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# A THERMOMETER FOR THE TAX SYSTEM: THE OVERALL HEALTH OF THE TAX SYSTEM AS MEASURED BY IMPLICIT TAX

*Calvin H. Johnson**

THE overall health of the income tax system can be fairly measured from public market data by looking at the "discount" or "implicit tax" reflected in municipal bonds. A taxpayer may avoid tax on capital income, quite legally, by purchasing municipal bonds, because § 103 of the Internal Revenue Code makes the interest income from state and local government bonds exempt from tax.[1] Issuers of the bonds reduce the interest rate on the bonds, relying on the fact that investors do not have to pay tax on the interest. "Implicit tax" is the amount by which the pretax interest rate offered on tax-exempt municipal bonds is lower than taxable interest rates. More generally, "implicit tax" is the drop in the pretax return that arises on any tax-advantaged transaction.[2] The implicit tax reflects the price the taxpayer is willing to pay, and needs to pay, in order to avoid income tax.

The implicit tax is now giving a signal that the tax system is not well. The implicit tax has been dropping in recent years, and is modest under current conditions, lower at times than the lowest statutory tax bracket of 10%.[3] It is not all that expensive to buy your way out of federal income tax these days.

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1. I.R.C. § 103 (2003).

2. The term "implicit tax" is conventional, but it is in some senses a terribly misleading name. The implicit tax does not provide any revenue for the federal government to pay for the Marines or other government programs. The implicit tax is often an unintended and entirely harmful result. There is an implicit tax on business meals, for example, a pretax drop in value caused by the tax benefits, under which consumers tolerate waste in getting less than full value out of the meal. Taxpayers ordinarily must pay tax on money used to buy meals and if the business meal is not taxed, they tolerate waste, so long as the waste is less than the tax they have avoided. The implicit tax on houses drives down the acceptable return and drives up the price of homes so as to exclude new buyers or buyers from lower tax brackets. The implicit tax does, however, hurt the investor, which is undoubtedly the reason for the name.

3. I.R.C. § 1(i)(1) (2002), as amended by Economic Growth and Tax Relief Reconciliation Act of 2001, Pub. L. No. 107-16, § 101(a), 115 Stat. 38 (2001) (applicable to tax years starting 2001 or after).

The modesty of the implicit tax means that only a small fraction of the federal cost of tax exemption is getting delivered on-site to the intended state and local beneficiaries. The implicit tax represents the only public return from the exemption system, in the form of cheaper costs for states and localities. The rest of the cost of the exemption is lost in terms of the purpose of the exemption, a cost without any delivered benefit. Given the modesty of the implicit tax, most of the federal cost is lost to waste, and only a decreasing fraction of the cost is delivered. It would be considerably cheaper and more efficient to pay the intended beneficiary directly with federal cash.

The modesty of the implicit tax gives signals about the state of the tax system beyond municipal bonds. First, implicit tax is set by supply of tax advantages of many kinds. The low level of the implicit tax tells us that the supply of tax advantages is swamping the demand. There are too many cheap opportunities for taxpayers to avoid tax, including by means beyond buying municipal bonds. The guardians protecting the tax base are too weak.

Implicit tax on municipal bonds also sets limits on how efficient the tax system can be as a delivery vehicle for subsidies other than bonds. Investments compete with each other and investors move capital fluidly across the border of one investment and into another to maximize the after-tax return. The high after-tax return on tax exempts will require other competing investments to give high after-tax returns, which sets the limits on how much subsidy the competing investments can deliver and how efficient they can be in delivery of the federal subsidy.

The major advantage of looking to the implicit tax on municipal bonds instead of other tax-advantaged transactions is that the implicit tax on municipal bonds can be measured from publicly available market data and the market credit rating systems. The implicit tax on private investments, not traded on broad markets with published interest rate data, is harder to identify.

A tax system with an implicit tax lower than the maximum statutory tax rate is not a healthy tax system. Using the tax system to give subsidies or incentives under such conditions is inefficient, even immoral. Paying directly with dollars is cheaper and more efficient.

When the implicit tax is low, Congress cannot collect its taxes from the sources it has identified as the best, least harmful bearers of tax. The best sources, however identified, slip out of the tax base and suffer the implicit tax instead; Congress must then rely on alternative and inferior sources. Under current conditions it is much cheaper to suffer the implicit tax on municipal bonds than to pay tax in the higher tax brackets.

The modesty of the implicit tax implies that we need to be giving more attention to defending the tax base. Tax bases tend to erode over time. An army of well-trained, smart, highly motivated tax planners spend their professional lives creating and exploiting ways to avoid tax, and over time

the professionals succeed. Empires fall because their tax bases erode.[4] The modesty of the implicit tax indicates that we are pretty far along in losing our tax base.

### A. Five on the Island: A Simple Model of the Implicit Tax

If the supply of tax-advantaged investments were limited to the amount that could be purchased by the highest bracket taxpayers, then the tax exemption of § 103 could be an efficient vehicle for delivery of a federal subsidy and could impose the appropriate burden on the best sources of tax. Assume a simple model in which there is a small island consisting of five taxpayers, each of whom has $100,000 to invest and each with a different tax bracket. All models are wrong, of course, but some are interesting.[5] In this model, Max faces a 40% tax rate, Middle faces a 30% tax rate, Moderate faces a 20% tax rate, Minny faces a 10% tax rate, and Nils faces a 0% tax rate. Max, at 40%, pays very close to what is in fact the maximum statutory tax rates under current federal tax law.[6] Assume prevailing interest rates on taxable bonds are 10%, so absent the exemption, interest paid to bond purchasers would be $10,000, as a rent-like annual payment. The 10% is used here because it makes the math more transparent and not because it represents current interest rates. Each investor

4. *See, e.g.*, Paul Kennedy, The Rise and Fall of the Great Powers 53 (1987) (Spain relied on taxes only within Aragon to support its empire and even there the aristocracy was willing to raise taxes only because they did not pay them.); Gail Bassenger, *Taxes*, A Critical Dictionary of the French Revolution 582-83 (Francois Furet & Mona Ozoup eds., 1993) (concluding that the French *ancien regime* fell because it used a tax system so riddled with exemptions, privileges and *libertés* that it could not reach the wealth of a prosperous country to solve the financial bankruptcy of the monarchy).

5. Attributed to George Box of the University of Wisconsin, Madison, *at* http://aris.ss.uci.edu/econ/personnel/kawa/aphorism.html (last visited Feb. 3, 2003).

6. The highest tax rate paid by a significant volume of taxpayers is now 39.8%, computed as follows: I.R.C. § 1(i)(2) provides for tax brackets up to 38.6% for 2002-2003. Another 1.2% is added by the itemized-deduction phaseout of I.R.C. § 68. Section 68 works by taking away 3 cents of most itemized deductions for every dollar of extra income over a level now set at $137,300. Rev. Proc. 2001-52, 2001-59 I.R.B. 623. When 3 cents more income is subjected to a 38.6% bracket income, the effect is like 3% x 38.6% or a 1.2% surtax. On the face of the statute, § 68 tax disappears once 80% of a taxpayer's itemized deductions have been absorbed, but in practice, taxpayers increase the targeted itemized deductions as their income increases, so that only trivial tax is avoided by the full phase-out of the deductions. Hence in practice, § 68 acts just like an extra 1.2% tax on extra income. *See* Calvin H. Johnson, *Simplification: Replacement of the Section 68 Limitation on Itemized Deductions*, 78 Tax Notes 89, 91 (1998).

There is another phase-out tax targeting personal exemptions in § 151(d)(3), which generates a surtax of about 0.5% per exemption. The § 151(d)(3) phase-out ends at $328,000 for married couples, however, not far above the point where the 36% bracket becomes the 38.6% bracket ($307,050), and so the 0.5% surtaxes can contribute to a tax rate of 39.8% or higher, only with eight or more dependents, that is, only rarely.

There are also other ceilings for benefits that produce extra tax as income rises, *see, e.g.*, I.R.C. § 469(i) (2002) (phase out of exemption for passive activities), but they seem not to create a clientele large enough to affect the market or are not predictable enough to act as a maximum tax rate for an investor. In most cases, moreover, the other ceilings were not intended by Congress to be in the nature of an increase in a marginal tax rate that is appropriately preserved. In any event, ceilings other than § 68 are not taken into account in the 39.8% tax rate.

on the island would receive a different after-tax amount from the fair-market value interest of $10,000 per year, as shown by Table 1:

| Table 1. Island Economy of 5 Investors with Different Rate Rates | | | | | |
|---|---|---|---|---|---|
| | Max | Middle | Moderate | Minny | Nils |
| Federal tax rate | 40% | 30% | 20% | 10% | 0% |
| Taxable Interest | $10,000 | $10,000 | $10,000 | $10,000 | $10,000 |
| Tax | $ 4,000 | $ 3,000 | $ 2,000 | $ 1,000 | $ 0 |
| After tax interest | $ 6,000 | $ 7,000 | $ 8,000 | $ 9,000 | $10,000 |

Assume an issuer, City, wants to borrow $100,000 from the island, and its bonds give interest exempt from tax. If City's bonds were the only tax-advantaged investment available to this island economy, then City could borrow from Max alone and pay just a hair over $6,000 per year. Max gets only 6% interest after tax from the taxable alternative investments. Giving him $6,000 of tax-exempt interest marks the border, the line of indifference, for Max between taxable and tax-exempt bonds.

If City pays just $6,000 interest on the bond, then Max will get no windfall or unfairness in avoiding tax. The implicit tax on City's municipal bonds would be $4,000, that is, the difference between $10,000 from taxable sources and the $6,000 from the tax-exempt bond. The implicit tax rate would be the $4,000 implicit tax as a percentage of the $10,000 pretax amount on taxable bonds, or 40%, the same as the statutory tax rate Max faces. Max's after-tax position—$6000—will be the same whether he invests in tax-exempt or taxable bonds.

When the implicit tax reaches the highest tax rate, moreover, the tax exemption works as a subsidy to City, with the delivery efficiency of a government check.[7] Exemption of Max costs the federal government $4,000 in the form of lost revenue, but the issuer, City, gains $4,000 in the form of saved cost. Both the federal cost and City's benefit are measured by comparison with the same counter-factual $10,000, that is, that City will have to borrow with, and Max will have to invest in, taxable bonds paying the 10% interest rates if the tax-exempt bonds were not available.[8]

7. The statement in text ignores the higher transaction costs for municipal bonds than for a government check. If there are no auditing or screening controls, the government check costs 37 cents plus the nominal cost of machine check writing. For municipal bonds, however, underwriters and rating companies take out a portion of the bond proceeds and every investor incurs costs of investment advice and the transaction costs of actual purchase.

8. The assumption that the federal government will collect $4,000 if City does not sell tax-exempt bonds to Max, depends upon how incremental or how radical the change is that ends Max's tax-exempt investment. If Max has many other opportunities to avoid tax, other than this particular $100,000 tax-exempt bond, then the federal government will not collect $4,000, or anything, if the City bond is not issued. If the federal government, however, shuts down all tax advantages, and Max has no other opportunity except to use the taxable bonds, then the federal government will collect its $4,000. The most radical changes that make taxable bonds the alternative that Max will use creates the baseline that makes the availability of tax-exempt bonds look like a subsidy program in which the gov-

To call the subsidy as "delivery efficient" as a government check is not to say that the subsidy is a good idea. Indeed, the § 103 exemption probably does considerably more harm than good overall. The subsidy induces people to shift their capital projects from the presumptively efficient profit-making sector over to the presumptively inefficient government sector, just to take advantage of the lower interest rates. States and municipalities undertake projects that they would not undertake if they had to meet the test of general (taxable) interest rates. The general interest rates are set by bidders competing for capital for worthy projects lined up by profitability and, hence, presumptively by worth; projects that are farther back in the line of worthy projects get funded by tax-exempt bonds over projects that are more worthy. A municipality will rationally borrow to the full extent that its credit allows, just to put off collecting taxes.[9] A subsidy for *less* borrowing would make municipalities more responsible. Still, a delivery efficient subsidy at least acts like a government check in that costs sent out arrive on site. In fact, the arrival on site is also the only justification for the program.

The exemption works less well as more borrowers try to use it. Max alone can take up the first $100,000 tax-exempt bond, but as other state or local borrowers come to the island with tax-exempt bonds, the implicit tax has to drop. If two $100,000 bonds are offered to the island economy, for example, interest on both bonds will have to be not $6,000 per year but $7,000. Max alone does not have the second $100,000 to invest, so that to sell $200,000, the next highest bracket buyer on the island, Middle, must be convinced to buy a bond. Middle, the 30% tax bracket investor, gets $7,000 from taxable bonds after tax. Middle has to be given a scintilla greater than $7,000 to move over to the exempt offering.

Once $7,000 is given to Middle, it must be paid to Max as well. There is no way to price discriminate among buyers. The market for bonds is anonymous, and if issuers tried to give $7,000 to Middle, but only the

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ernment received $4,000 and deliberately turned it over to the tax advantaged project. Roger Gordon & Gilbert E. Metcalf, *Do Tax-Exempt Bonds Really Subsidize Municipal Capital?*, 44 NAT'L TAX J. 71, 72 (1991) shows that a municipality deprived of the tax-exempt bond privilege should move over not to taxable borrowing, but should acquire its capital by immediate tax, called tax financing. Depriving its citizens of capital would deprive them of an after-tax return. The after-tax return would be less than $10,000 because it is taxed at least some. It is cheaper for the government and citizens, viewed as partners, to forgo private returns of $10,000 (less tax) than it is to pay the $10,000 interest. Thus, in absence of the exemption, there would be no private returns or borrowing paying interest and the Treasury would not make $4,000 revenue. The only way the Treasury could make revenue then would be to undertake the radical step of taxing municipalities on an implied or imputed capital return from use of its own capital in projects. Additionally, the benefit side of § 103 would be reduced as well, because in absence of § 103, the municipal-citizen combination would lose post-tax investment return at a level under $10,000, and would not pay the pretax $10,000 interest. The text does not incorporate Gordon and Metcalf's point in its presentation, but continues to use $10,000 as a baseline to measure costs and benefits. Gordon and Metcalf's point does not undercut the major point of this paper that the implicit tax shows how much a taxpayer is willing to pay to avoid tax under current conditions.

9. *See infra* discussion accompanying note 51.

