-exempt bonds to earn taxable yields (Davie 1996, 3). This practice amounted to a grant from all federal taxpayers to a municipality (or other institution) that manipulated the market. Under the restricted rules, issuers must rebate to the federal government any arbitrage profits they earn or restrict the investment yield on the proceeds of the bonds to the yield on the bonds.

The most widely reported abuses of tax-exempt financing have come in the area of industrial revenue bonds (IRBs) and industrial development bonds (IDBs) and their use to finance projects intended primarily for the benefit and profit of the private sector. Approximately a third of outstanding municipal debt<sup>20</sup> consists of bonds that have been issued for private-activity projects, including such things as pollution control, sewage and waste disposal facilities, student loans, low-income housing, airports, docks, and sports and convention facilities. Some of these projects have broad-based social and civic value; others are special interest carve-outs. Some, such as student loan bonds and mortgage revenue bonds, fall in the middle.

Because of the way the laws were written, corporations with a large number of geographically dispersed facilities, such as retail and fast-food chains, could make good use of IRBs and IDBs. McDonald's, for example, financed 32 new restaurants in Pennsylvania and Ohio in 1979; K-Mart used \$220.5 million of IRBs to open 96 stores in 19 states between 1975 and 1980 (Congressional Budget Office 1981, 23); and by 1983 Wal-Mart had been issued over \$100 million in tax-exempt bonds ("Bond Lobbyists March Again" 1983).

The uses and abuses of private-activity bonds were largely halted by the Tax Reform Act of 1986. However, circumventing the private-activity restrictions is still eminently possible, as shown by the continued abuse of tax-exempt financing for building sports stadiums. A study of stadium financing by the Congressional Research Service estimated that on a hypothetical \$225 million stadium price tag (comparable to stadiums being built in the 1990s in Chicago, Denver, Cleveland, and Milwaukee),

financed entirely with 30-year tax-exempt bonds, the loss to the Treasury ranges from \$47.1 million to \$94.2 million, depending on interest rates (Zimmerman 1996, 9–10). In 1997 Senator Daniel P. Moynihan (D–N.Y.) proposed banning the use of tax-exempt bonds for stadium financing. His proposal was denounced by the U.S. Conference of Mayors as a dangerous precedent for federal intrusion into state and local financing (Marois 1997).

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## Notes

1. This paper uses the standard terminology by which *municipal bonds* and the *municipal bond market* (muni bonds and market) refer to the financing of state and local governments and their agencies and authorities and of other facilities such as public hospitals and universities. *Municipalities* may be used as a collective term referring to the municipal bond issuers.
2. 485 U.S. 505, 1357 (1988). See Appendix B for a brief history of municipal securities.
3. Comparison of Revenue Bond Index to 30-year Treasury Bonds from January 1990 to January 1997, courtesy of J.P. Morgan.
4. For example, David Aschauer (1997) found that “for most of the United States during the 1970s and 1980s, the actual levels of public capital were below the levels which would have maximized the rate of productivity growth.” Robert Krol (1997), citing a study by Morrison and Schwartz, notes that “once the marginal cost of raising public capital funds is taken into account, the net social benefits from additional public capital in the United States is close to zero.”



5. A recent estimate by the Joint Committee on Taxation puts the total federal revenue loss from 1998 to 2002 at \$140 billion due to the tax exemption of municipal bonds. See Stanton (1997b).
6. Calculated as the simple average of rates on 30-year Treasury bonds and 30-year AAA bonds.
7. Among the 3 million individuals who reported receiving tax-exempt interest in 1994, 71 percent had an adjusted gross income of \$50,000 or over, and 15 percent reported an adjusted gross income of \$200,000 or over (Internal Revenue Service 1996, Table 2.1). The data report receipt of tax-exempt interest.
8. Based on data from the following sources: Allmanna Pensionsfonden, 1995 *Annual Report*; Marcel Fleugels, Public Affairs Department, Algemeen Burgerlijk Pensioenfonds, private conversation, February 7, 1996; Tomoko Fujii, Tokyo Economic and Market Analysis, Salomon Brother Asia Limited, memo, August 21, 1995; David Gibson, Ontario Teachers Pension Plan, private conversation, March 14, 1996; David Gye, Morgan Stanley, memo to Sir David Walker, "Tax-exempt Bonds," January 3, 1996.
9. Paul Williams, vice-president of research and investment strategies at John Nuveen & Co. believes that state pension funds could ultimately account for 25 to 40 percent of the municipal market (reported in Heap 1995).
10. According to the Public Securities Association, between 1980 and 1991 the municipal bond market had an average annual default rate of 0.4 percent, compared to 5.5 percent in the corporate bond market. A report by J.J. Kenny Co. found that between 1980 and 1991 only 53 municipal bond issues defaulted out of 69,656 that were rated (cited in "Muni Bonds' Best Bet" 1994, H1).
11. One example in the United States is the 1993 trust agreement, *Massachusetts Turnpike Authority and Shawmut Bank, N.A., as Trustee*, March 1.
12. I am indebted to Messrs Imhoff, Mayer, Harper, and Piemont for this section.
13. All states except the District of Columbia already tax out-of-state municipal bonds.
14. Data from Muniview Municipal Database provided by Christian Anthony, J.P. Morgan Securities, Inc., September 1997.
15. Metcalf (1991) points out that it is not the case that higher income communities reap greater benefits from tax exemption because they tend to have higher credit ratings and thus lower borrowing rates.
16. 11 Wall. 113 (1871).
17. 157 US 492 (1895).
18. Ott and Meltzer (1980) cite an article by Lucille Deick (1946) that lists 114 resolutions introduced between 1920 and 1943 to reduce the subsidy.
19. 485 US 505, 1357 (1988).
20. Based on 1992-93 Census of Governments data cited in Davie (1996, Table 2).

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