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AN EMPIRICAL EXAMINATION OF MUNICIPAL FINANCIAL POLICY

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ABSTRACT

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The purpose of this paper is to examine empirically the financial policy of municipalities in four states (Connecticut, Maine, Massachusetts and Rhode Island) to see to what degree these municipalities attempt to take advantage of each of the available opportunities to engage in tax arbitrage. Our data comes from the 1980 U.S. Census of Population and Housing, and the 1977 U.S. Census of Governments. We find clear evidence that communities do actively engage in such tax arbitrage.

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The organization of the paper is as follows. In section I, we explore in more detail the tax incentives affecting municipal financial policy, and then discuss other factors which may also influence financial decisions. In section II, we describe the construction of the data set used in the empirical study, and present tables summarizing the general characteristics of municipal financial policy. In section III, we present and discuss the results of our

regression analyses investigating the role of the various factors affecting municipal financial policy. Finally, in section IV, we comment briefly on the implications of our results for the distributional and efficiency effects of the current tax treatment of municipal financial policy.

I. Factors affecting municipal financial decisions.

A. Tax Factors

1. Base Case

Based on a simplified view of the current tax law, individuals when investing as individuals face a nominal before-tax interest rate of r and an after-tax rate of $r(1-t)$,[1] where t is their marginal personal income tax rate. Assume that all residents in a community face the same marginal tax rate, that their marginal tax rate will remain constant over time, and that any prospective home buyer in the community will have the same tax rate. (Assume also that if they currently itemize deductions, then they and any buyers will also itemize in the future.)

If an individual's community buys securities, the community can earn a before and after tax return of r, while the community can borrow at a tax-exempt interest rate, which we denote by r_m. By construction let $r_m = r(1-t_m)$. Due to its tax-exempt status, r_m has historically been approximately 70% of the value of r.[2]

Differences between

(1) the community's borrowing rate, r_m,

(2) the community's lending rate, r, and

(3) the residents' borrowing and lending rate, $r(1-t)$,

create a variety of arbitrage opportunities whereby the community/residents can borrow at a low rate and lend at a higher rate. Three different forms of arbitrage are possible given the three different pairwise differences in the above borrowing and lending rates.

In the first and simplest form of arbitrage, comparing rates of return (1) and (2), the community can borrow a dollar through the municipal bond market, and invest it in taxable securities, receiving on net $r-r_m=t_m r$. The IRS has been concerned about this form of arbitrage, and in 1969 a section was added to the Internal Revenue Code which attempted to restrict severely the extent of such arbitrage. Specifically, section 103(c) of the Internal Revenue Code states that interest on municipal debt is taxable if a major portion of a debt issue is used directly or indirectly to buy securities earning a materially higher rate of return. Proceeds from a debt issue can be invested temporarily in taxable securities, however, and by statute up to fifteen percent can remain invested for extended periods, as a reserve or replacement fund. The IRS has not been very aggressive in enforcing this statute. Only in 1979 did it rule that a community which has large holdings of taxable securities relative to its outstanding debt is in violation of section 103(c) per se, even if the debt were issued for a clearly different purpose. The interpretation of the statute was less clear in 1977, the year our data were collected. In addition, the IRS has recently allowed communities to borrow in order to invest in taxable securities if the purpose is to raise their bond rating. We will assume for now, however, that the IRS does enforce the statute, so communities are permitted to invest only n percent of any debt issue in taxable securities, and that all communities puruse this arbitrage to the legal limit. Evidence on the extent to which communities engage in this arbitrage is presented below.

A second form of arbitrage available to communities, comparing rates of return (2) and (3), is to raise property taxes now, invest the proceeds in taxable bonds, then use the proceeds from the bonds to lower property taxes in the future. By investing indirectly through the community, individuals earn a rate of return on their investment of r, rather than the rate of return of r(1-t) available when they invest direclty. When they invest an extra dollar

through the community, residents gain $r-r(1-t)=rt$ each year in arbitrage profits.[3] The IRS has not attempted to restrict this second form of arbitrage.

In the third and final form of arbitrage, comparing rates of return (1) and (3), communities/residents attempt to take advantage of the difference between r_m and $r(1-t)$. Wealthier be individuals, for whom $r(1-t)<r_m$, will want to borrow as individuals and buy tax-exempt securities. In this situation, their municipality plays no role. Individuals in lower tax brackets, however, for whom $r(1-t)>r_m$, cannot borrow as individuals at the tax-exempt rate in order to invest at $r(1-t)$ -- only municipalities can borrow at the tax-exempt rate. But these individuals can have their municipality borrow for them at rate r_m, then use what is borrowed to lower property taxes. The residents can then invest what they save in property taxes and earn a rate of return of $r(1-t)$. On net they gain $r(1-t)-r_m$ in arbitrage profits.[4] However, communities are allowed by statute to invest a fraction of what they borrow in taxable securities. Given this, the net gain to residents each year per dollar borrowed becomes

$$(1-n)(r(1-t)-r_m)+n(r-r_m) = r(t_m)-(1-n)t). \qquad (1)$$

For many communities, the last two forms of arbitrage (raise property taxes and invest in bonds earning r, or lower property taxes and borrow at rate r_m) can simultaneously be worthwhile. However, if both are pursued the community is in effect borrowing at r_m and investing at r, the policy which is restricted by the IRS. Each community must therefore choose to pursue either one policy or the other. Which is preferable? That depends first on the relative gain per dollar change in current property taxes, and second on how aggressively one policy versus the other can be pursued and what offsetting costs are incurred when doing so.

If the community chooses to lower taxes and borrow, what limits the amount

of such tax arbitrage that it can undertake? One potential limit is that states set statutory limits on how much municipalities can borrow. Generally, the statutes specify that the outstanding debt in a municipality cannot exceed some per cent of the assessed property value of the community.[5] Commonly, separate limits are set for school bonds and for debt of special districts, so that creating special districts allows more debt to be issued. In addition, some forms of debt are normally entirely exempt from these limits, and states often provide a mechanism to relax a binding restriction on debt issues. It therefore seems unlikely that a community would face such a binding limit.