$6,000 to Max, Max would just buy his bonds anonymously through Middle. High-bracket Max gets interest of $7,000, which is $1,000 more than his strike price to lure him away from taxable bonds. He is the inframarginal investor who gets a windfall or surplus over what he needs, because the market must reach the marginal investor, Middle, to sell off the offered bonds. The implicit tax on the bonds drops to equal the statutory tax rate of Middle—30%—the last investor needed to float the available issues.

With two $100,000 bonds offered to the island, investors with tax brackets lower than Middle's (i.e., 20%, 10%, and 0% on the five-person island) are rationally excluded from the tax-exempt bond. Lower-bracket taxpayers should find taxable interest and pay their tax. The explicit tax demanded in their lower bracket is less than the implicit tax, at 30%. This is as it should be. The lower the bracket of investors who can rationally buy tax-exempt bonds, the lower the implicit tax. The lower the implicit tax, the less efficient it is as a delivery vehicle and the more that Congress must look to inferior sources for revenue.

The drop in implicit tax is caused not just by bonds expressly tax exempt under § 103, but also because of the competition from other tax-exempt and tax-favored investments. Qualified pension plans, for instance, give taxpayers the benefit of investing untaxed money in funds that grow at tax-free rates, deferring tax until retirement. The combination of the untaxed initial investment and untaxed interim growth is ordinarily at least as valuable economically as the tax-exempt interest privilege of § 103.[10] Investments in computer software, advertising, mining, and oil drilling are similarly made with untaxed "soft-money" investments, because the investments are treated as deductible.[11] Making

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10. The terminal value of a tax-exempt investment is

(1) $C * (1 - t) * (1 + R)^n$

where $C$ is income that can be devoted to investment, $t$ is the tax rate, $C * (1 - t)$ is the capital available after tax on income, $R$ is the rate of return on the tax-exempt bonds and $n$ is the number of periods between the start of the investment. The terminal value of a "soft-money" investment such as a qualified pension plan is

(2) $C * (1 + R)^n * (1 - t_2)$

where $C$ can be invested without reduction by tax because contributions to qualified plans are excluded from employee income (where the employer makes the contribution) or deducted (where the employee makes the contrition). The growth $R$ occurs in a tax-exempt fund, and the tax at $t_2$ occurs only when the pretax $C * (1 + R)^n$ is withdrawn. Because of the cumulative law of multiplication, description (2) is equal to exemption (1), when $t$ is constant and better than exemption in the usual situation when $t_2$ drops in retirement.

The equivalence of descriptions (1) and (2) is known as the Cary Brown thesis. *See, e.g.*, Cary Brown, *Business-Income Taxation and Investment Incentives*, *in* INCOME, EMPLOYMENT AND PUBLIC POLICY: ESSAYS IN HONOR OF ALVIN H. HANSEN 300 (1948); DEP'T OF THE TREASURY, BLUEPRINTS FOR BASIC TAX REFORM 123-24 (1977); Stanley Surrey, *The Tax Reform Act of 1969 -Tax Deferral and Tax Shelters*, 12 B.C. INDUS. & COM. L. REV. 307 (1971); Calvin H. Johnson, *Soft Money Investing under the Income Tax*, 1989 ILL. L. REV. 1019 (1990).

11. *See* Rev. Proc. 2000-50, 2000 C.B. 601 (allowing immediate expensing of the investment costs of developing software); 1 BORIS I. BITTKER & LAWRENCE LOKKEN, FEDERAL TAXATION OF INCOME, ESTATES AND GIFTS ¶20.4.5 (2d ed. 1989) (describing the history of expensing of advertising costs, even those in the nature of investments); I.R.C. §§ 616,

investments with untaxed money gives a benefit that is at least as valuable economically as the tax-exempt privilege of § 103. Dynastic savings for the benefit of heirs can make use of tax exemption in the form of the step up in basis at death; appreciation in value of property is not taxed until a sale, and the tax on the appreciation during the holder's life disappears at death.[12]

The supply of tax-advantaged investments that compete with tax-exempt bonds include investments that are tax favored but not tax exempt. Owner-occupied housing is not quite tax exempt, but the major benefits of an investment in a house are the use of the house[13] and the fact that a half million dollars of gain on sale is exempt.[14] Accelerated depreciation, faster than real declines, will not make an investment tax exempt, but it will reduce the effective rate below statutory levels.[15] Tax-favored investments increase the supply that drives down the implicit tax even without being fully tax exempt.

As more tax-advantaged investments are offered to the island economy, the implicit tax drops even lower than 30%. If $400,000 in municipal bonds and like competitors are offered to the island economy, then taxpayer Minny, who gets $9,000 from taxable bonds, would have to be attracted to buy the last of the bonds. With the interest of $9,000 set by Minny's requirement, the implicit tax then is only ($10,000 - $9,000) / $10,000, or 10%, to find buyers for all four of the bonds. Again, no price discrimination is possible, so that once the $9,000 is offered to attract Minny, so as to sell the total $400,000 supply, the same $9,000 interest per year must be offered to all buyers, including Max, Middle, and Moderate. Max, Middle, and Moderate have a strike price for interest that is set by what they could get from taxable bonds (e.g., Max at $6,000, Middle at $7,000, and Moderate at $8,000). Purchasers do not need to reveal their strike prices in an anonymous market of purchasers and there is no way

617(a) (2002) (allowing expensing for development and exploring of costs of mining); I.R.C. § 263(c) (2002) (expensing allowed for oil drilling costs).

The economic equivalence of expensing of investments to exemption of the return from the investment is explained in *supra* note 10. There needs to be constant reinvestment of the interim cash flows in similarly expensed investments, however, for the soft money, untaxed capital advantage to be maintained. Advertising, for example, may give its total return quite rapidly, requiring that the profits be rolled back into more advertising (or other expensed investments) to maintain the untaxed status of the capital.

12. I.R.C. § 1014 (2002).

13. *See, e.g.*, James M. Poterba, *Taxation and Housing: Old Questions, New Answers*, 82 AM. ECON. REV. 237 (1992) (explaining deadweight loss in housing exemption and reduced advantages due to the 1986 Tax Reform Act).

14. *See* I.R.C. § 121 (2002). The exemption is $250,000 per taxpayer for $500,000 for a joint return. The exemption may be used only once every two years.

15. In a competitive economy that is not swamped by an oversupply of tax advantaged investments, the risk-adjusted, after tax returns should be the same throughout the economy, so that a low effective tax rate should yield an implicit tax for the low taxed investments such that the combination equals the maximum tax rate. *See, e.g.*, MYRON SCHOLES & MARK WOLFSON, TAXES AND BUSINESS STRATEGY: A PLANNING APPROACH 88-95 (1992). The Scholes and Wolfson discussion does not take account of the oversupply of tax advantaged investments or the empirical truth that the implicit tax rate on tax-exempt bonds is considerably lower than the maximum tax rate.

to price discriminate among the pool to give each investor only his or her strike price, given that any one could pose as Minny or buy through Minny. The tax rate of the marginal buyer needed to clear the supply sets the implicit tax for the entire pool and Minny is the marginal buyer. With a supply of four bonds offered to the island, interest must rise to $9,000 and the implicit tax must drop to 10%.

When the discount or implicit tax drops below the maximum statutory tax rate, then the tax exemption is no longer delivery efficient. The gains to the targeted beneficiary—the issuers—becomes just a fraction of the federal cost.

| Table 2. Cost and Benefit for $400,000 supply | | |
|---|---|---|
| | Federal cost | Target gain |
| Max (40%) | $ 4,000 | $ 1,000 |
| Middle (30%) | $ 3,000 | $ 1,000 |
| Moderate (20%) | $ 2,000 | $ 1,000 |
| Minny (10%) | $ 1,000 | $ 1,000 |
| Sum | $10,000 | $ 4,000 |

Table 2 displays that the target gets $1,000 per bond in cost savings, when $400,000 of tax-exempt bonds or equivalents are offered to the island, for a total benefit of $4,000. The federal cost is $10,000 in terms of the tax forgone, which represents all of the tax on capital from the island. The difference, or $6,000, is waste or loss to the middlemen in terms of the purpose of the program. The waste is attributable to infra-marginal investors, Max, Middle, and Moderate receiving benefits in excess of their strike price, that is, the fair market value interest needed to induce them to give up their taxable bonds. "Incentives" justify only the $1,000 dollar reduction per taxpayer, *but* they do not justify the extra $3,000, $2,000, and $1,000 above strike-price windfalls, for a total of $6,000, that infra-marginal investors receive.

The low implicit tax also reduces the real maximum tax rate available on the island to 10%. When Congress set tax rates applicable to the island, focusing on the policy behind the rates, it decided that taxes would do the least harm if Max, Middle, and Moderate contributed more than 10%. That decision has a rational basis. Dollars are more valuable in the hands of the poor than in the hands of the rich. To use cartoon examples to illustrate the point, Uncle Scrooge gets an infinitesimal amount of value from an extra dollar because he just adds it to the piles of coins in his swimming pool vaults. The Little Match Girl would get an infinite amount of value from an extra dollar because, for her, it would make the difference between life and death. Taxpayers display the phenomenon that dollars are more valuable the smaller their wealth, by buying insurance, saving for a rainy day, and avoiding investments that could lose all of their wealth. Tax does less ultimate harm if collected from wealthier

taxpayers. When the implicit tax is at 10%, however, a taxpayer asked to pay tax of more than 10% will flee to the implicit tax instead. The island economy will thus have to collect its taxes from inferior sources that do more harm to the utility of the island.

A low implicit tax would upset a rational plan of taxation, even one based on an entirely different scheme for tax. If Congress exempted the pious from tax and taxed Max only because of his sins—but exemption could still be readily purchased—then Max could avoid the sin tax at too low a cost. The implicit tax at lower than the maximum tax rates signals that there is trouble in the tax system.

### B. State of the Implicit Tax

According to the data available on municipal bonds and comparable taxable bonds, the implicit tax on municipal bonds is considerably lower than the maximum statutory tax rate. Table 3 shows the implicit tax over the last twenty years for bonds with 30 years until maturity, using AAA-rated municipal bonds and a baseline of 30-year taxable Treasury bonds. The AAA rating attempts to match the risks with the risks for the Treasury bonds.[16] The implicit tax rate, column (4), is the difference between the interest rate paid on taxable treasury bonds and the interest paid on the tax-exempt AAA municipal bonds, given as a percentage of the taxable federal interest rate:

$$\text{Implicit tax} = (ti - mi) / ti,$$

where *ti* is the Treasury interest rate and *mi* is the tax-exempt municipal bond rate. Table 3 also shows the maximum statutory tax rate, for comparison.

Chart 3 displays the data from Table 3, but includes not just the implicit tax on 30-year bonds but also the implicit tax on 20-year bonds. There are gaps in data for both the 30-year and the 20-year Treasury bonds, and the two series fill each other's gaps.[17]

16. *See infra* discussion of risk matching in text accompanying notes 35-42.

17. The Treasury computes the interest rate on its 20-year bonds by taking a sample of outstanding bonds and calculating yield to maturity. From 1987 through late 1993 it did not collect the sample or make the calculations. *See* Bd. of Governors of the Fed. Reserve Sys., Fed. Reserve Statistical Release, Historical Data, U.S. Gov't Sec., Treasury Constant Maturities (20-year), *at* http://www.federalreserve.gov/releases/h15/data/m/tcm20y.txt (last visited Feb. 1, 2003). The Treasury discontinued 30-year bonds in 2001. Jonathan Fuerbringer, *U.S. Will End Regular Sale of Long Bond*, N.Y. Times, Nov. 1, 2001, at C1.

| Table 3. Statutory Tax Rate and Implicit tax rate<br>Implicit tax from Treasuries and Municipal Bonds, AAA rated. 30-year term. | | | | |
|---|---|---|---|---|
| Date | (1) Maximum Statutory Tax Rate[18] | (2) Interest on 30-year Treasury bonds (%)[19] | (3) Interest on 30-yr. AAA Municipal bonds (%)[20] | (4) Implicit Tax Rate: [(col2)-(col3)]/(col3) |
| 12/31/1981 | 69.1% | 14.22 | 12.7 | 10.69% |
| 07/01/1982 | 50% | 13.55 | 12 | 11.44% |
| 12/31/1982 | 50% | 10.63 | 9 | 15.33% |
| 07/01/1983 | 50% | 11.40 | 9 | 21.05% |
| 12/30/1983 | 50% | 11.75 | 9.35 | 20.43% |
| 06/29/1984 | 50% | 13.21 | 10.4 | 21.27% |
| 12/31/1984 | 50% | 11.45 | 9.65 | 15.72% |
| 06/28/1985 | 50% | 10.50 | 8.4 | 20.00% |
| 12/31/1985 | 50% | 9.40 | 8.15 | 13.30% |
| 07/02/1986 | 50% | 7.27 | 7.3 | -0.41% |
| 12/31/1986 | 50% | 7.39 | 6.55 | 11.37% |
| 07/02/1987 | 38.5% | 8.64 | 7.6 | 12.04% |
| 12/31/1987 | 38.5% | 8.83 | 7.6 | 13.93% |
| 07/01/1988 | 34% | 9.14 | 7.6 | 16.85% |
| 12/30/1988 | 34% | 8.93 | 7.4 | 17.13% |
| 06/30/1989 | 34% | 8.08 | 6.85 | 15.22% |
| 12/29/1989 | 34% | 8.26 | 6.85 | 17.07% |
| 06/28/1990 | 34% | 8.50 | 7.1 | 16.47% |
| 12/31/1990 | 34% | 8.27 | 7 | 15.36% |
| 07/01/1991 | 34% | 8.45 | 6.95 | 17.75% |
| 12/31/1991 | 34% | 7.58 | 6.4 | 15.57% |
| 07/01/1992 | 34% | 7.60 | 6.25 | 17.76% |
| 12/31/1992 | 34% | 7.34 | 6.1 | 16.89% |
| 07/01/1993 | 41% | 6.63 | 5.45 | 17.80% |
| 12/31/1993 | 41% | 6.29 | 5.2 | 17.33% |
| 06/30/1994 | 41% | 7.58 | 6.3 | 16.89% |
| 12/30/1994 | 41% | 7.85 | 6.6 | 15.92% |
| 06/29/1995 | 41% | 6.72 | 5.9 | 12.20% |
| 12/29/1995 | 41% | 6.05 | 5.2 | 14.05% |
| 07/01/1996 | 41% | 7.03 | 5.75 | 18.21% |

18. Maximum statutory tax rates from 1981-1985 are from JOSEPH PECHMAN, FEDERAL TAX POLICY 303 tbl.A-1 (4th ed. 1985). Maximum statutory tax rates from 1986-1987 are from Michael Parisi & Dave Campbell, *Individual Tax Rates, 1997*, STAT. INCOME BULL. 6, 14 fig. G (Spring 2000). Maximum tax rates from 1988-1992 are corporate tax rates, IRC § 11, as amended by Pub. Law 99-514, § 601, 100 Stat. 2085, 2249 (1986). Maximum statutory tax rates, 1993-present, calculated *supra* note 6.

19. Data from Bd. of Governors of the Fed. Reserve Sys., Fed. Reserve Statistical Release, Historical Data, U.S. Gov't Sec., Treasury Constant Maturities (30-year), *at* http://www.federalreserve.gov/releases/h15/data/m/tcm30y.txt (last visited Feb. 1, 2003).

20. Municipal yields are from Thomson Municipal Market Monitor, Thomson Municipal Data-Line, *Historical AAA, General Obligation Yields* (on file with author).

| Table 3. continued. | | | | |
|---|---|---|---|---|
| Date | (1) Maximum Statutory Tax Rate | (2) Interest on 30-year Treasury bonds (%) | (3) Interest on 30-yr. AAA Municipal bonds (%) | (4) Implicit Tax Rate: [(col2)-(col3)]/(col3) |
| 12/31/1996 | 41% | 6.83 | 5.45 | 20.20% |
| 07/01/1997 | 41% | 6.51 | 5.4 | 17.05% |
| 12/31/1997 | 41% | 5.81 | 5.03 | 13.43% |
| 07/01/1998 | 41% | 5.68 | 5.05 | 11.09% |
| 12/31/1998 | 41% | 5.16 | 4.94 | 4.26% |
| 07/01/1999 | 41% | 5.98 | 5.33 | 10.87% |
| 12/31/1999 | 41% | 6.63 | 5.93 | 10.56% |
| 06/30/2000 | 41% | 5.85 | 5.72 | 2.22% |
| 12/29/2000 | 41% | 5.54 | 5.16 | 6.86% |
| 07/02/2001 | 40% | 5.61 | 5.22 | 6.95% |
| 12/31/2001 | 40% | 5.45 | 5.24 | 3.85% |
| 07/01/2002 | 40% | | | |

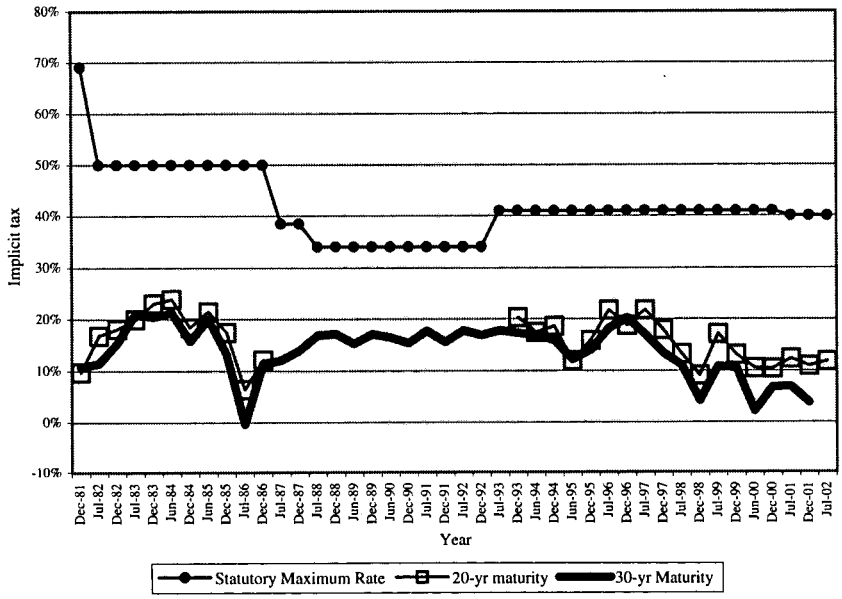


Chart 3

### *1. Trend Lines and Information Content*

The implicit tax on long-term bonds has never been close to the maximum statutory tax rate during the twenty-year course of the data shown in Table 3 and Chart 3. The Tax Reform Act of 1986 cut the maximum statutory tax rates, from 50% (paid by individuals) to 34% (paid by corporations), but it did not drop the implicit tax. It is the implicit tax and not the nominal statutory tax rates that set the real ceiling on what tax rates investors face. The 1986 Act did not get high bracket taxpayers to confess their real income in exchange for the cut in tax rates, as shown by

the fact that the highest bracket investors were not willing to pay 34% after 1986 to avoid tax through § 103. Still, the 1986 Act tried to cut tax rates without shifting the burden of tax downward onto poorer taxpayers, and the failure of the implicit rate to drop implies that the Tax Reform Act did not shift in favor of the highest bracket taxpayers.

After the 1986 Act, the implicit rate on 30-year bonds stayed stable in the 15-17% range for 10 years. The implicit tax reached a peak of 20% at the end of 1996. Since 1996, however, the implicit tax has dropped steadily. Since the end of 1997, the implicit tax on long-term bonds has been lower than the lowest tax bracket. At that level, *any* taxpayer called upon to pay any tax on savings would be better off buying tax-exempt bonds instead.

The trend line for 20-year bonds since 1996 is similar to the trend line for 30-year bonds but not so severe, as shown in Table 3B.

| Table 3B. Implict tax | | |
|---|---|---|
| Date | 20-year maturity | 30-year maturity |
| 06/29/1995 | 11.99% | 12.20% |
| 12/29/1995 | 15.85% | 14.05% |
| 07/01/1996 | 21.75% | 18.21% |
| 12/31/1996 | 18.80% | 20.20% |
| 07/01/1997 | 21.78% | 17.05% |
| 12/31/1997 | 17.96% | 13.43% |
| 07/01/1998 | 13.28% | 11.09% |
| 12/31/1998 | 9.14% | 4.26% |
| 07/01/1999 | 17.14% | 10.87% |
| 12/31/1999 | 13.15% | 10.56% |
| 06/30/2000 | 10.51% | 2.22% |
| 12/29/2000 | 10.46% | 6.86% |
| 07/02/2001 | 12.37% | 6.95% |
| 12/31/2001 | 10.94% | 3.85% |
| 07/01/2002 | 11.86% | no data |

The Treasury Department stopped issuing 30-year bonds at the end of 2001, and demand for the (then limited) bonds apparently drove the Treasury bonds' interest rate to new lows. Twenty-year bonds, which continued to be issued, also show a drop from the 20% range in 1996 to the 11-12% range in 2001-2002.

The drop in the implicit tax is apparently reflecting the fact that tax-exempt or competing tax-advantaged investments are swamping the demand. There are too many opportunities to avoid tax for investors to be willing to take a significant implicit tax on tax-exempt bonds. The tax base is rotting and at an apparently serious rate.

The data results are sloppy. It might be hoped that the implicit tax would yield a number that one could calculate out to four significant digits, which would reflect events affecting the tax base. A new wave of shelters should reduce the implicit tax, a wave of loophole closings or IRS court victories should increase the implicit tax. The market for Treasuries and municipal bonds, however, is not highlighting tax loopholes or tax reforms. Too many factors affect the relative interest rates of Treasuries and municipal bonds for the implicit tax to be a precise tool for fine detail.[21] The market displays irrationalities and herd overreactions.[22] Still, the current drop in implicit tax should be disturbing. Taxpayers are unwilling to pay very much to avoid tax on long-term bonds anymore, apparently because they have too many alternative ways to avoid tax.

The low implicit tax shown in Chart 3 is consistent with the failure of interest rates to cover tax when inflation rates change. Interest includes not just a real rent for use of money, but also a "fool's profit" to offset the loss in buying power of the dollars that were lent. The "fool's profit," or inflation offset, is taxed to the lender and is also deducted by a business borrower. Two taxpayers in the same tax bracket ought to increase their interest rate for predicted inflation, both to cover the inflationary loss in value of the dollars being lent and also the tax on the inflation offset. Assume, for example, that two corporations agree under zero inflation that Corporation A will lend to Corporation B for 6%. The corporate tax rate of about one-third reduces the lender's return to 4% after tax, but the deduction to Corporation B also reduces costs to 4%. Now assume

21. Peter Fortune, *Do Municipal Bonds Yields Forecast Tax Policy?*, 20 NEW ENG. ECON. REV. 29 (1996), found that municipal bond rates often moved in the wrong direction when tax reduction was raised in the 1996 Presidential debates, and when rates moved in the right direction in response to public discussions, they were often not statistically significant. Joel Slemrod & Timothy Greimel, *Did Steve Forbes Scare the Municipal Bond Market?* (NBER Working Paper No. 6583), *reprinted in* 74 J. PUB. HEALTH ECON. 81 (1999), find a correlation between election prospects of a candidate dedicated to exemption of capital income from tax and the implicit tax for 5-year bonds, but no correlation as to 30-year bonds.

Fortune attributes the lack of correction to "noise," primarily the effect of callability, which an issuer could exercise if alternative rates dropped. *But see* John M.R. Chalmers, *Default Risk Cannot Explain the Muni Puzzle: Evidence from Municipal Bonds that are Secured by U.S. Treasury Obligations,* 11 REV. FIN. STUD. 281 (1998) (using a sample of noncallable bonds to conclude that callability can not explain the low implicit tax).

22. The dramatic drop in implicit tax in the middle of 1986 seems to reflect a market overreaction to pending tax reform. There were reports of a large supply of municipal bonds as issuers rushed to market to avoid the pending 1986 Act's restrictions on industrial development bonds, arbitraging, deduction of interest costs and information reporting. *See, e.g.*, Andrew Leckey, *Municipal Bonds Gaining Luster*, CHI. TRIB., Aug. 14, 1986, at C1 (quoting Harry Waltman of Shearson Lehman Brothers to the effect that high rates on municipal bonds reflect unusually heavy supply due to issuers rushing to beat the effective dates of the bond limitations in the Tax Reform Act of 1986). If that is true then the market, collectively, was truly irrational because issuers gave up any benefit from tax exemption by swamping the market, such that the law of supply and demand took away the full benefit that issuers feared Congress might restrict in the future by mere statutory law. The drop in implicit tax might be illusory, however, because it disappears if we use corporate AAA bonds rather than Treasury bonds as the taxable bond used as the base line for comparison. *See infra* Chart 8 and the accompanying discussion.

that both corporations are accurately informed that inflation will rise to 3% per year during the course of their loan. That means that the dollars that Corporation B returns to Corporation A will decline in real value—the goods and services those dollars buy—by 3% year. To get the real 4% rent-like interest that the parties agreed to initially, Corporation A must get inflation interest, *ii*, such that:

(1) $ii\ (1 - t) = 4\% + \text{inflation}$ or

(2) $ii = (4\% + \text{inflation}) / (1 - t) = (4\% + 3\%) / (1 - 1/3) = 7\% / 66.66\% = 10.5\%$.

Equation (2), or 10.5%, also describes the amount that Corporation B should be willing to pay, because after the tax deduction for interest, and including the inflation offset, Corporation B's after-tax cost will be the same 4% real cost that Corporation B agreed to as the rent for money in the absence of inflation.

The market rate of interest, however, empirically has never carried a premium to cover tax. Interest rates apparently do eventually rise to cover most, perhaps all, of the inflationary loss, but they do not cover tax on the inflation offset.[23] Apparently, the marginal lender who sets the market interest rate expects to pay no tax on interest, so that the tax on fool's gain does no harm. Low implicit taxes on tax-exempt bonds are consistent with the theory that the marginal investor who receives Treasury interest pays little if any tax on it.

### 2. *Term Structure of the Implicit Tax*

The level of the implicit tax varies with the term of the bond.[24] As shown by Table 4, short terms mean higher implicit tax.

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23. *See, e.g.*, Martin Feldstein, *Inflation, Income Taxes, and the Rate of Interest: A Theoretical Analysis*, 66 AM. ECON. REV. 809, 816 n.15 (1976) (finding increases in interest rates that just match the increase of inflation, without regard to tax); Benjamin M. Friedman, *Who Puts the Inflation Premium Into Nominal Interest Rates*, 33 J. FIN. 833 (1978) (finding an increase in bond yield of only 0.64% in response to a one percent increase in expected inflation); Eugene F. Fama, *Term-Structure Forecasts of Interest Rates, Inflation, and Real Returns*, 25 J. MONETARY ECON. 59 (1990) (stating that interest rates do not meet changes in inflation). *See also* Martin Evans, *Real Rates, Expected Inflation, and Inflation Risk Premia*, 53 J. FIN. 187, 208 (1998) (explaining nominal interest's failure to keep up with inflation as indicating monetary fallacy that ignores changing real value of money).

24. C. EUGENE STEUERLE, TAXES, LOANS AND INFLATION: HOW THE NATION'S WEALTH BECOMES MISALLOCATED 23 (1985) shows implicit tax varying by term for the years 1954-1982.

| Table 4. Implicit tax as Term Increases July 1, 2002 (maximum statutory tax rate of 39.8%)[25] | |
|---|---|
| Term to Maturity | Implicit Tax |
| 1 year | 31.82% |
| 5 year | 25.78% |
| 10 year | 18.26% |
| 20 year | 11.86% |

Chart 4 shows how the implicit tax has varied for different terms since 1996.