Similarly, states often allow debt to be issued for only certain purposes, e.g. capital expenditures and short-run cash flow needs. These restrictions set some upper limit on debt issues, though communities should have some flexibility in broadening the definition of "capital expenditures" when the restriciton is binding. Aggregate data, however, suggest that this constraint is not close to binding on average. For example, Peterson (1978) and Peterson (1981) report the per cent of state and local capital expenditures financed by long term bonds, by federal aid, and by other local resources for selected years between 1952 and 1977. In these figures, long term debt issues never exceeded 56% of total capital outlays, and never exceeded 65.4% of non-federal expenditures on capital outlays. (The average figures were 42.7% and 55.8% respectively.) Unfortunately, it was not possible to test explicitly whether such a constraint was close to binding in any of the towns in our sample.[6]

Some other nonstatutory factor seems to limit the extent to which communities issue debt. One possible factor limiting the amount of borrowing by a community is risk aversion on the part of residents. The real value of the outstanding municipal debt is random, depending on interest rate fluctuations and inflation. Since the relative interest rates on municipal bonds and taxable bonds change substantially over time, as shown in Poterba (1984), borrowing in

the municipal market and investing in the taxable market is by no means a fully hedged investment. Risk aversion would limit the size of municipal debt relative to the individual's total wealth, everything else equal.

Alternatively, the same set of factors appealed to in discussion of corporate financial policy,[7] agency costs and bankruptcy costs, could also play a role in limiting the amount of municipal debt. The only implicit security that lenders have is the tax base of the community, so they would be increasingly reluctant to lend as the outstanding debt grows relative to this tax base.[8] In summary, agency costs and risk aversion each provide an explanation for why municipal debt cannot become too large relative to the municipal property tax base, or the total wealth, of the community.

Related factors presumably limit the extent to which residents will invest their wealth through the community. Accounting standards in communities would normally be viewed as lax compared with those of mutual funds, so residents may well fear that municipal employees could divert surplus funds into excess expenditures on municipal services, or invest it poorly. The more money that is invested in the community, presumably the more difficult it would be to guard against such behavior. In addition, the risk individuals face on such investments includes not only the risk in the return on the securities, but also the risk in the value of their property relative to the total tax base of the community, and the risk that any buyer may not adequately take into account the value of the asset being purchased with the house. Individuals would become increasingly risk averse at the margin as more of their wealth depends on the value of their house.

The benefits from pursuing one or the other arbitrage strategies vary with the tax rate of the residents -- the gain from investing through the community, rt, grows with t, whereas the gain from borrowing through the community, $r(t_m-(1-\pi)t)$, falls with t. In contrast, the offsetting costs limiting the

extent of such arbitrage should not depend directly on the tax rate of the residents. We would therefore expect communities with low tax rates to favor issuing municipal bonds, while wealthy communities would prefer to invest through their community. These are two of the principal relationships we will look for in the empirical analysis.

2. Complicating factors

In the above discussion, we assumed that the after-tax rate of return to savings for the individual was r(1-t), and ignored the individual's portfolio problem. However, if individuals can exchange taxable and tax exempt bonds freely and without constraint, they will do so until they are indifferent at the margin to owning one or the other. For example, at this point the cost of bearing the extra risk in the return on municipal bonds just offsets any gain in expected return. In this situation, as residents they would be indifferent between having the community borrow in the municipal bond market or raising taxes (assuming n=0). Wealthier individuals (those facing a $t>t_m$) will normally be in just this situation, investing in taxable and tax exempt securities until indifferent.[9] They would then find the riskier return on municipal bonds just equivalent to the return r(1-t), implying that the gain from having the community borrow an extra dollar, as expressed in equation (1), simplifies to nrt. Poorer individuals, in contrast, cannot sell municipal bonds short as individuals and invest the proceeds in taxable bonds, given existing institutions. Instead, they have their community borrow for them on the municipal market, just as described previously. In summary, the gain to residents from an extra dollar of municipal debt would now equal $\max(t_m-(1-n)t, nt)r$.

The above discussion also focussed on a situation where residents do not itemize. If residents do itemize, then any property tax payment costs residents only (1-t) per cent of the tax payment. Therefore, everything else equal, lenders can hope to collect 1/(1-t) times as much from residents when residents

itemize, so would view 1/(1-t) dollars of debt from a community where residents itemize as equivalent in risk to one dollar of debt from a community of non-itemizers. As a result, both the costs of issuing an extra dollar of debt and the benefits of issuing an extra dollar (see footnote 3) are reduced by (1-t) per cent when residents itemize. Communities where residents itemize should therefore undertake the same amount of tax arbitrage as communities where residents do not itemize, everything else equal, but in doing so would issue 1/(1-t) times as much debt.

This argument assumes that if residents itemize deductions in one year, then they itemize in all years. If not, then individuals face an incentive to shift tax payments towards those years in which they itemize, when the payments are tax deductible. Most new homeowners itemize, but as time passes owners would eventually become increasingly unlikely to itemize. Therefore, new owners would face a strong incentive to pay as much as possible in property taxes while they itemize, so ought to avoid having their municipality borrow (and would prefer having it build up a reserve). Similarly, during the years in which the individual does itemize, he would prefer to push his property tax payments towards the years in which his personal income tax rate is highest. Furthermore, an individual who is no longer itemizing, and who is expecting to sell his house in the near future to someone who will be itemizing, would much prefer to keep property taxes as low as possible now and have the municipality go into debt. The buyer can deduct the cost of repaying this debt, and will therefore reduce his bid for the property by only (1-t) per cent of the value of the outstanding debt. The gain to the seller from lowering taxes is the full reduction in taxes, since he does not itemize, and losing (1-t) per cent of the gain through the sale price of his house is an attractive exchange. By the same argument, an individual in this situation would be reluctant to build up assets in the community.

B. Nontax factors

1. Lumpiness of capital expenditures.

Conventional wisdom says that lumpy expenditure are more likely to be financed with debt, because it is difficult to adjust property tax rates enough to cover extraordinary capital expenditures. However, this factor does not necessarily imply high debt on average, as communities could build up assets in anticipation of heavy expenditures, and pay off any debt quite quickly. Most large expenditures, e.g., school buildings, are easily anticipated, making this process straightforward. Also, for large communities, any given lumpy capital expenditure would not be so large relative to the total budget, making it easier to pay for the expenditure over a short period of time. There seems to be little reason to expect in the data a strong association between the level of debt and the size of the community's capital stock.