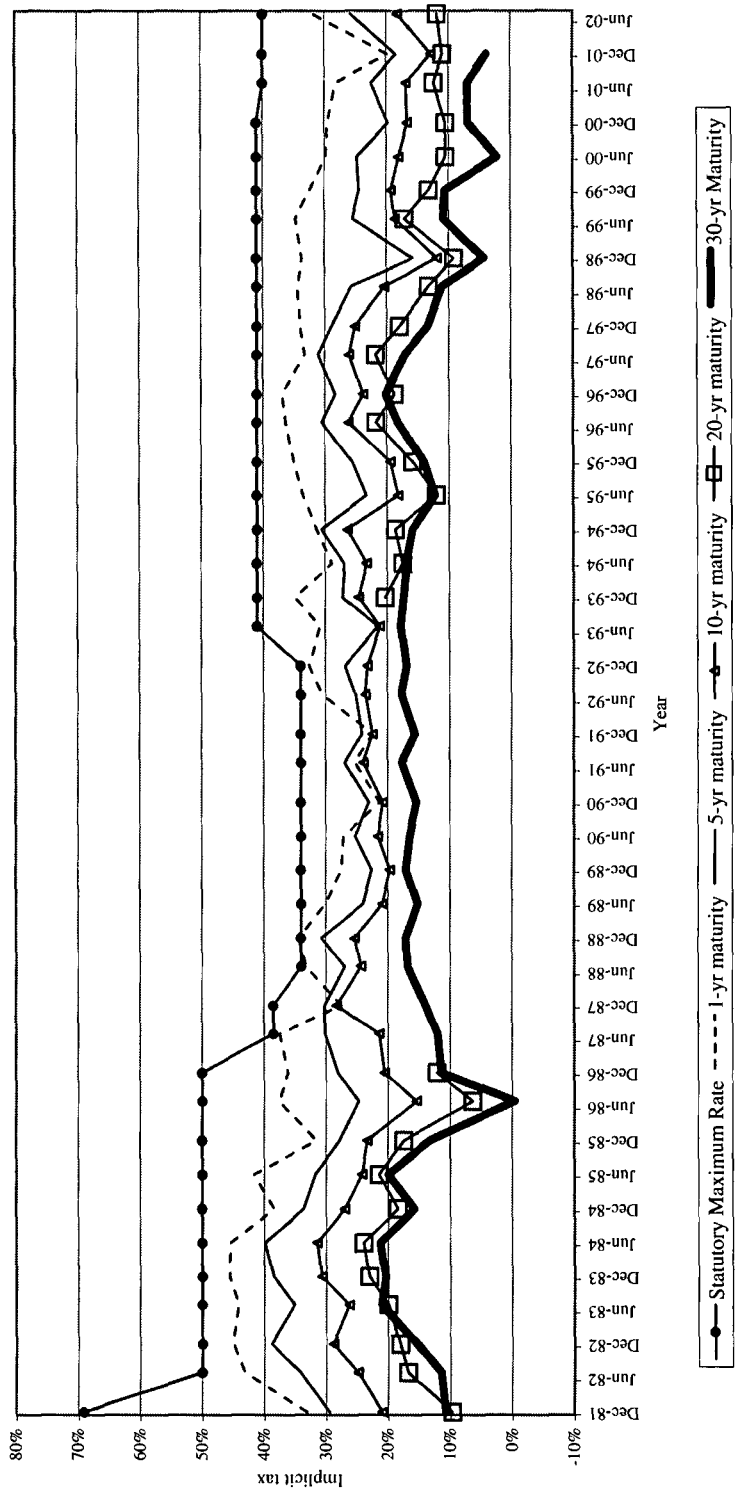
The structure, shown by Table 4 and Chart 4, is plausibly explained by the fact that the best alternatives to tax-exempt bonds are long-term investments. Investors are less willing to suffer a high implicit tax rate on long-term bonds because, if they are willing to invest for a long time, there are a number of alternative ways to get zero or very low effective tax rates. Qualified pension plans, for example, offer untaxed capital to invest and interim exemption of the return. The combination of the two benefits will ordinarily equal or exceed the benefit of the § 103 exemption. Qualified pensions should not even suffer any implicit tax because the funds normally buy taxable bonds in a public market. Withdrawals of funds from a qualified plan before retirement age, however, are ordinarily subject to a penalty tax of 10% of the taxed withdrawal, to encourage holding to retirement. It takes over a decade in the highest tax bracket for the qualified plans to overcome the 10% penalty so as to match even fully taxed debt.[26] To match municipal bonds, given the 10% penalty, the investor must now stay in the qualified plan for almost 40 years.[27] Individuals will give up tax exempts in favor of pension funds, but only if they are talking about investments of many years. Capital gains disappear on death, but it takes a while for mortality risks to mount up, and dynastic savings for the intentional benefit of heirs is only a small segment of the demand for savings.

Capital gain assets are an anomalous case for implicit tax because investors may react to the tax favors by decreasing rather than increasing the implicit tax. As investors flood into capital gain assets in reaction to the tax benefits, the pretax capital gain will increase, which *decreases* the implicit tax. The effective tax rate on capital gain assets approaches zero,

25. For the source of interest rates used to compute the implicit tax, see *supra* pp. 25-26.

26. The algebraic description of the terminal value of fully taxed debt is $[C * (1 - t)] * [1 + r * (1 - t)]^n$ where $C$ is the pretax income available to invested, $t$ is the tax rate, $r$ is the rate of return and $n$ is the number of years of growth. The algebraic description of the terminal value of a qualified pension plan subject to 10% penalty is $C * (1 + r)^n * [1 - t - 10\%]$. With $C$ of \$1, $t$ of 40%, $r$ of 4.26%, $[C * (1 - t)] * [1 + r * (1 - t)]^n$ will exceed not $C * (1 + r)^n * [1 - t - 10\%]$ until $n > 11.2$ years.

27. Ten-year AAA municipal bonds were paying 3.62% on September 20, 2002. Bloomberg.com, Municipal Bonds, *at* http://www.bloomberg.com/markets/munibondyield.html (last visited Sept. 22, 2002). $[C * (1 - t)] * [1 + 3.62\%)]^n$ will not exceed $C * (1 + r)^n * [1 - t - 10\%]$ until $n > 39.61$ years.


Statutory Maximum Rate
1-yr maturity
5-yr maturity
10-yr maturity
20-yr maturity
30-yr Maturity
Implicit tax
80%
70%
60%
50%
40%
30%
20%
10%
0%
-10%
Year
Dec-81
Jun-82
Dec-82
Jun-83
Dec-83
Jun-84
Dec-84
Jun-85
Dec-85
Jun-86
Dec-86
Jun-87
Dec-87
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Dec-97
Jun-98
Dec-98
Jun-99
Dec-99
Jun-00
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Jun-01
Dec-01
Jun-02

Chart 4

as mortality risks and time value of deferral of capital gain mount up, but it takes some time for the mortality risks and deferral to make the expected tax rate approximate zero.[28] The expected reaction to tax favors is an increase in implicit tax, but only for long term investments in which deferral and mortality risk reduce the impact of the statutory tax.

Housing is nearly exempt, primarily because of the tax exemption for the return that comes in the form of being able to live in the house, but also because of the exemption for up to $500,000 realized gain, as often as every two years. The transaction costs of selling, buying, moving, and readjusting to a house tend, however, to make owner-occupied homes a long-term investment.

The investor side of the market for long-term tax-exempt bonds will not accept much implicit tax because there are ample alternatives to tax exemption. For short-term investments, however, the investor generally needs liquidity or, at least, the ability to make a quick sale. There seem to be fewer tax-exempt opportunities or alternatives available to individuals, except for short-term municipal debt, that are liquid, saleable, and tax free. Thus, the market accepts a large implicit tax on short-term tax-exempt bonds because the alternatives are sparse.

As a matter of logic, the lower implicit tax for longer term investments might also be a result of investor fears that the value of their tax exemption might go down in the future. If the United States were to adopt a consumption tax, which gives a zero-effective tax rate for all investments, the extra value of tax-exempt bonds would disappear. Investors might also fear a future drop in tax rates that would reduce the value of their exemption. Less plausibly, but still possible, investors might fear that their existing exemption will be taken away from them retroactively and without compensation. The fear of loss of value from exemption would increase as the term increases because the near future is better estimated than the distant future.

There is good reason for skepticism about the importance of the fear of future diminuation of the value of tax sheltering. First, risk-adverse investors have more to fear from a rise in tax rates because of the general effect of higher taxes on standard of living. Tax-exempt bonds are a kind of insurance policy that move in value contrary to the detriment of tax. If dread is higher as to the distant future than the near future, the insurance value of the bonds should increase. Moreover, future inflation will increase real tax because there is tax on "fool's profits," that is, the interest that just offsets the cost-of-living value of the dollar's rent. Inflation rates are now low compared to the not-too-distant past, implying that investors have very good reason to fear future inflation and future fool's tax. The fool's tax on future inflation would increase the value of the exemption for longer distant years.

28. Calvin H. Johnson, *The Undertaxation of Holding Gains*, 55 TAX NOTES 807 (1992).

Market movement on long-term bonds, moreover, does not seem to be very well correlated with news that might affect future tax on capital. There was a good deal of debate in the 1996 Presidential Campaign, led by Steve Forbes's advocacy of repeal of tax on capital returns.[29] If Forbes was taken seriously, the implicit tax should have dropped, when in fact it rose during 1996. The Tax Reform Act of 1986 promised to be revenue neutral for high-income taxpayers by closing loopholes. The promise of more thorough tax on capital income should have increased the implicit tax, but in fact the implicit tax plummeted as issuers swamped demand trying to get out bonds to beat the Tax Reform Act effective dates.[30] Thirty-year bonds should be reacting to long-term prospects that may not be influenced much by current news, but the fact that implicit tax movement is in the wrong direction in response to news gives ground for skepticism that the term structure of bonds is caused by projections about future tax changes.

In any event, the delivery efficiency of tax-exempt bonds goes down when implicit tax rates go down, no matter what the cause of the low implicit tax. Fear about the future value of a tax privilege, if that is what is being reflected in the market, is one of the very good reasons why government checks are more efficient than tax advantages and why tax advantages are such inferior delivery vehicles.

### *3. Delivery Efficiency*

For the full twenty years of the data in Chart 3 and Table 3, the tax exemption for state and local bonds has been an extraordinarily wasteful vehicle for delivery of a subsidy. The implicit tax represents what issuers of tax-favored investments get out of their tax advantage. Chart 5 charts the same data as Chart 3, but the rent or windfall of the top-bracket investor is marked in black. The implicit tax (the white area in Chart 5) reflects what the issuers capture of the tax forgiven in the maximum tax rate.

Chart 5 shows that only a fraction of the revenue lost in the top brackets is captured by the state or local issuer of the bond. Table 5 shows the *same* information as Chart 5, expressing the amount captured by the intended beneficiary as a fraction of the maximum tax lost.

Over the last twenty years, tax-exempt bonds have, at best, lost half of their cost in the top bracket, and failed to deliver it on site. In recent years, the losses are increasing, so that at least 70%, and as much as 90%, of the cost in top brackets is lost and a waste from the perspective of the purposes of the program. Consequently, advocates who argue that the function of the tax-exempt bond program is to help states and localities are as much as 90% wrong.

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29. *See* Slemrod & Greimel, *supra* note 18 (discussing Forbes and the absence of reaction in long term bonds). Chart 3 shows a mild *increase* in implicit tax during 1995-1996 as the exemption of tax of capital was being debated.

30. On the swamping by issuers before 1986, see *supra* note 19.

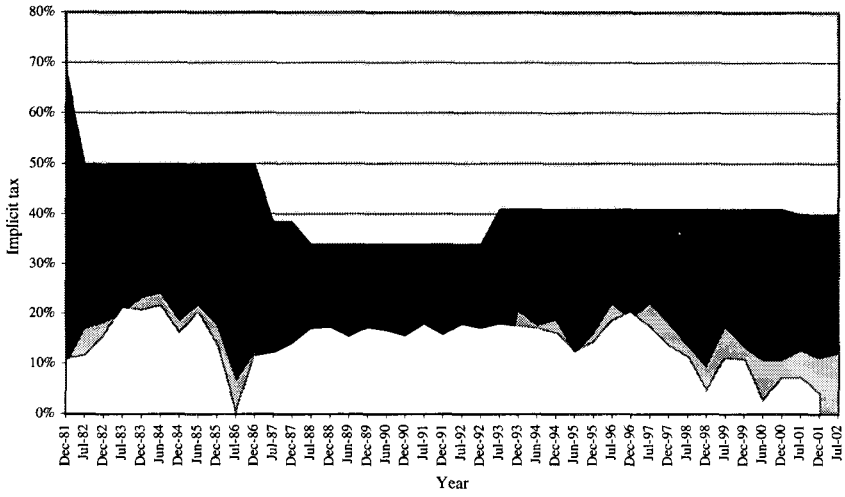


Chart 5

The implicit tax on municipal bonds also sets strict limits on how efficient it can be to use the tax system to subsidize any activity, even beyond municipal borrowing. A tax expenditure is a contraction in the tax base to subsidize some activity,[31] and no tax expenditures are delivery efficient under the conditions displayed in Chart 5. All investors are looking for maximum after-tax return. The standard yardstick of investment is net present value, which uses the best available alternative after-tax return to discount anticipated future cash from the examined investment to a present value. Any investment with a return less than after-tax interest on municipal bonds would have a negative net present value and be rejected in favor of the municipal bonds.[32]

Investments compete for buyers in a common sea. Driven by net present value or return analysis, the returns from all investments will tend toward the same sea-level after tax returns. Even if features like risk and term vary, all investments compete at the margin with investments with only slight variations of the important feature so that all investments vary along a continuum in which investments compete at the borders. The interest paid by tax-exempt bonds thus represents a floor under which investors will not go and need not go. Even if the federal government is losing tax measured in the highest bracket, the tax-exempt rate still sets a limit on how much of that cost can be delivered on site to the intended beneficiary. Other subsidy programs, such as expensing of research and development costs, fast depreciation deductions, and exclusions for housing, cannot be any more efficient than the tax-exempt bond program. The only difference is that the tax-exempt bond program leaves behind

31. Stanley Surrey, *Tax Incentives as a Device for Implementing Government Policy: A Comparison with Direct Government Expenditures*, 83 HARV. L. REV. 705 (1970) is the seminal argument.

32. *See, e.g.*, JAMES C. VAN HORNE, FINANCIAL MANAGEMENT AND POLICY 9-19, 143-78 (10th ed. 1995) (explaining present value analysis).

| Table 5. Percentage of Federal Cost Lost to Middleman Investors for 20- and 30-year bonds. | | | | | |
|---|---|---|---|---|---|
| | (1) Maximum Tax | (2) Implict tax 20-year maturity | (3) Fraction lost | (4) Implict tax 30-year maturity | (5) Fraction lost |
| 07/01/1982 | 50.00% | 16.78% | 66.43% | 11.44% | 77.12% |
| 07/01/1983 | 50.00% | 19.96% | 60.07% | 21.05% | 57.89% |
| | | | | | |
| 07/02/1986 | 50.00% | 6.37% | 87.26% | -0.41% | 100.83% |
| | | | | | |
| 07/01/1992 | 34.00% | | | 17.76% | 47.76% |
| 07/01/1993 | 41.00% | | | 17.80% | 56.59% |
| | | | | | |
| 07/01/1997 | 41.00% | 21.78% | 46.87% | 17.05% | 58.41% |
| 07/01/1998 | 41.00% | 13.28% | 67.62% | 11.09% | 72.95% |
| 07/02/2001 | 40.00% | 12.37% | 69.07% | 6.95% | 82.62% |
| 07/01/2002 | 40.00% | 11.86% | 70.35% | no data | |

evidence in the form of published interest data that allows the inefficiency to be revealed.

With municipal bonds delivering only 10% of their cost in the highest brackets on site, and wasting 90% by overpaying the middlemen, it seems immoral at this point to suggest that the tax system be used to subsidize even a good activity. It is fraud on the democracy to claim that the purpose of the tax expenditure is to benefit the good program, when as much as 90% of the cost is lost, and only 10% of the cost is delivered to the good works. Politicians of good faith cannot offer or accept use of reductions in taxable income as a means to accomplish good works.

### C. Critiques and Qualifications

There are a number of criticisms and qualifications to the argument that the implicit tax is too low and that it displays an unhealthy tax system. First, a modest implicit tax sometimes ameliorates over-taxation due to inflation. Second, risk differentials can upset the accuracy of the implicit tax as a measure of health. Third, an investor will accept no implicit tax with respect to capital gains on bonds and capital gains might explain part of the low implicit tax. Fourth, the appropriate remedy might be to increase the demand for municipal bonds rather than to restrict the supply of tax advantages.

#### *1. Implicit Tax and Inflation*

As noted, some of the interest that a lender receives is not a gain at all, but merely offsets the effect of inflation. Statutory tax rates, stated as a

percent of real interest, have often been extraordinary, that is, more than confiscation, that is, more than 100%. Table 6 shows the real tax rate on one-year Treasury bonds between 1996 and 2002: columns (1) through (3) compute the tax on nominal interest for one-year Treasuries. Columns (4) through (5) compute the real interest rate by subtracting the inflation during the year (as measured by the consumer price index) from the interest given by one-year Treasury bonds.[33] Column (6) computes the tax, from column (3), as a percentage of real (after inflation rate) interest from column (5).

Table 6. Tax on Real (post inflation) Interest

| Date (yr end) | (1) Interest 1 yr Treasuries (in %) | (2) max tax rates | (3) col (2) tax on col (1) | (4) Inflation (in %) | (5) real interest: col (1)-(4) | (6) col (3) tax on col (5) real interest |
|---|---|---|---|---|---|---|
| 1981 | 12.85 | 69% | 8.88% | 6.05 | 6.80% | 130.6% |
| 1982 | 8.91 | 50% | 4.46% | 2.40 | 6.51% | 68.5% |
| 1983 | 10.11 | 50% | 5.06% | 4.03 | 6.08% | 83.2% |
| 1984 | 9.33 | 50% | 4.67% | 3.43 | 5.90% | 79.1% |
| 1985 | 7.67 | 50% | 3.84% | 1.55 | 6.12% | 62.7% |
| 1986 | 5.87 | 50% | 2.94% | 3.78 | 2.09% | 140.3% |
| 1987 | 7.17 | 39% | 2.76% | 3.97 | 3.20% | 86.2% |
| 1988 | 8.99 | 34% | 3.06% | 4.74 | 4.25% | 72.0% |
| 1989 | 7.72 | 34% | 2.62% | 4.60 | 3.12% | 84.2% |
| 1990 | 7.05 | 34% | 2.40% | 4.26 | 2.79% | 85.9% |
| 1991 | 4.38 | 34% | 1.49% | 3.06 | 1.32% | 112.9% |
| 1992 | 3.71 | 34% | 1.26% | 2.70 | 1.01% | 125.0% |
| 1993 | 3.61 | 41% | 1.48% | 2.70 | 0.91% | 161.8% |
| 1994 | 7.14 | 41% | 2.93% | 2.69 | 4.45% | 65.8% |
| 1995 | 5.31 | 41% | 2.18% | 2.87 | 2.44% | 89.1% |
| 1996 | 5.47 | 41% | 2.24% | 2.18 | 3.29% | 68.2% |
| 1997 | 5.53 | 41% | 2.27% | 1.65 | 3.88% | 58.5% |
| 1998 | 4.52 | 41% | 1.85% | 2.10 | 2.42% | 76.6% |
| 1999 | 5.84 | 41% | 2.39% | 3.53 | 2.31% | 103.7% |
| 2000 | 5.60 | 41% | 2.30% | 2.65 | 2.95% | 77.8% |
| 2001 | 2.22 | 40% | 0.89% | 1.44 | 0.78% | 114.4% |

What is true of statutory tax rates is also true of implicit tax. When the implicit tax rates are restated as a percentage of interest from which the inflation offset has been subtracted, implicit tax can be extraordinarily high. Chart 6 shows the implicit tax rates for various maturities, as shown in Chart 5, but restates the implicit tax as a percentage of real interest.

33. Bureau of Labor Statistics, Consumer Price Index, *available at* http://www.bls.gov/cpi/home.htm (last visited Sept. 6, 2002).

Chart 6A has the same logic, but focuses only on the long term (20-30 year) maturities.

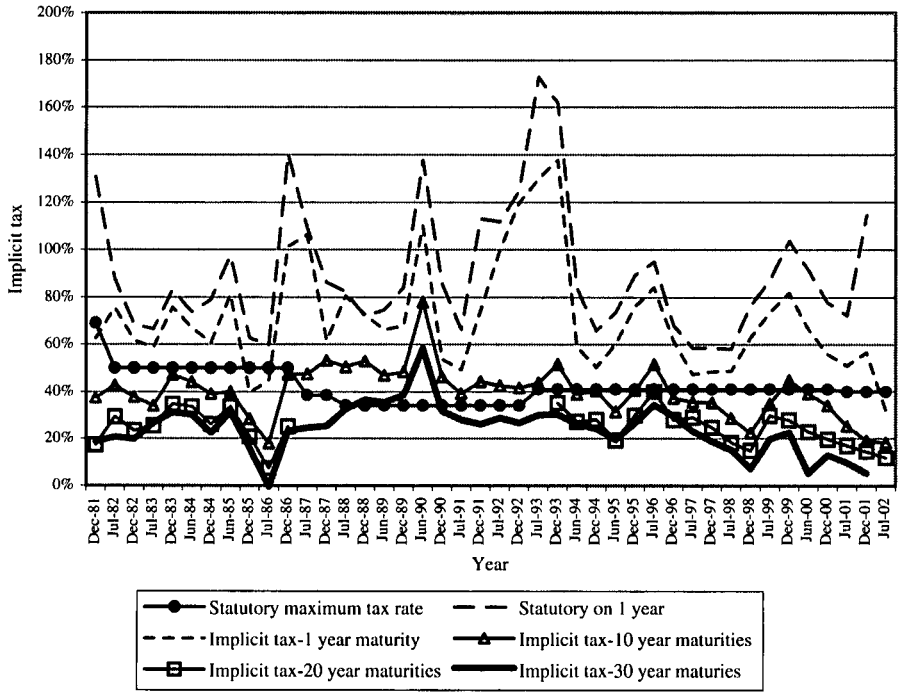


Chart 6

As shown by Charts 6 and 6A, even implicit tax can reach extraordinary rates when inflation offsets are taken out of interest. The implicit tax on short-term municipal bonds is commonly in excess of 100%. Charts 6 and 6A show the statutory maximum tax rates. The implicit tax on one-year maturity municipal bonds did not drop down to below the stated statutory tax rate for the twenty year period between 1981 and 2001.

For longer term bonds, isolated in Chart 6A, there was a spike in inflation in 1990 that made the implicit tax on real income rise to a peak over the maximum tax rates. Longer term bonds have not generated confiscatory implicit tax (i.e., rates greater than 100%) in the twenty-year period.

If we treat the maximum statutory tax rate as the normative base, because it was determined by the democracy acting through Congress, then tax rates that rise above the statutory tax rates represent unintended and inappropriate burdens. Dollars have meaning only because of the items of a standard of living that they can purchase, and dollars that just match inflation are fool's profits, a monetary illusion. The inflation offset should therefore be subtracted from interest subject to tax. The commonness of confiscatory real (inflation adjusted) tax rates for short-term

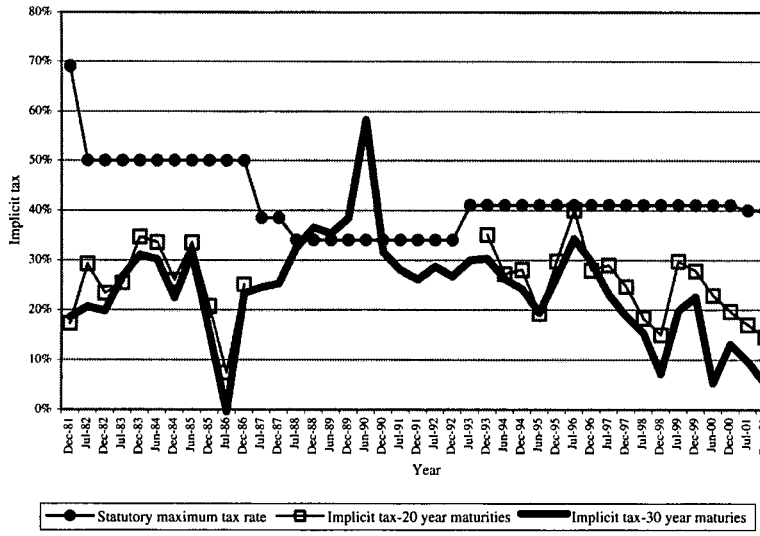


Chart 6A

borrowing do prove that consumers are willing to save even in the face of a penalty, a negative reward for saving. Saving carries dollars over to periods where they are needed more desperately. Still, both the statutory and the market-set implicit taxes on short-term lending or saving are too high. Capture of the benefits by the issuer is too high if the capture represents an implicit tax rate higher than the intended statutory tax rate. From the point of view of equity, the failure of implicit tax to capture the full federal cost is a good thing, to the extent that the implicit tax on real interest that remains is as high as the intended statutory tax rate.

For the long-term 20- to 30-year term bonds, however, the implicit tax has usually been well under the statutory maximum rates even when adjusted for inflation. For long-term bonds, the taxation of the offset to inflation reduces, but does not cure the windfall available to investors in high brackets.

Inflation adjustments have no affect on the percentage of the federal cost that is lost or wasted within the defining purposes of § 103, as displayed in Table 5 and Chart 5. Whether we state the fraction of the government cost lost in terms of nominal or inflation-subtracted interest, the fraction captured by the issuer and the fraction captured by the high-bracket middleman remains the same. When stating what fraction implicit tax represents of statutory tax rates, any constant tax base simplifies out of the equation.[34]

34. Implicit tax on real interest is $(mpl * int) / (int - f)$, where $mpl$ is the implicit tax, $int$ is the nominal interest and $f$ is inflation. Treasury would collect tax at rate $t$ on $int$, or $t * int$, and that tax is a fraction of real interest $t * int / (int - f)$. The fraction of the Treasury lost revenue that is captured by implicit tax is:

(1) $(mpl * int) / (int - f) / t * int / (int - f)$

Equation (1) simplifies to $imp / t$ that is implicit tax rate divided by statutory tax rate.

*2. Matching Risk*

Implicit tax might appear misleadingly low just because municipal bonds are riskier than Treasury bonds of the same term. For instance, if Treasuries are giving 5% interest, and municipal bonds are giving 4%, it looks like the implicit tax is just 20%. Assume, however, that the 4% on municipal bonds reflects a 1% premium interest paid by the municipality for extra risk. The reality then would be a drop in interest rate of 2% that reflects an implicit tax that captures the full statutory tax rate, 40% of the Treasury interest, but which is hidden by the 1% risk premium.

The Standard and Poor's AAA rating, used for all the municipal bonds in this paper, reflects the safest, lowest risk municipal bonds, and should filter out most risk differentials. Still, nothing can match the safety of Treasury bonds because the Treasury can pay off its debts with money it prints, even just for the occasion. Printing money would increase inflation, but only a trivial fraction of the inflation caused by paying off any set of bonds would be borne by the bond holders themselves. Moreover, foreign investors, especially, may prefer bonds backed by the full faith and taxing power of the U.S. government, rather than bonds backed only by the taxing power of a state or local issuer, even if the rating agency considered the state or local bond to be safe. Treasuries are considered to be base-line zero-risk bonds, which even the maximum-safety municipal AAA rated-bonds cannot match.

Risk does not appear to explain the low apparent implicit taxes. Professor John Chalmers has studied a sample of municipal bonds that had the same risk as Treasury bonds because they were fully secured by federal bonds;[35] Prior to the Tax Reform Act of 1986, states and localities could get debt off their books by "defeasance," that is, by depositing funds into an escrow dedicated to future repayments of the bonds. The escrow was cheaper in present-value terms than actually paying the bonds because the escrow agent would buy taxable Treasury bonds, which were absolutely safe, but gave a higher rate of return by the amount of the implicit tax. The escrow did not suffer tax on the Treasury bonds because the escrow was just an accounting arm of the tax-exempt state or local issuer. The Tax Reform Act of 1986, enacting the anti-arbitrage restrictions of § 149(d), ended the advantage, except for thin allowances[36] and

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If there is no inflation or we ignore it, then there is no *f* in the equation and the fraction of Treasury cost captured by issuers is

(2) *imp* * (*int*) / (*int*) / *t* * *int* / (*int*)

Equation (2) also simplifies to *imp* / *t*.

35. John M.R. Chalmers, *Default Risk Cannot Explain the Muni Puzzle: Evidence from Municipal Bonds that are Secured by U.S. Treasury Obligations*, 11 REV. FIN. STUD. 281 (1998) (finding that risk does not explain implicit tax). *Accord* Stephen A. Buser & Patrick J. Hess, *Empirical Determinants of the Relative Yields on Taxable and Tax-exempt Securities*, 17 J. FIN. ECON. 335, 344-45 (1986) (finding no correlation between implicit tax and default risk on municipal bonds).

36. Tax Reform Act of 1986, § 1301(b), Pub. L. No. 99-514, 100 Stat. 2646 (enacting I.R.C. § 149). The thin allowances meant that funds could be deposited in escrow for up to

for transition rules for bonds issued before 1986.[37] For years prior to 1986 and extending after that within the transition rules for previously issued bonds, the defeasance or refunding escrows left a sample of tax-exempt municipal bonds that were fully secured by Treasury bonds. Because the Treasury bonds in the escrow accounts were zero base-line risk, so were the municipal bonds that they secured.