2. Burden on current versus future residents.

Conventional wisdom also says that bond finance of capital projects and tax finance of current expenditures is more equitable, because under this system payments and benefits coincide in time. If the housing stock is unchanging, however, any difference in timing of payments and benefits ought to be capitalized in house prices, thus leaving incentives on financial policy unaffected. What current residents avoid paying now through use of debt they end up paying through reduced property values. This is true as long as buyers and sellers are in the same tax bracket, and buyers correctly perceive the fiscal position of the community.

However, new buyers may well misperceive the financial position of the community. For example, buyers are likely to take the property tax rate into account, but may presume the taxes finance constant real expenditures, whereas debt service involves constant nominal expenditures (ignoring refinancing). This consideration leads to a preference for tax finance. On the other hand,

keeping the current tax rate low through debt finance may lead buyers to underestimate future tax bills.

If the housing stock is not fixed, then use of debt finance allows more of the cost of current expenditures to be pushed onto property used for new construction. When a house is built, that property becomes a larger share of the property tax base of the community, and so pays a larger share of the property taxes. When taxes are used to finance current expenditures, each property pays based on its current share of the total property tax base. However, when debt finance is used, each property pays based on its share of the property tax base over the next twenty years or so. If a new house is built on a property during that time, then that property pays a larger share of the original expenditures if debt finance is used rather than tax finance.

A community would not necessarily want to increase the tax burden on newly built houses, however. If this tax burden already exceeds the marginal cost of public services to new residents,[10] and if the amount of new construction is sensitive to the property tax rate, then shifting taxes further onto new residents may not be desirable.

3. Heterogeneity of the community.

In the previous section, we made the obviously unrealistic assumption that the community was entirely homogeneous. Modelling the political decision making of a heterogeneous community is complicated, however. The median voter model is often used, and we will appeal to it below in the empirical work, but its characterization of the decision-making process is very naive. The more heterogeneous the community, the less we would expect our tax story, as applied to the median income voter, to fit the data. Similarly, when relative prices of houses within the community are changing, there is a clear conflict of interest about financial policy, with uncertain outcome.

4. Transactions costs of bond issues.

When municipal bonds are marketed, buyers seek information about the riskiness of the bonds. For large communities, rating services and brokerage houses will collect and provide such information. For smaller communities, however, available information would be much less reliable. As a result, buyers would not be able to differentiate between safe and risky issues, and thus price them the same, encouraging risky issues and discouraging safe ones, the classic "lemons" problem. Whether or not the market breaks down completely, we would expect our theory to apply much less well to smaller communities.

5. Rental units.

Renters favor debt finance if there is rent control with a property tax pass through. If a project is financed by a property tax increase, then a tenant under rent control must pay the full cost immediately. However, if debt finance is used, rental payments each year would go up only slightly. If the tenant expects to move before the debt is fully repaid, then debt finance is clearly preferable.

If market rents are unconstrained, however, then the equilibrium rent is affected by municipal financial policy only through the preferences of landlords -- the demand curve for apartments is unaffected by how expenditures are financed, but the supply curve would be affected. Landlords would normally be in high tax brackets, so prefer that the community avoid debt and attempt to build up a reserve of taxable securities. Renter-voters may not perceive these incentives, however.

II. Characteristics of the data set.

In order to investigate the importance of the various factors affecting municipal financial policy, we have assembled what we believe to be a unique set of data. Our data source on government financial policy was the Finance Summary Statistics from the 1977 Census of Governments. This tape provided information for all state and local government units on their revenues and expenditures,

plus the book value of various categories of financial assets and liabilities that they held. Our data source on the characteristics of the residents of each community was the 1980 Census of Population and Housing,[11] Summary Tape File 3C. This tape reported a variety of characteristics of the population and the housing stock for all "minor civil divisions" (MCD's) with at least 10,000 population in eleven states, and all counties and "places" with at least 10,000 population.

Unfortunately, the two data sets were not easily matched. To begin with, the identification codes for each observation on the two tapes had no relation. Fortunately, the Census kindly created for us a third tape which matched these identification codes wherever possible. In addition, however, many "places" are not contiguous with any unit of government, while many units of government (e.g., school districts) do not coincide with a "place" or an MCD, the unit of observation on the Census of Population and Housing tape. By necessity, our study had to be confined either to MCD's and those places which coincided with units of government, or to counties. Our judgment was that the population of each county would be very heterogeneous, and the variation in average characteristics across counties would be too small to allow much to be learned from county data. Our study therefore focusses on data for MCD's and places.

In many states, however, school districts and special districts are very important, and these districts can issue debt in their own right. Residents should not care whether debt is issued by their municipality or by their special district -- they are liable either way -- so how much debt is issued by MCD's versus special districts should be arbitrary. But matched data is available only on MCD's.

In order to avoid the problem of arbitrary division of financial responsibility, we focussed on four states where only a small fraction of the short-term debt and full-faith-and-credit long term debt was issued by units of

government other than MCD's -- Connecticut (5%), Maine (32%), Massachusetts (20%), and Rhode Island (1%).[12] Within these states there were 276 usable observations.[13]

For each community, we constructed a measure of its outstanding debt. This figure was defined to equal the book value at the end of the year of short-term debt plus long-term general obligation debt, minus any holdings of state and local bonds. We made no attempt to estimate the market value of the outstanding debt, given the reported book values. Our presumption was that since all data came from the same calendar year, the ratio of market value to book value should be very similar for all communities.[14]

We did not include in our measure of debt the amount of revenue bonds or other nonguaranteed bonds that each community had outstanding. Such bonds are not legal liabilities of the municipal government, and are not paid for out of property tax revenues.

We next constructed a measure for each community of the book value at the end of the year of its holdings of Federal securities and other bonds, notes, mortgages, and financial assets, excluding state and local government securities. A critical issue in constructing this measure was the proper treatment of cash and deposits held in "sinking funds, bond funds, or other non-insurance funds." Such deposits could be held primarily for liquidity purposes soon after bonds are issued or soon before bonds are retired. If they earn less than the interest due on the bonds, as would checking accounts and perhaps savings accounts, then there is no arbitrage reason to borrow to put the proceeds in cash and deposits. However, deposits might also be held in money market funds or certificates of deposit, and earn a return well above that on municipal bonds. In order to compare the typical rate of return earned on cash and deposits with that earned on other taxable securities, we regressed total interest income divided by the par value of all security holdings (I/S) against

a constant and the fraction of total security holdings held in cash and deposits (CD/S). The results were as follows (standard errors are in parentheses):

$$(I/S) = \underset{(.011)}{.045} + \underset{(.013)}{.015}\ (CD/S).$$

The estimated rate of return on cash and deposits is 6% per year, almost exactly the interest rate of 5.94% earned in one year Treasury notes of 1977, and higher than the estimated 4.5% earned on other taxable securities.[15] In most of the results reported below, we therefore included cash and deposits in our measure of taxable security holdings.

We also ignored any assets held in the various insurance and pension funds. It is possible that communities choose to borrow to overfund their insurance and pension funds, contributing more now and less later and earning a market return tax free in the interim.[16] Unfortunately, we had no information about the extent of overfunding in our data set, so did not pursue this.[17]

From the Census of Population and Housing we attempted to construct a measure of the median marginal personal income tax rate of residents in each community. The tape reports the median family income in each community. We then assigned to each family income the average marginal personal income tax rate observed for that income level in the N.B.E.R. TAXSIM file for 1980.[18]

We did not have any data on average wealth or average property values of residents in each community, as an indicator of the tax capacity of the community. As a proxy, we used the total income of all residents in the community.

We also had no information on the percentage of the residents in a community who itemized. By the theory, communities where the median voter itemizes would want to issue $1/(1-t)$ times as much debt as communities where the median voter did not itemize. In most of the results reported on below, we made no attempt to control for differences across communities in the probability that

the median voter itemizes. As we present the results, we will discuss what biases are likely to be present, given this omission.

Tables 1-4 present various summary characteristics of the financial policy of communities in our sample. In each table, we have divided our communities into six marginal tax rate categories, with the average marginal tax rates of the categories ranging from 23.4% to 35.0%. Table 1 reports the average of the ratios within each category of the book value of outstanding municipal bonds divided by the total income of the community. It reports these figures for the entire sample, for large communities (population over 25,000), for small communities (population under 25,000), for relatively homogeneous communities, and for relatively heterogeneous communities.[19] Based on the tax arbitrage arguments of the previous section, we would expect the ratios to decline with the marginal tax rate and to decline more dramatically for large communities. Both of these expectations are borne out unambiguously in the data. Higher tax rate communities do still borrow, but much less so relative to their aggregate income than do lower tax rate communities. In small communities, there is no clear pattern to the figures. The theory has no clear predictions about the differences between homogenous and heterogeneous communities. Here we find that the ratios tend to decline in both cases.

The observed degree to which debt/income is lower in rich communities should underestimate the responsiveness of debt policy to tax incentives, since the median voter would be likely to itemize only in the richer communities. In such richer communities, we should observe $1/(1-t)$ times as much debt as they would choose to accept if they did not itemize. Had we been able to control for the effects of itemization, the pattern observed in Table 1 should have been much stronger.

Table 2 reports similar figures for several other measures of the financial position of these communities. The first and second lines report the average

ratio of debt to municipal tax revenues for the total sample and for large communities. The theory suggested nothing directly about these ratios, though they do show a similar but weaker pattern than the figures in Table 1. The next four lines describe the average ratio of federal and other securities held, excluding or including cash and deposits, divided by total income of the community. If communities all prefer to borrow through the municipality rather than invest in a tax free way, then these figures should all be a uniform fraction of the corresponding figures on the first two lines of Table 1. The average of the actual fractions, calculated using the cash inclusive definition of Federal securities, is reported on lines 7 and 8 for all and for large communities. For large communities, we do find that security holdings increase with marginal tax rate, as the theory forecasts.

Table 3 is designed to provide information about the size of the tax savings achieved through tax arbitrage within each marginal tax rate category. The simplest form of arbitrage is to borrow at the municipal rate and invest at the taxable rate, gaining rt_m per year per dollar borrowed. The first line reports the average of $\min(D,S)/Y$ as a measure of how much of this arbitrage is occurring, where D represents debt, S represents security holdings, inclusive of cash and deposits, and Y represents total income of the community. The second form of arbitrage is to borrow and use the proceeds to lower taxes, saving residents $\max(t_m-t,0)r$ per year.[20] In the second line of the table we report the average value of $\max(D-S,0)/Y$, as a measure of the extent of this second arbitrage. Finally, communities might also raise property taxes and invest in securities tax free, saving rt per dollar invested. The third line of the table reports the average ratio of $\max(S-D,0)/Y$ as a measure of this third form of arbitrage. By the theory, we would expect wealthier communities to favor this third form of arbitrage.

In order to approximate the average tax savings from municipal financial

arbitrage within each marginal tax rate category, we require data on r and t_m. For r, we used .076, the average nominal rate on twenty year government bonds in 1977.[21] There was no compelling reason for choosing this rate rather than many alternatives, and all figures would simply change proportionately if another rate were chosen. Choosing a value for t_m is more important. If we simply compare the interest rates on municipal and taxable bonds in 1977, we find an implicit tax rate of 32% comparing 20 year prime municipals with 20 year new issue Aa industrials, and 51% comparing one year prime municipals with one year governments. But none of these comparisons control for risk, call provisions, etc. Gordon-Malkiel (1981) report a comparison of interest rates on taxable bonds and tax exempt industrial revenue bonds issued simultaneously in 1978 by the same firm with similar provisions. In this sample, t_m is estimated to be only 22.5%. Given this dispersion of estimates, we calculated the tax savings for each marginal tax rate category for both t_m=.225 and t_m=.35. These estimates equal:

$$r/Y[\max(t_m-t,0)\cdot\max(D-S,0)+t_m\cdot\min(D,S)+t\cdot\max(S-D,0)]$$

The resulting figures for t_m=.225 are reported on the fourth line and for t_m=.35 on the fifth line. Tax benefits are larger for poorer communities, particularly when t_m=.35 -- poor communities gain more from borrowing and do more of it than do rich communities, whereas rich communities do little to take advantage of the opportunity to invest tax free through their community. The reported figures represent the tax savings before taking account of itemization. Those communities where residents itemize, predominantly the richer communities, save only (1-t) times the reported figures given that the payments would have been tax deductible, so that the reported figures understate the degree of which poor communities gain relative to rich communities. For all communities,

however, the tax savings are extremely small.