Chart 7 displays the implicit tax on the zero-risk municipal bonds used in Professor Chalmers' study (labeled "Implicit Tax: No Risk Munis v. Treasuries").[38] Chart 7 also shows the implicit tax used in Charts 3 through 6, computed by comparing Treasury bonds with AAA municipal bonds that were not secured by Treasury bonds.

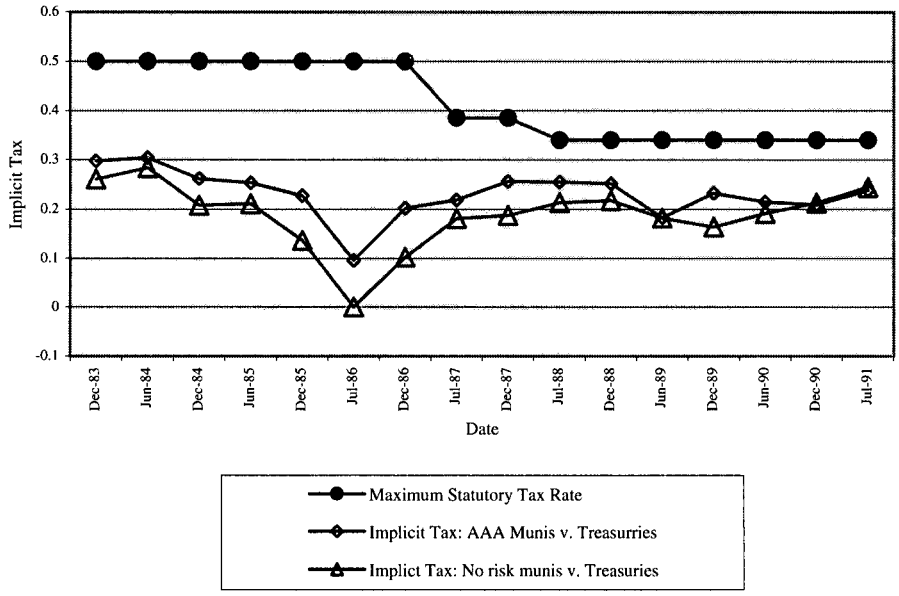


Chart 7

Chart 7 reveals a market misperception of the zero-risk municipals. In theory, the implicit tax on the zero-risk Treasury-backed municipal bonds should be higher than the implicit tax on normal AAA municipal bonds. Using the Treasury bonds to back the municipals reduces the risk on the

three months before the tax-exempt bonds were redeemed and interest on the escrowed funds could be as much a one-thousandth of one percent above the bond interest rate. I.R.C. § 149(d)(5) (2002); Treas. Reg. § 1.148-2(d)(2)(ii) (1997).

37. *See* STAFF OF J. COMM. ON TAX'N, GENERAL EXPLANATION OF THE TAX REFORM ACT OF 1986, at 1213-16 (1987).

38. I thank J.J. Kenny & Co., which assembled the sample underlying Chart 7, and Professor Chalmers for providing access to the data.

municipal bonds by some small measure, and the lower risk should be reflected in lower interest rates that would *increase* the implicit tax. Chart 7 shows that the Treasury-backed municipal bonds actually gave a higher interest rate return than the ordinary AAA municipal bonds, which decreases the implicit tax. The market apparently did not appreciate that the Treasury-backed defeasance bonds were safer even than AAA municipal bonds. If Treasury bonds have base line zero risk, then so do the bonds they back. Notwithstanding the anomaly, the fact that AAA municipal bonds without backing display a greater implicit tax gives us some confidence that the low level of implicit tax on unbacked AAA municipal bonds is not a product of the default risk that is perceived by the market.

An alternative to using Treasury bonds as the base line is to use AAA corporate bonds.[39] Charts 3 through 7 found implicit tax by subtracting tax-exempt AAA interest from Treasury for the same term, but Chart 8, following, finds implicit tax by subtracting tax-exempt AAA interest from taxable interest on AAA corporate bonds.[40]

Chart 8 also shows the implicit tax using Treasury bonds as a base line for 10-year and 30-year bonds. If there were no risk differences between AAA corporate bonds and Treasuries, then the implicit tax on 15-year municipal bonds, shown as the bold line in Chart 8, would run about midway between the two finer lines which represent the implicit tax computed using Treasuries as the base line. The bold line runs outside of the fine lines because the market perceives corporate AAAs as riskier than Treasuries. That the trend line using Corporate AAAs is not midway between the fine lines does not say anything about the nature of municipal bonds, because the departure from the midway is the product solely of differences in the base line used.

Using AAA corporate bonds as a base line, as shown in Chart 8, makes the dip in the implicit tax immediately before the Tax Reform Act of 1986 disappear. Both Treasuries and AAA corporate bonds are taxable in the same way, and the question of whether there is a dip or not depends upon which taxable bond is used as the baseline. The fact that there is a dip even in zero-risk municipals implies that the dip is real, and that would mean that the stable implicit tax implied by using AAA corporate bonds

39. Jeffrey L. Skelton, *Relative Risk in Municipal and Corporate Debt*, 38 J. FIN. 625, 629 (1983) (finding that municipal bonds and corporate bonds had almost the same volatility, measured by standard deviation of value, using data from 1973-1979). *But see* John M.R. Chalmers, Systematic Risk and the Relation between Tax-exempt and Taxable Yields (Working Paper, Feb. 23, 2001) (finding that volatility of taxable federal bonds and municipals are too similar for risk to explain high after-tax rates on municipal bonds), *at* http://lcb1.uoregon.edu/jchalmer/Research/c2_muni_feb01.pdf (last visited Feb. 3, 2003).

40. Interest rates on AAA fifteen-year corporate bonds are from http://www.globalfindata.com (file name: SPAA15Q.csv) (last visited Aug. 15, 2002). Interest rates on AAA fifteen-year tax-exempt municipal bonds are from *Thomson Municipal Market Data Line: Historical AAA, General Obligation Yields*, *at* https://www.tm3.com/mmd/g_14906_w.html (last visited Aug. 25, 2002), as supplemented by various issues of STANDARD & POOR'S CREDIT WEEK.

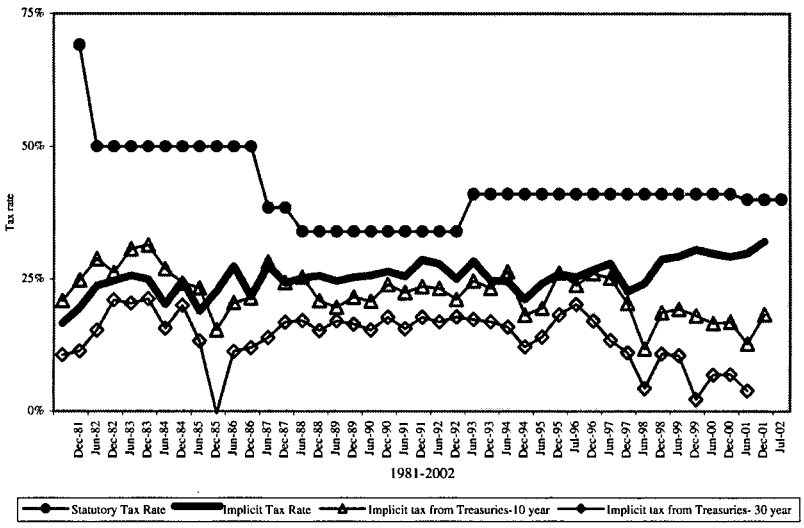


Chart 8

as the base comes from AAA corporate bonds becoming temporarily riskier due to the same causes that made municipal bond rates climb. There is some plausibility to that. The 1986 Act turned out to shift a great deal of tax from individuals onto corporations[41] and the higher pending taxes might have increased the market's perception of credit risk even before passage of the Act. Except for the issue of the pre-1986 dip, the news carried by both bases is compatible from 1981 to 1995. Even the greater implicit tax computed using AAA corporate bonds shows a less-than-full capture of the cost of tax-exempt bonds to the Treasury by the intended target. Municipal bonds are an unacceptably inefficient delivery mechanism even when AAA corporate bonds measure the implicit tax.

Since 1995, however, the implicit tax (using Treasuries) has been plummeting and the implicit tax computed using the two different baselines has separated. Chart 8A graphs the implicit tax since 1996 for fifteen-year bonds, using the AAA corporate bonds and then Treasuries as the base line.

The divergence of the two measures of implicit tax is solely a matter of which baseline to use. The *divergence* does not say anything about the relationship of taxable to tax-exempt returns since the divergence occurs solely because of differences between two taxable bonds.

Nonetheless, the Treasury bonds seem to be a better base for measurement of the implicit tax. The AAA rating is the highest rating for maximum safety, but corporations can lose their ratings before the end of a thirty-year term. A high rating lost by the time a holder sells the bond does the holder no good. As Table 8B shows, AAA corporate bonds

41. STAFF OF J. COMM. ON TAX'N, GENERAL EXPLANATION OF THE TAX REFORM ACT OF 1986, at 1378 (1987) (showing individual taxes going down by $122 billion, but corporate taxes going up by $120 billion).

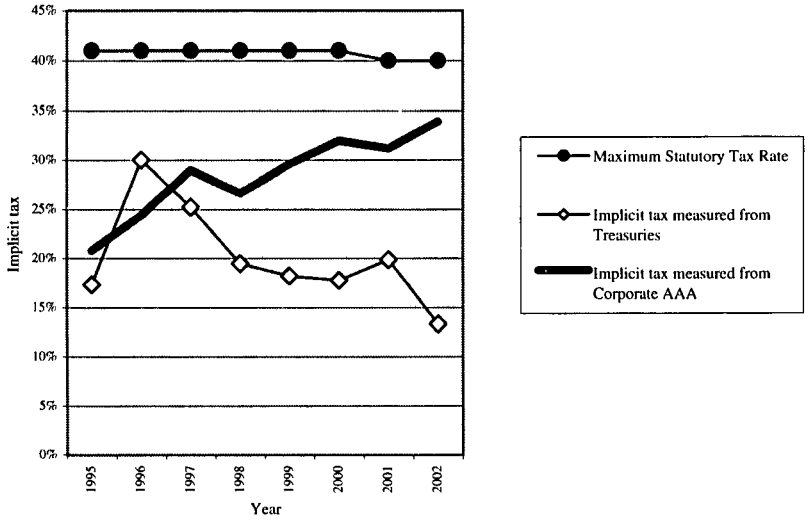


Chart 8A

have been seen by the market as increasingly risky, vis-à-vis Treasuries in recent years.[42]

| Table 8B. Increasing risk of Corporate AAAs | | | |
|---|---|---|---|
| | (1) Interest rate on 10 year Treasuries | (2) Interest rate on 10 year AAA Corporates | (3) Risk Premium [col(1)-col(2) as % of col(1)] |
| 1995 | 6.2% | 6.4% | 4.38% |
| 1996 | 6.9% | 6.4% | -7.43% |
| 1997 | 6.4% | 6.8% | 5.30% |
| 1998 | 5.4% | 6.0% | 9.74% |
| 1999 | 5.9% | 6.8% | 16.18% |
| 2000 | 6.1% | 7.4% | 20.89% |
| 2001 | 5.5% | 6.4% | 16.42% |
| 2002 | 4.7% | 6.1% | 31.18% |

Table 8B and Chart 8A convey the same information in different formats. The implicit tax computed using AAA corporate bonds is vastly different from the implicit tax computed using Treasuries solely because even the lowest risk AAA corporate bonds are being perceived as increasingly risky.

The dramatic and increasing differences between computation of implicit tax that depend on which base is used highlight the importance of matching risk and term of the municipal bond and the taxable bond used

42. Interest on 10-year Treasury bonds can be found on the Federal Reserve website. Bd. of Governors of the Fed. Reserve Sys., Federal Reserve Statistical Release: Selected Interest Rates, *at* http://www.federalreserve.gov/releases/h15/data/wf/tcm10y.txt (last visited Jan. 23, 2003).

by comparison. The AAA rating is the best available for matching risk, but it is apparently not filtering out market perceptions of risk. The Chambers-Kenny database can not be replicated beyond 1991 because of the expanded restrictions on arbitraging by the issuers. Issuers can no longer hold taxable Treasuries to secure tax-exempt bonds. Given, however, that the implicit tax on zero-risk municipal bonds traces the pattern of implicit tax on unbacked AAA municipal bonds, and given the increasing perceived riskiness of AAA corporate bonds in recent years, the Treasury base line seems the better one to use.

*3. Capital Gain*

Capital gains and losses are taxed the same whether they are produced by a taxable or a tax-exempt bond. Gain from sale of a municipal bond is taxable capital gain, even for municipal bonds for which the interest is tax exempt under § 103.[43] If interest rates available elsewhere drop, a fixed-interest-coupon bond will go up in value, whether the interest is taxable or tax exempt. If the holder sells a municipal bond after holding it for at least a year, the gain will be long-term capital gain subject to tax rates of no more than 20%.[44] If the holder sells after holding for a year or less, the gain is ordinary income. Conversely, if interest rates available elsewhere rise, a municipal bond will decline in value and produce a capital loss on sale.[45]

Because capital gains or losses are treated the same for taxable and municipal bonds, a holder who gets his yield entirely from capital gains will tolerate no implicit tax. A holder who sells before the first interest is due will have all of his yield in the form of capital gain and a holder who sells before substantial interest accrues will have substantially all of his yield in the form of capital gain. Thus, an arbitrageur or speculator looking to profit from short-term swings in interest rates, or a hedger looking to protect himself from short-term swings in interest rate, can be expected not to care much whether the interest is taxable or tax exempt, except in so far as exemption in turn affects changes in value. By the time the interest coupons come in, the short-term investor is out of the bond.

If a bond might be sold or held to maturity, the holder will face both a probability that he can tolerate an implicit tax up to the level of his statu-

43. Willcuts v. Bunn, 282 U.S. 216 (1931) (upholding the Constitutionality of taxing capital gain on municipal bonds). Original issue discount is just a means of paying interest, however, and original issue discount on municipal bonds is excluded. I.R.C. §§ 1272(a)(2)(A), 1275(a)(3) (2003).

44. I.R.C. §§ 1(h)(1)(C), (h)(4), 1222(11), (3) (2003) (Taken together, these sections provide for a maximum of 20% rate for gain on capital asset held for more than one year. The 20% maximum applies only to "net adjusted capital gain," from which collectibles and real estate recapture are excluded.).

45. Capital losses are used first against capital gains. For individual holders there is a small, $3000 a year allowance under which net capital losses can be used against unrelated ordinary income, again whether the bond is taxable or a municipal. I.R.C. § 1211 (2003). Capital losses not used against capital gains or within the $3,000 allowance carry over to future years, where they are treated just like capital losses realized in the future year. I.R.C. § 1212 (2003).

tory marginal tax rate (because he will hold to maturity) and a probability that he will tolerate no implicit tax (because he will sell quickly). A holder who in fact sells during the term of the bond would have some fraction of his yield in the form of interest (for which he could tolerate an implicit tax just short of his statutory tax rate) and some fraction in the form of a capital gain or loss (for which he can tolerate no implicit tax). As time goes on and interest comes in, the yield attributable to no-implicit-tax capital gain will shrink in importance relative to the high-acceptable-implicit tax coupon.[46] We need to consider, in any event, whether low implicit taxes might be explained by high expectations of capital gain or losses, for which no implicit tax will be tolerated. Conversely, high implicit taxes might be possible only because volatility in value is expected to be modest, so that capital gains and losses are expected to be modest.

The importance of *unrealized* capital gains and losses does depend on the term of the bonds, and that structure is consistent with the theory that low implicit taxes and expected capital gains are linked. Interest rate changes affect present value of far distant payments far more than of payments closer in time. Table 9 shows the gains on bonds of varying term one year after the bond is issued, when market interest rates drop. The illustration is from a particularly dramatic drop, that is, the drop from 12.7% to 9%, which occurred between the end of 1981 and the end of 1982 on AAA tax-exempt, thirty-year bonds.

| Table 9. Effect of Drop in Interest Rate from 12.7% to 9% (1981-1982) on $100 Bond | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Original Term (in years) | 1 | 3 | 4 | 5 | 10 | 15 | 20 | 30 |
| PV one year later | $100 | $107 | $109 | $112 | $122 | $129 | $133 | $138 |

For any given holding period, longer-term bonds will not only have a larger capital gain than shorter-term bonds, but also a greater portion of their yield reflected in the no-implicit-tax-tolerated capital gain. At one end, if a one-year bond were sold after a year, there would be *no* capital gain because the term expires and leaves no future income to go up in value. At the other end, if the 30-year bond were sold after a year, the total yield would be 12.7% coupon for a year and 38% capital gain for a total of 50.7% yield, and three-quarters of the yield (75%) would be in the form of no-implicit-tax-tolerated capital gain.

Nonetheless, there are a number of difficulties with using the taxation of capital gains to explain implicit tax. The first difficulty is that the capi-

46. If we could find a significant sample of low-risk, AAA bonds that could not be sold but had to be held to maturity, we would expect those bonds to have lower price (and higher yield). The lower price would be some measure of how valuable liquidity—the ability to sell—is to a sample of investors. We would not thereby have a very good measure of the expected value of capital gain, however. "Liquidity" includes the very valuable rights to realize capital loss, to limit losses and to turn wealth into consumable cash. Thus, even if such a sample could be found, it would not be all that valuable for the problem of distinguishing the interest and capital gain component of the expected yield.

tal gains tax discourages sale or realization, such that the relationship of *realized* capital gain can be expected to be inverse to the fraction of *unrealized* capital gain on the bond. Short-term bonds with only a modest proportion of their value in the form of capital gain can be expected to be sold far more often than long-term bonds with high capital gain are sold. Capital gain tax is a toll on changing investments that reduces the capital or principal that the taxpayer has in the replacement investment. To justify a sale to reinvest, the return from the new investment must surpass the return from the original bond by enough to make up the difference.

For example, Table 9 shows the 1981, AAA tax-exempt, 30-year bond with a value of $138, at the new lower 9% interest. If the bond were sold in 1981, the tax would have been 20%[47] times gain of $38, or $7.60 tax per $100 of bond. The investor would thus have only $138 less the tax of $7.60 or $130.40 to invest in the new bond. The investor has to find some investment worth $138, even though he has only $130.40 to invest. If he reinvests in a new ten-year bond, for example, the annual interest will need to be 9.9% per year in an environment in which publicly available bonds are paying only 9%. For shorter-term bonds, where the tax lost is less, the premium required on the new investment is higher than 9%, but not quite so daunting. Table 10 shows what return the replacement investment must make to match the case of no sale, within what is overall a 9% interest rate environment.[48]

Table 10. New Rate of Return Needed to Make up for Loss of Capital by Capital Gains Tax in New 9% Environment (replacement is 10-year bond, coupon only until maturity)

| Original Bond Term (in years) | 3 | 4 | 5 | 10 | 15 | 20 | 30 |
|---|---|---|---|---|---|---|---|
| Compensating Return Rate | 9.21% | 9.26% | 9.34% | 9.58% | 9.73% | 9.81% | 9.91% |

In a perfectly efficient or smart market, there is no reason to think that any replacement investment can do better than the generally available

47. I.R.C. § 1202(a) (1982) provided for exclusion of 60% of long-term capital gain, and I.R.C. § 1 (1982) provided for a maximum tax rate of 50%. 40% * 50% = 20%.

48. Table 10 is calculated first by setting up an equation in which an unknown coupon, $x$ (in dollars), on the replacement bond will make the bond equal to the fair market value of the held bond. For example, the 30-year bond in Table 9 rose in value to $138, produced $38 capital gain on sale, and 20% * $38 or $7.60 tax. Once the $7.60 capital gain was paid, the replacement bond will have a principal and redemption price of $130.40. The present value of coupon and redemption must equal the value of the held bond:

$$\$138 = x * [1 - (1 + d)^{-10} / d] + \$130.40 / (1 + d)^{10}$$

Solving for $x$,

$$x = [\$138 - \$130.40 / (1 + d)^{10}] / * \{d / [1 - (1 + d)^{-10}]\}.$$

Then $x$ is taken as a percentage of the capital available for replacement, that is, $130.40, to calculate a percentage yield shown in Table 10.

It is assumed that the terminal date is 10 years away for all replacement bonds and that the discount rate, $d$, used to compute present value is 9%, the available rate for 30-year AAA tax-exempt at the end of 1982. Assuming replacement bonds of longer than 10 years will compact the differences shown across Table 10.

9% return, because a smart market comes to digest publicly available information almost instantaneously and all investments reach the same return, holding all other things equal including risk and term. That premise leads rationally to a conclusion that capital gains should never be realized for the purpose of reinvestment.[49] Still, if there are exceptions to the smart market, they are more likely to allow sale and replacement of the bond with a small toll charge on it and a return that is just slightly above market. The threshold return required on replacement bonds is higher the longer the term of the original bond. If the realized gains occur on the shorter-term bonds, as the rising threshold in Table 10 would imply, then the term structure of the implicit tax occurs *in spite of* capital gains and not because of it.

There is, however, also value from unrealized appreciation, and unrealized appreciation does follow the pattern consistent with lower implicit tax for bonds with longer terms. Unrealized capital gains are an increase in wealth that allows a rational holder to increase current consumption. Built-in but unrealized gain, first, satisfies some of the cushion or cautionary savings needs, even without sale, so that more of one's current income can be consumed. Rationally, moreover, a taxpayer gets the most value out of resources available to him by averaging resources over his lifetime, and the greater the wealth, the greater the average consumption. In increasing consumption, a rational taxpayer ordinarily just reduces savings from current income before realizing gains, because there is no tax toll on reducing savings, but it was still the extra unrealized gains in wealth that justified the extra consumption. The short-term bonds did not participate in the increase in value in 1981-1982 and thus did not justify added consumption. Unrealized gains will also increase the amount a taxpayer can borrow.

A priori, it is not obvious whether unrealized gains or realized gains can be expected to dominate an investor's motives. Unfortunately, unrealized and realized gains tend to move in opposite directions. Whereas unrealized gains follow a pattern that might mean they are helpful in explaining implicit tax, realized gains can be expected to have a patterm inconsistent with the term structure of implicit tax.

The level of capital gains, in any event, has no apparent connection with the level of implicit tax over time. Chart 9 shows both the implicit tax on 30-year AAA municipal bonds, from 1981-2000, and the capital gain or loss on the same bonds after one year due to changes in interest rates. Chart 9 computes the capital gain or loss on 30-year bonds after one year because capital gains or losses are highest on the longest term bonds and because the proportion of capital gain, relative to coupon, is highest early before significant coupons have been received. Chart 9 presents capital gain as a percentage of the original (assumed $100) bond

49. Calvin H. Johnson, *The Consumption of Capital Gain*, 55 TAX NOTES 957, 964-66 (1992) (discussing the impact of the efficient market thesis on capital gains realized to reinvest).

investment.[50] Capital losses are shown as negative amounts, again as a percentage of original investment. Chart 9 shows the actual results of accrued capital gain and loss, whereas the actual level of implicit tax an investor would tolerate would depend upon anticipated results. The outcome in terms of accrued gain or loss after one year is used here as a proxy for what the investor expects, as if the investor were prescient for one year forward.

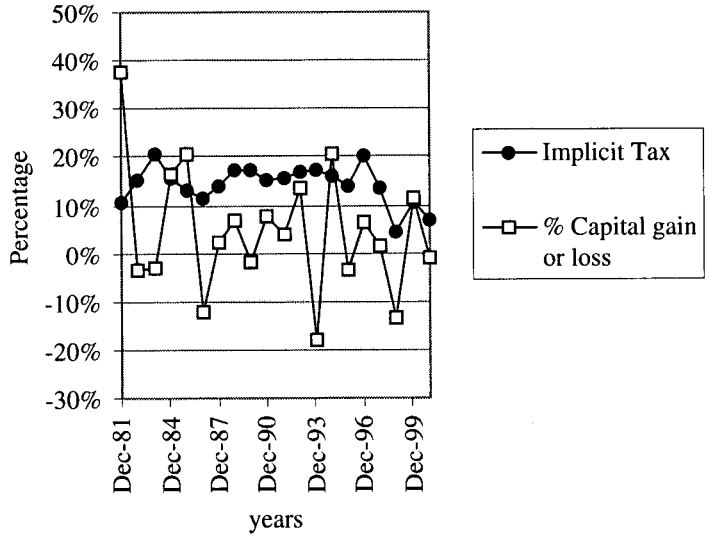


Chart 9

The actual capital gain or loss over time (bottom line of Chart 9) gives no apparent help in explaining the implicit tax (top line of Chart 9) over time. The low implicit taxes under recent conditions are not correlated with an especially high level of capital gains. The highest levels of capital gains in the past are not associated with an especially low level of implicit tax. Expectation of capital gain, accordingly, is not very promising as an explanation for the level of implicit tax.

*4. Increase Demand?*

Given the modesty of the implicit tax, why does anyone pay tax on investment returns? The answer is that, in some sense, frictions and non-tax impediments prevent optimal tax planning in theory from taking place in practice. The explanations as to why positive tax is paid do not quite cover the ground, so that "noise" or "friction" is a filler explanation. Nonetheless there is something to it. There is a pungent maxim for tax that "no finite and feasible system of business taxation can collect

50. Drops in interest rates show up as increases in the present value of the bonds or capital gains. Increase in interest rates show up as decreases in present value. The capital gain or loss is displayed as a percentage of the original $100 value, so that capital losses are negative: (PV bond after one-year minus original $100) / $100.

positive revenues."[51] The maxim implies that the federal government collects tax only because of unexplained frictions.

Some long term investments are already, in effect, tax-exempt investments, even when they appear to be generating ordinary income. Investments in software development, for example, are effectively tax exempt because the investments are made and continued with untaxed capital, but the investments are generating reported taxable income in the 35% maximum corporate tax rate. There is no advantage in giving up one form of tax-exempt investment in favor of another. Qualified pension funds similarly give tax-exempt returns for the same reason that investment capital is untaxed, and qualified pension funds can be expected to generated no implicit tax because the pension fund can buy taxable bonds that have no implicit tax, and still keep the personal privilege of tax exemption. There is again no reason to give up one form of tax exemption to go into another form which is even worse because it bears some implicit tax. Owner-occupied housing is almost totally tax exempt, but given that one can not live in a municipal bond, selling one's house to buy a bond has some non-tax consequences.

With unrestricted borrowing, however, one would not need to give up on alternative investments, whatever their advantages, in order to buy tax-exempt bonds. Except for restrictions on the tax advantages, borrowing allows an exemption available in any sector of the economy to be transported to exempt anything. For example, pretend that § 265(a)(2) of the Code, which denies the deduction of interest on borrowing traced to the purchase or continuation of investments in tax-exempt bonds, did not exist. Absent § 265(a)(2), anyone could avoid tax on income from whatever source derived just by borrowing. For example, a taxpayer with $1 million of salary or any other taxable income would borrow enough to pay $1 million interest and use the amount borrowed to buy tax-exempt bonds. The interest deduction would wash out the taxable income, and the taxpayer would report tax-exempt interest instead. The taxpayer would suffer the implicit tax, which, however, is considerably less than the highest statutory tax rates for long term investments. Only § 265(a)(2) allows the federal government to require its citizens to report taxable income.

Section 265(a) is not leak proof. It is based, in general, on tracing, and a taxpayer can avoid tracing by commingling borrowed proceeds with other cash or by leaving a trail in which equity capital goes into tax-exempt bonds and debt capital replaces equity in some other area.[52] To be

51. Stephen A. Ross, *Comment on the Modigliani-Miller Propositions*, 2 J. ECON. PERSPECTIVES 127, 132 (1988).

52. *See* Rev. Proc. 72-18, 1972-1 C.B. 740 (ruling that § 265(a) disallowance will be applied if borrowed proceeds are used directly to buy municipal bonds, if municipal bonds are used to secure borrowing, but otherwise only if "the totality of facts and circumstances supports a reasonable inference that the purpose to purchase or carry tax exempts exists"). *See* Wisconsin Cheeseman, Inc. v. United States, 388 F.2d 420, 422. (7th Cir. 1968) (denying that a taxpayer's interest expenses were sufficiently directly related to the municipal bonds

fully effective, § 265(a) would need to stack the first interest to the tax-exempt uses under the logic that the interest cost could be avoided if the tax exempts were sold.[53] There is considerably less borrowing to allow municipal bonds than leaky § 265 allows under the smartest of tax planning.[54] Still, § 265 does prevent the quickest ways to avoid tax, that is, by borrowing to buy tax exempts or by borrowing using bonds as collateral where the borrowing can be easily traced to the bonds.