One question raised by the figures in the tables is whether communities do in practice borrow and establish substantial holdings of taxable securities, in spite of IRS rules attempting to limit it. In order to examine this, we calculated the distribution of S/D, and report this distribution in Table 4, defining S to be either exclusive or inclusive of cash and deposits. Here we find that with the exclusive definition of S, over ten percent of the communities hold taxable securities amounting to more than twenty per cent of the book value of their debt, and six communities have invested more in taxable securities than they have borrowed. This evidence is not necessarily inconsistent with strict IRS enforcement of section 103(c) -- these outlier communities could recently have had large issues of bonds, the proceeds from which had not yet been spent. However, using the cash inclusive definition of securities, most communities have far more securities than the IRS rules would seem to allow. This phenomenon is not restricted to the four states we focus on. In all municipalities in the U.S., municipal security holdings were 37.5% of municipal debt.

III. Analysis of the data.

In the previous section, we compared the financial policies of communities with residents having different marginal income tax rates. In doing so, however, we made no attempt to control for other factors which also might affect financial policy. In this section, we construct measures of a few other factors which ought to influence financial policy, and then regress various measures of municipal financial policy against these factors as well as the marginal tax rate of the residents of the community, to see to what degree the association found above between a community's marginal tax rate and its financial policy might be caused by other factors.

In the discussion of tax incentives in section I, we argued that if individuals itemize, if they itemize in some years but not in others, if they face

different tax rates among the years in which they itemize, or if they intend to sell their house in the near future and the likely buyer faces a different tax rate or itemizes while the seller does not, then strong tax incentives exist to change municipal financial policy. No information is available which directly measures the frequency of occurrence of any of these circumstances. Instead, we picked a variety of indicators from the Census of Population and Housing.

The most direct indicator of the likelihood that the median voter of the community itemizes is the median income of residents. From the N.B.E.R. TAXSIM file, we know the per cent of taxpayers who itemize (PI) at each income level. If communities segregate by itemization status as well as by income, then in this per cent of the communities of a given income level the median resident will itemize. IF the median resident does itemize, then the community ought to be observed with $1/(1-t)$ times as much debt, everything else equal, or equivalently be observed with the fraction $t/(1-t)$ more debt. Therefore, if communities do segregate by itemization status, then, everything else equal, the expected debt/income ratio for a community would be changed by the factor $(1 + tPI/(1-t))$ due to the effects of itemization.

The simplest indicator of changing itemization status over time is just the age distribution of the residents. Younger residents are more likely to itemize. Since they are less likely to be itemizing when they are older, they would wish to pay as much as they can in taxes while they are young when proerpty tax payments are tax deductible. Older residents are less likely to itemize and more likely to expect to sell shortly. As a result, they may either want to borrow now, since a buyer will likely itemize to be able to deduct the payment, or avoid borrowing now, since the buyer might misperceive a high property tax as representing a fixed real rather than a fixed nominal burden. The particular summary measures of the age distribution that we chose were: 1) the per cent of the adult (over age 25) population that was younger than age 45 (%

young), and 2) the per cent of the adult population over age 60 (% old).

The Census also contained several direct indicators of the past mobility of residents currently living in the town. High mobility among owners indicates that residents are more likely to be itemizing, having recently acquired a mortgage so prefer to pay for expenditures now while the tax payments are tax deductible. It also indicates that an existing resident will more likely sell his house in the near future, and prefer more debt if the buyer is itemizing and in a higher tax bracket. The particular indiators that we used were: 1) the per ent of housing units in which the current occupant moved in within the last five years (HMOVE), and 2) the per cent of residents who lived in a different county five years earlier (CMOVE).

In the first section, we also argued that renters would prefer debt finance if they are covered by rent control, but perhaps ought to prefer tax finance otherwise. The Census did report the per cent of housing units which were rented (% rent). Unfortunately we knew nothing about whether rent control existed in any given community.

If new housing units are being built in town, part of the burden of current expenditures can be pushed onto new housing units with debt finance, but not with tax finance. The particular measure of community growth we used was the per cent of existing housing units built within the last five years (HNEW).

Since state regulations can potentially limit (or at least influence) how much debt municipalities within the state do issue, we included separate constant terms in the regression for each state. Based on the severity of the state regulations reported in footnote 5, we would expect municipalities in Connecticut to have the most debt, and those in Rhode island to have the least. However, the direction of causation may not be clear -- the size of the state's limits may well just reflect common practice among the state's municipalities.

Finally, in some regressions reported below, we also included as a

regressor the ratio of municipal expenditures to aggregate income (E/Y). Based on the arguments in the first section, there would be no reason to expect any causal relation between debt and expenditures. However, if the tax-exempt status of interest on municipal bonds is serving as a subsidy to municipal expenditures, then it must be true that communities which spend more are able as a result to borrow more. Finding an association between debt and expenditures in the data, after controlling for other factors, would at least suggest that spending more allows a community to borrow more, implying that the ability to issue tax-exempt bonds provides some subsidy to municipal expenditures. (Since it is commonly argued that this tax-exemption specifically subsidizes capital expenditures, it would have been preferable to try as an additional variable the value of the municipal capital stock divided by income. No data were available on the municipal capital stock, however.)

Our basic measures of the financial position of a community were 1) total debt outstanding divided by total income, (D/Y), and 2) debt net of security holdings (measured inclusive of cash and deposits) divided by income (D-S)/Y). We tried a variety of regression specifications, reported in Tables 5-7, in order to test the robustness of the association we found previously between a community's financial policy and the marginal income tax rate of its median resident. In the first, we simply regressed each of our two measures of a community's financial policy against the list of indicators described above (ignoring the itemization factor), and the marginal tax rate of the median resident of the community. Since the tax incentive to issue debt is proportional to $\max(t_m-t,0)$, however, we expected that the effects of the marginal tax rate would be nonlinear, with variation in t mattering most when $t<t_m$. We therefore created two tax rate variables, $t_L = \min(t,.27)$ and $t_H = \max(t-.27,0)$, thereby allowing the marginal effect of changes in t to differ depending on whether t is less than or greater than 0.27.[22] Our expectation was that the effect of each

tax rate variable on municipal debt holdings would be negative, but that t_H would be much less important.