Section 163(d) backs up § 265(a) for noncorporate taxpayers by deferring a deduction for interest incurred to make investments until taxable income comes in from some investment. Section 163(d) allows deduction of interest against the first investment income to come in, from whatever investments the taxpayer has, but does not allow a deduction of interest that shelters salary, explicitly identified as earned income. Section 163(d) allows a negative tax or subsidy, better than mere zero tax, for expensed investments made with borrowed money,[55] but it does prevent interest from sheltering identified salary from tax. For individuals, but not widely-held corporations, the passive activity provisions of § 469 prevent taxpayers from getting the loss deductions that were available before

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to fall under § 265); Ball v. Comm'r, 54 T.C. 1200 (1970) (accord). *See generally* 1 BITTKER & LOKKEN, *supra* note 11, ¶ 31.3 at 31-58. For banks, since 1986, the interest is allocated between municipal bonds and other assets according to the relative basis of the bonds and other assets. Rev. Rul. 90-44, 1990-1 C.B. 54.

53. *See* I.R.C. § 263A(f)(2)(A)(ii) (2002) (determining amount of interest that is capitalized as part of basis of a major construction project by allocating to the project interest that could have been avoided if the project had not been undertaken).

54. Rev. Proc. 72-18, 1972-1 C.B. 740, § 3.05, for example, gives a safe harbor for municipal bonds of less than 2% of a corporation's assets and that 2% can be a very big number. MERLE ERICKSON ET AL., HOW PREVALENT IS TAX ARBITRAGE? EVIDENCE FROM THE MARKET FOR MUNICIPAL BONDS (Nat'l Bureau of Econ. Research, Working Paper No. 9105, 2002), documents a very big shortfall under which firms use arbitraging far less than allowed by the 2% threshold.

55. The correct remedy in lieu of § 163(d) is to disallow all interest deduction (or include borrowing in income). Assume, for example, an investment of $100, which will return $100 * $(1 + 10\%)^2$ or $121.00 in two years in absence of tax. If a taxpayer ("TP") had borrowed for the investment at 10% interest in absence of tax, there would be no cost at the start, but no net profit at the end.

Assume that the investment is treated as an expense, for instance, by § 174 (immediate expense for research and development investments). TP, in the 40% bracket, can therefore invest $100 / (1 - 40%) or $166.67 and get reimbursement by tax savings of 40% * 166.67 for a net cost of $201.67, which is reduced by 40% tax on the whole to $121. The $166.67 grows in two years to $166.67 * (1 + 10%) to $201.67 to $121. The combination of tax reimbursement from expensing and taxation of the return have left TP with $100 in and $121 out and the same 10% return and cash flows as was the case in absence of tax.

Now assume TP borrows $100 at 10% interest, but invests the same $166.67 counting on the $66.67 reimbursement by tax savings. TP has no cash flow cost at the start. In two years, however, the TP has $201.67 gross profit. TP repays the loan together with $21 interest, which § 163(d) allows as a deduction at that point. Tax on $180.67 net income at 40% is $72.27, leaving the TP with net return after tax and loan repayment of $201.67 – $72.27 – $121 or $8.40. The $8.40 is the value of deducting $21, allowed by § 163(d). The $8.40 return makes a break even investment that can just pay off the bank, in absence of tax, into a profitable return after tax. The return is better after tax than the 10% before tax, because the investment can pay off the 10% interest and still return a profit. Deferring interest was not an adequate remedy to ensure neutrality because it left tax subsidy beyond tax exemption for what may be a very unmeritorious investment.

1986 by reason of borrowing.[56] Section 469 does a pretty fair job of preventing the sheltering of salary, dividend, and interest income from portfolio investments borrowing.

Corporations are not subject to either §§ 469 or 163(d), which are the reasonably effective anti-borrowing remedies, but there are some non-tax restrictions on corporations that have some effect. For example, the deduction of software or advertising investments means the effective tax rate on those investments is zero, but software and advertising are expenses immediately for non-tax accounting as well as for tax. A corporation that borrowed $1 billion to make software investments or advertising would be left with no assets on the left side of the balance sheet and $1 billion in liabilities, for a net worth of negative $1 billion. For wise investments in software or advertising, the negative $1 billion net worth would be nondescriptive accounting, but apparently it impedes borrowing in the corporate culture nonetheless. The inability to borrow means that the corporation will report positive taxable income when the return from the investment comes in, even though the tax has not reduced the pretax return rate.

There have been suggestions that the implicit tax on municipal bonds might be increased by facilitating debt investments in municipal bonds.[57] In the simple five-person island model that started this paper, for example, Max might be allowed to borrow $400,000 from lower tax bracket investors and take up the entire supply of bonds offered to the island. Max would pay and deduct 10% taxable interest on debt used to buy and carry the tax-exempt bonds. Since the after-tax cost of deductible interest to Max is only $6,000 in his 40% tax bracket, Max could let tax-exempt interest drop to $6,000 and the implicit tax rise to almost his 40% statutory tax. The high implicit tax rate would make the subsidy delivery efficient and take away Max's extra middleman profit. Section 265(a)(2), denying the deduction of interest expense traced to tax-exempt bond income, is thus said to be responsible for the failure of the implicit tax to rise to the highest statutory tax rate. Without the restrictions on interest deductions, it is argued, the over-supply of tax-exempt offerings would be absorbed by unlimited borrowing by maximum tax bracket citizens alone. The implicit tax is so modest because supply swamps demand, but it is impossible, a priori, to identify whether it is the too-large supply or a too-small demand that explains the imbalance.

The difficulty with repeal of § 265 and other actions that would expand demand for municipal bonds is that they increase the cost of a bad program, encourage its expansion, and strip the tax base of its best sources of revenue. Increasing the implicit tax to equal maximum statutory tax rates would take away the middleman profit, but the beneficiary of the increase would be state and local borrowing. The increase in implicit tax

56. *See, e.g.*, Calvin H. Johnson, *What's a Tax Shelter?*, 68 TAX NOTES 879 (1995).

57. *See, e.g.*, Theodore Sims, *Debt, Accelerated Depreciation and the Tale of a Teakettle: Tax Shelter Abuse Reconsidered*, 42 UCLA L. REV. 263, 315-16 (1994).

would lower state and city borrowing costs and increase state and city incentive to undertake inferior capital projects, shift projects from the private to the public sector, and shift current state and city expenses off onto future generations of taxpayers.[58]

Without some limitation on the supply of municipal bonds, the quantity of bonds offered could expand elastically to meet and even swamp any demand expansion. Every lower government, for example, should rationally defer taxes and pay for expenses out of borrowing. That would allow its taxpayer constituents to invest to pay future taxes. The issuer's cost would be the tax-exempt rate. The benefit would be the constituency's return on its investment. Every taxpayer would get at least the tax-exempt rate, and may have access to a higher rate of return if their tax bracket is low or other non-tax factors allow a citizen access to a better after-tax return. The constituents would pay more taxes, augmented by the tax-exempt borrowing rate, but get a higher return in their own hands from which to pay the extra taxes. State and local borrowing improves the wealth of the citizenry until the default risks of the borrowing raise the cost of borrowing by enough to take away the tax-caused advantage. The phenomenon is much like the tax-induced profits of arbitrage bonds, confronted by § 148,[59] except that the greater-than-municipal-bond-return investment can be made by the constituents rather than the local issuer, thus avoiding § 148 altogether. Legal arbitraging of this nature means that the supply of municipal bonds can be expected to swamp any demand.

Any expansion of § 103 by allowing debt financing would not be a free good. Every dollar eligible for § 103 represents a dollar that the tax system could capture as part of the revenue base and an expanded § 103 would make disappear from the federal tax base. The combination of exemption and an interest deduction, moreover, would strip the tax base of the income from those taxpayers best able to pay. Compensation coming into the highest bracket and luxury consumption from use of that money is now generally subject to tax.[60] The combination of interest-expense deduction and yield exemption, however, would shelter that income from tax. The taxable income that would disappear with the expansion of municipal bonds is the source judged by the tax-rate schedules to be best able to bear tax: luxury consumption and consumed compensa-

58. For conservative criticisms of the distorting effect of tax advantaged investment, see, e.g., Patric H. Hendershott, *Analysis of the Impact of Capital-Specific Policies or Legislation: Application to Reforms of the Tax-Exempt Market*, 12 J. MONEY, CREDIT & BANKING 377 (1980); MICHAEL L. MUSSA & ROGER C. KORMENDI, THE TAXATION OF MUNICIPAL BONDS 190 (1979).

59. STAFF OF J. COMM. ON TAX'N, GENERAL EXPLANATION OF THE TAX REFORM ACT OF 1986, at 1154-56 (explaining the reason for the enactment on restrictions on arbitraging).

60. I.R.C. § 1014 (step-up in basis at death) gives heirs an ample source of untaxed consumption, and § 163(h) (tax deduction for mortgage interest) gives individuals access to tax-exempt housing use, even without capital. The taxation of the consumption value from fringe benefits is not complete. Still, consumption is *generally* taxed.

tion of the highest-bracket taxpayers. When that source is sheltered out, federal revenue will have to come from inferior sources.

Repairs to the implicit tax have to focus on limiting the supply of municipal bonds, rather than expanding the demand, and benefiting the federal revenue by keeping its base strong rather than by increasing the subsidy for state and local government borrowing.

## D. REMEDIES

The modest implicit tax on long-term municipal bonds, currently under 10%, has implications on municipal bonds and implications as to the tax base as a whole.

### *1. Cutting Back the Supply of Municipal Bonds*

The low implicit rates imply that that the supply of municipal bonds needs to be cut back to the level where it can be fully digested by purchase by investors facing the maximum tax rate. Assume, for example, the maximum tax rate is 40%. The implicit tax would then rise to be 40% of prevailing interest rates.

A direct way to make municipal bonds more efficient is to amend § 103 to prohibit it from applying to any bond-paying interest of more than 60% of taxable rates of the same risk and term. To be effective, interest would have to be defined to include original issue discount, which would require information about what the issuer received upon issuance and prohibitions on rebates. Matching risk would in fact require some work, but perhaps the best way to avoid the administrative burdens of the match would be to allow interest of no more than, say, 65% of applicable federal interest rates of the same term, thereby ending tax-exempt bonds that the market perceives to be of high risk. The requirement would, of course, mean there would be no further issuance of tax exempts until the volume of outstanding bonds dropped to the point where only the 40%-tax-bracket investor would buy up all the outstanding bonds.

When the bond quantity drops so that some new issues would find room in the market even with the maximum allowable interest, there would be a continuing need to ration the supply. The most rational way to cut back the supply is for the Treasury to auction the right to issue tax-exempt bonds with bids allowed only from the governmental entities now permitted to issue such bonds. The Treasury would limit the aggregate national supply to that level that could be expected to be fully digested by the highest bracket and require as well that interest paid could only be 65% of applicable federal rates. The winners of the auction would be those entities that have a capital project that can pass the highest hurdles. The new implicit tax, offset by the bid the city pays, would leave a successful city with as large a benefit as they receive from the modest implicit tax under current conditions, but the Treasury would capture the loss now going to infra-marginal investors (Max, Middle, and Modest in

the Table 3 example). The Treasury's gain would allow it to reduce the levels of other distortionary taxes.

Given the term structure of the implicit tax, the first bonds successfully offered would be short-term bonds. For long-term bonds, investors have alternative ways to avoid tax, and they do not accept much implicit tax on tax-exempt bonds.

For long-term bonds, perhaps those with a term of over twenty years, an alternative remedy is for the Treasury to buy back the tax-exempt privilege, or at least pay states and municipalities a bounty that might only partially compensate them for issuing taxable bonds. The modesty of the implicit tax on long-term bonds allows room for both the Treasury and state and local governments to come out ahead with respect to long-term borrowing now. With implicit taxes on long-term bonds at under 10%, the Treasury could make state and local issuers of long-term bonds better off with a 10% subsidy given to state and local borrowers who will issue taxable bonds. The low implicit taxes imply that the marginal investor has opportunities to pay effective tax rates of just over the implicit tax for the next best tax-advantaged investment, but infra-marginal investors would in fact pay more than that in tax to the Treasury on their alternative investments. The inefficiency of municipal bonds means that there are many infra-marginal investors. Neither a 10% subsidy for municipal borrowing nor a large implicit tax for the benefit of municipal borrowing is a justified use of federal funds in a first-best world, but the remedies are just better than § 103.

The modesty of the implicit tax also puts a sharp filter on simplification within the municipal bond program. Only those simplification programs that curtail the volume of issued bonds are acceptable. Simplication proposals that would increase the volume of issued bonds are unacceptable.[61]

### 2. *Use of the Tax System for Incentives Generally*

More generally, the modesty of the implicit tax means that there is a need for general repairs of the federal tax base. The demand for tax avoidance that would settle the implicit tax at the top statutory rate is swamped, not just by § 103 bonds, but by other investments that Congress has attempted to subsidize by giving or preserving a tax advantage. Congress, for instance, gives or expands the tax benefits of qualified pension funds or houses, and thousands of other things, by giving tax deductions that do not reflect economic cost or by giving exclusions for economic benefits.

With implicit tax so low, however, the use of the tax system for incentive or subsidy is no longer responsible. The loss to the system in cost is far higher than the benefit delivered on site. With implicit tax on long-

61. For a list of current proposals that would increase volume of outstanding bonds, see Nat'l Ass'n of Bond Law., *Tax Simplification Recommendations to Treasury on Tax-Exempt Bonds*, 96 TAX NOTES 965 (2002).

term bonds under 10%, too little of the cost of exemption is delivered on the site of the target to accomplish the good. While the implicit tax signals such sorry health, Congress needs to dedicate the definition of taxable income to describe the taxpayer's economic position, so as to leave the tax system as a level playing field, devoid of subsidy intent.

It is also time for Congress to replicate the strategy of the Tax Reform Act of 1986. The Tax Reform Act of 1986 was a compromise between strange bedfellows, one half of the alliance seeking to reduce stated tax rates and the other half seeking to strengthen the tax base for the taxes that remained. The Act ended tax shelters as they were understood at the time and reduced both corporate and individual rates. Both in cutting the rates and eradicating shelters, the Act improved economic efficiency. It is time to do it again. The low implicit taxes indicate that the existing rates are fictive, or at least voluntary, for well-advised taxpayers. If they faced more than a paper tiger from the tax system, generally they would pay higher implicit tax. Reducing the rates and repairing the tax base would reduce the harm inflicted by the tax system.