These regression results are reported in Tables 5 and 6, using either dependent variable, and estimated over either all communities or only large communities. In Table 5, we omit (E/Y), while we include it in Table 6.

In every case, the coefficients of the marginal tax rate variables have the signs and patterns forecast from the theory -- forecasted gross and net debt declines with marginal tax rate, and more quickly when the tax rate is low than when it is high. The results show no clear difference in the degree to which communities invest in securities. If all communities invested in securities just up to the allowed IRS limit, then the forecasted values of (D-S)/Y should be proportional to those for D/Y, with a proportionality factor of about 0.80. The coefficients on the tax rate variables in Table 5 do tend to be proportionately smaller, though only by about 12%, when (D-S)/Y is the dependent variable. However, the tax coefficients in Table 6 tend to be larger when (D-S)/Y is the dependent variable, suggesting some tendency for wealthier communities to invest more in securities.

The estimated magnitude of the effects of the tax rate are substantial, particularly in Table 5. For example, if we forecast using the estimated coefficients how much more debt relative to income a large community would have if its tax rate equals 0.35 rather than 0.234, the difference in tax rates between the highest and the lowest of the six groups examined previously, we forecast a difference in D/Y of 0.126 using the coefficients in Table 5 and 0.069 using the coefficients in Table 6. In comparison, when we estimated this difference previously in the second line of Table 1, not controlling for anything else, we found a difference of 0.076. This implies that our previous results did not arise from a failure to control for other observable factors.

Comparing the results in Tables 5 and 6, we find that including (E/Y) makes

a large difference. It does appear that communities are able to borrow more if they spend more,[23] even though the theory in section I suggested no clear reason why additional spending should cause the community to incur additional debt. (In fact, one might argue that additional spending would make the community a less attractive risk to a lender, since the extra spending would be a competing demand on the tax base.)

If this observed association between spending and debt is interpreted to be causal, then we conclude that spending is made cheaper because of a community's ability to issue tax-exempt debt. How large a subsidy to spending is implied by these estimates? The difficulty in answering this question is that in the data we are comparing the stock of debt with an annual flow of expenditures. In order to interpret the results, let us assume that half of new debt issues are short term (one year), and half are long term (twenty years), and let us assume that all debt is repaid when it matures.[24] Assume also that d% of expenditures each year are financed by debt, and assume expenditures have been growing in nominal terms at g% each year. Between 1957 and 1977, nominal state and local expenditures grew at 9.6% per year, so let us approximate g by .096. Then at any point in time, the stock of debt outstanding would equal $.5(dE + \int_0^{20} dEe^{-gs}ds)$ where E equals the current level of expenditures and s indexes years. Our regression coefficients imply that large communities which spend a dollar more have as a result $0.68 more debt outstanding, so that the total current debt arising from past expenditures should equal (0.68)E. Equating the two expressions and solving for d, assuming g = 0.096, we find that d = 0.1375; that is, each extra dollar of spending allows a community to issue 0.1375 dollars of extra debt.

When a community issues a dollar of tax exempt debt for twenty years, the cost of making payments on the debt, assuming that $t<t_m$, equals $\int_0^{20} r_m e^{-r(1-t)s}ds + e^{-20r(1-t)}$. If t = 0.234 (the value for the poorest of our

six groups), if $t_m = 0.35$, and if $r = 0.076$, then this expression equals 0.90 -- the tax-exempt status lowers the cost of the long term debt by 10%. Similarly, when debt is issued for one year, given the same procedure and parameter values, the debt is cheaper by 0.86% (approximately $r(1-t)-r_m$) because of its tax-exempt status. Given our assumption that half of the debt issued is short term and half is long term, the average savings from issuing debt are 5.43% of the value of the debt issued. Since, by our calculations, a dollar of extra expenditures results in only 0.1375 dollars of extra debt, the cost of this dollar expenditure is reduced by only $0.0543 \cdot 0.1375 = 0.0075$ dollars as a result of the tax-exempt status of the debt, a trivial 0.75% subsidy rate for this low-income community. For wealthy communities, for whom $t>t_m$, there would be no reduction in the cost of extra expenditures. Our results therefore suggest that this tax exemption should have virtually no effect on the cost of municipal expenditures.

Among the other coefficients reported in Tables 5 and 6, most tend to be small and insignificant. In many cases, the forecasts from the theory were also ambiguous. The coefficients do indicate the following: 1) Middle-aged communities tend to have the most debt, while younger communities have slightly less debt and older communities have much less debt. This pattern seems to be more consistent with the life cycle pattern of spending on local public services, some fraction of which is debt financed, than with the tax arbitrage arguments of section I. 2) Mobile communities tend to avoid debt, as expected. 3) Connecticut communities tend to have slightly more debt, as expected, though there are no clear differences among the other states.

The results reported in Tables 5 and 6 suffer from the problem that the dependent variable is deflated by income, and in addition three independent variables, E/Y and the two tax rate variables, are constructed using income information. If the reported income figures do not measure the correct theoretical concept without error, as is inevitable, then the previous coefficient

estimates are somewhat biased.

We felt that the indirect correlation with the residual would be greatest for (E/Y), so we reran the previous regressions with instrumental variables, using as instruments all the independent variables except for (E/Y), plus (E/population), $(E/population)^2$, and the fraction of the population of school age. The results were almost identical to those reported in Tables 5 and 6.

Any bias due to correlation of the tax variables with the residuals should be slight -- the tax variables are constructed using median family income, and the correlation of this with total income of the community should be small. To attempt to control for any bias, however, instrumental variables did not seem worthwhile -- there seemed to be no good instruments for marginal tax rates. Instad, we tried deflating the dependent variable by tax revenues rather than income. Tax revenues is probably less highly correlated than is income with property values, the deflator argued for in section I, but the correlation should still be high. In addition, with this specification we test whether communities simply rely proportionately on debt finance vs. tax finance when funding expenditures.

The resulting coefficient estimates are reported in Table 7.[25] We have omitted (expenditures/ revenues) from these regressions, as its variation reflects intergovernmental transfers as well as interest payments on existing debt, factors which are either irrelevant or endogenous. Since the mean value of the dependent variable is approximately ten times as large as that of D/Y, the coefficient estimates are also much larger. However, all previous patterns in the coefficients remain present, particularly for large communities. For example, the forecasted difference in the dependent variable between communities with $t = 0.234$ and $t = 0.350$ is 0.307, forecasting using the coefficients of the full sample, and 0.844, using the sample of large towns. In comparison, the differences reported in Table 2 for these two cases were 0.231 and 0.272,

respectively. While the statistical fit is somewhat poorer when D/R is the dependent variable, the qualitative results reported previously continue to be present -- our previous findings do note seem to arise from a simple statistical bias.

Another bias caused by the multiple roles of income arises from the fact that residents in higher income communities are more likely to itemize, and communities where residents itemize, by our theory, should have 1/(1-t) times as much debt. Since primarily rich communities itemize, had we controlled for the effects of itemization, the estimated effects of taxes should have been yet stronger. To estimate how sensitive our results are to the effects of itemization, we reran the previous regressions for large communities after multiplying all right-hand side variables, including the constant, by the factor $(1 + tPI/(1-t))$. As expected, the coefficients on the tax variables were larger, though not dramatically so. The other coefficient estimates were similar to those reported previously. Since our proxy for whether a community itemizes is far from perfect, these results should be interpreted with caution.

IV. Conclusions

On theoretical grounds, we argued that poorer communities face much stronger incentives to issue municipal bonds than do wealthier communities, and our empirical work showed that poor communities do in fact borrow a great deal more. In contrast, wealthier communities should face an incentive to invest through their community and so avoid tax on income from savings, yet we foundin the data only limited evidence of such a pattern. Apparently municipal employees are not trusted as investment managers.

What then do we conclude about the distributional and efficiency effects of these tax incentives faced by municipalities? In section II, we calculated the tax savings to residents resulting from municipal financial policy, and found that the poorest communities gained the most relative to their income, though

for all communities the tax savings, as a per cent of income, were extremely small. Of course, the wealthy gain substantially as purchasers, rather than issuers, of municipal bonds, and this gain to the wealthy, as purchasers of tax-exempt bonds, should be the dominant distributional effect of the provision making these bonds tax-exempt. Those in the middle of the income distribution are left with little gain from either side of the market.

Communities undertake only a limited amount of such tax arbitrage because there are some offsetting costs, due perhaps to costs of risk bearing and agency and bankruptcy costs. These offsetting costs, which are real costs, are one component of the efficiency cost of the tax-exempt status of municipal bonds. At the margin, in equilibrium, these costs must be as large as any extra tax savings. In aggregate, these costs must be smaller, though, else no arbitrage would occur. How much smaller is not clear. For a detailed simulation study of the efficiency and distributional effects of the tax exempt status of interest on municipal bonds, see Gordon-Slemrod (1983).

One justification commonly given for the tax exempt status of interest on municipal bonds is to subsidize municipal expenditures. Yet, according to our estimates, any reduction in the cost of municipal expenditures arising from the tax-exempt status of municipal bonds, is trivial. The justification for tax-exempt bonds must be sought elsewhere.

FOOTNOTES

*We would like to thank Harvey Brazer for extensive comments on an earlier draft, and William Shobe for very able assistance with the empirical work. The work on this paper was begun while Gordon was employed at AT&T Bell Laboratories, and completed while Slemrod was a National Fellow at the Hoover Institution of Stanford University. The opinions expressed in this paper are those of the authors, and not necessarily those of the N.B.E.R., AT&T Bell Laboratories, or Hoover Institution.

1. We implicitly assume that individuals can borrow and lend freely at a before tax interest rate of r, pay tax on any extra interest earnings (e.g., do not save at the margin in an IRA), and itemize if they borrow. If individuals face a higher opportunity cost of funds, due for example to binding borrowing constraints, then the discussion in the text would need to be modified in a straightforward way.
2. See, for example, Poterba (1984).
3. If the individual itemizes, then the accounting of this cash flow is identical to that for an IRA. Given itemization, a property tax increase of $(1//1-t)) costs the individual $1 net of income taxes. After a year, the community owns $(1+r)/(1-t) in assets. When it lowers property taxes by this amount, the individual saves (1+r) net of income taxes, given the deductibility of property tax payments. Since the dollar, if invested directly, would have been worth (1+r(1-t)), the net gain to investing a dollar in the community equals (1+r)-(1+r(1-t)) = rt.

FOOTNOTES CONTINUED

4. These incentives have also been described in Adams (1977) and Gordon-Slemrod (1983). If residents itemize, the story would be modified slightly, as in footnote 3. The community would borrow $(1/(1-t)), saving residents $1, given the deductibility of property taxes, which they can then invest at an interest rate r(1-t). When the municipal debt is repaid, the individual must pay $(1+r_m)/(1-t)$ extra in property taxes, but at a cost net of income taxes of $(1+r_m)$. Arbitrage profits are still $r(1-t)-r_m$, but now on municipal borrowing of $(1/(1-t)).

5. For example, in the states we examine below the limits are as follows. In Maine, each municipality may issue debt up to 7.5% of assessed value, school districts may borrow up to 12.5% of assessed value, and special districts and other government entities face their own debt ceilings. In Massachusetts, cities can borrow up to 2.5% of assessed value, towns up to 5%, and fire, water, light, and improvement districts up to 5%; however the first two limits can be doubled with permission from the state. In Rhode Island, municipalities can borrow up to 3% of assessed value, but excluded from this limit are housing authority, public building authority, and various other bonds; the state can authorize towns to exceed these limits. Connecticut, in contrast, restricts general obligation debt to 2.25 times the latest tax receipts, though makes certain types of debt exempt from these limits. The limits can also be increased for certain purposes, such as school building projects or urban renewal. For further discussion, see Starner (1961), or A.C.I.R. (1974).

FOOTNOTES CONTINUED

6. The problem was that the reported figures for long term debt issues in 1977 in our sample included a sizable amount of revenue bonds, used to finance such activites as utilities, pollution control, hospitals, single family housing, industrial aid, etc. In aggregate in 1977, Peterson (1978) reports that total debt issues, including revenue bonds, equalled 118.7% of local capital outlays, and the figures in our sample were not much different. Revenue bonds, however, are with rare exceptions not legal liabilities of the municipality, and are repaid out of mortgage payments, rental income, or other user fees. The municipality, when issuing revenue bonds, is merely acting as a conduit for funds for some other quasi-public or private organization, and not providing any tax arbitrage for residents. Unfortunately, we have no figures on issues of general obligation debt.
7. For an overview of these various factors, see Gordon (1982).
8. As in the discussion of corporate financial policy, further debt issues would raise the probability of default, leading to higher anticipated real expenditures by both lenders and the community when negotiating a settlement.
9. IRS rules do not allow interest on debt to be deducted if the funds are borrowed to buy tax exempt securities. However, if an individual borrows for another purpose, interest is deductible even if municipal bonds are simulaneously held. In most cases, an individual should be able to avoid

FOOTNOTES CONTINUED

9 (continued). this IRS rule. If the IRS rule is binding, however, then the risk adjusted value of r_m would exceed r(1-t), and individuals in this situation would prefer to avoid municipal borrowing.

10. This could occur if the community has imposed tight zoning restrictions on new construction.

11. While the dates of the two censuses were three years apart, we felt that this gap was small enough to ignore.

12. With more time, we might have expanded the sample further to include New York (26%), New Hampshire (30%), and perhaps Wisconsin (40%).

13. Three towns were eliminated for which the reported figures were estimated by the Census rather than reported by the town.

14. Measurement error should be less, however, for growing communities, where debt would have been issued more recently.

15. This figure is the return on book value rather than market value, so its low value probably just reflects the fact that the bonds tend to be old.

16. For a description of these incentives, focussing on corporate plans, see Black (1980) and Tepper (1981).

17. Inman and Seidman (1980), however, find that local government pensions tend to be underfunded.

18. We would like to thank Daniel Feenberg for calculating these figures for us.

19. A community was defined to be homogeneous if at least 24% of its families had an income within 20% of the median income.

FOOTNOTES CONTINUED

20. Residents do presumably bear some offsetting costs, however, such as risk and agency costs. Unless state restrictions on borrowing are binding, in equilibrium the marginal increase in these costs as more debt is issued would just equal the extra taxes saved. Average costs would be substantially less than average tax savings, however.
21. The interest rate data used in this paragraph come from the Salomon Brothers Center, An Analytical Record of Yields and Yield Spreads.
22. The break point of 0.27 was chosen because it provided a reasonable estimate of t_m, and because it divided the sample approximately in half.
23. Other explanations for the statistical association are possible, however. For example, communities with large amounts of commercial and industrial property can both spend more and find it attractive to borrow more -- lenders would have the commercial and industrial tax base as additional collateral.
24. The results are very insensitive to these assumptions about the maturity structure of the debt.
25. Asefa, Adams, and Starleaf (1981) report similar regression results. Specifically, on a sample of 660 large towns taken from the 1972 and 1967 Censuses, they regressed (change in the book value of nominal debt between 1967 and 1972)/(estimated total expenditures) against median income, capital expenditures as a fraction of total expenditures, % old, HMOVE, percent growth rate in population, and a few other variables. They also

FOOTNOTES CONTINUED

25 (continued). found a negative effect of median income, and in addition found that a dollar of extra capital expenditure was associated with $0.314 of extra debt issues. However, changes in debt, the focus of their work, need have only a very weak connection with the equilibrium level of debt holdings, the focus of our paper. Communities may mostly finance large capital expenditures initially with debt in order to avoid large fluctuations in their property tax rates, but may differ substantially in how quickly they pay back the debt or the degree to which they build up reserves in anticipation of upcoming expenditures. Their coefficient estimates also ought to be unstable across time periods, since the dependent variable, changes in nominal debt, is strongly affected by the inflation rate and the age distribution of the debt.

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TABLE 1

Municipal Debt as a Percent of Municipal Income

	Sample	Range of Marginal Income Tax Rates					
		.210-.245	.245-.257	.257-.275	.275-.293	.293-.325	.325+
1.	All	7.9	7.3	6.9	6.7	6.3	4.0
2.	Large towns	10.7	8.7	6.8	7.2	3.7	3.1
3.	Small towns	5.2	6.1	7.0	6.4	6.8	4.3
4.	Homogeneous towns	4.5	7.8	6.9	6.4	7.0	5.4
5.	Heterogeneous towns	10.2	6.6	7.0	7.4	4.8	3.0

TABLE 2

Alternative Measures of Financial Position

Definition/Sample	Range of Marginal Income Tax Rates					
	.210-.245	.245-.257	.257-.275	.275-.293	.293-.325	.325+
Debt/Revenues						
1. All	71.4	74.1	73.5	74.1	69.8	48.3
2. Large towns	64.3	80.7	69.6	76.0	51.0	37.1
Securities/Income without deposits						
3. All	0.54	0.46	0.87	0.45	0.28	0.35
4. Large towns	0.88	0.96	1.07	0.41	0.26	0.41
with deposits						
5. All	2.8	2.5	2.8	1.9	2.3	2.0
6. Large towns	3.0	3.4	2.9	2.0	2.1	1.7
Securities/Debt with deposits						
7. All	65.8	60.6	49.1	40.7	54.2	64.7
8. Large	32.4	43.9	42.6	46.2	79.2	87.5

Note: All figures are reported as percentages rather than as fractions.

TABLE 3

Extent of Various Forms of Tax Arbitrage

Definition	Range of Marginal Income Tax Rates					
	.210-.245	.245-.257	.257-.275	.275-.293	.293-.325	.325+
1. min(D,S)/Y	2.7	2.3	2.3	1.8	2.2	1.7
2. max(D-S,0)/Y	5.2	5.1	4.6	4.9	4.1	2.3
3. max(S-D,0)/Y	0.14	0.26	0.48	0.12	0.08	0.27
Tax savings/Y						
4. t_m = .225	0.049	0.044	0.049	0.033	0.039	0.036
5. t_m = .35	0.120	0.105	0.101	0.075	0.074	0.052

Note: The definition of securities includes cash and deposits. All figures are reported as per cents, rather than as fractions.

TABLE 4

Taxable Securities Held as a Percent of Municipal Debt:
Distribution Across Communities

	Percentile Range						
Definition	0	0-.1	.1-.2	.2-.3	.3-.4	.4-.5	>.5
Securities/Debt							
1. Without deposits	60.9	23.6	4.7	2.2	0.4	2.9	5.4
2. With deposits	0.4	8.3	22.8	18.5	11.2	8.3	30.4

TABLE 5

Regression Results
(Expenditures/Income Omitted)

Dependent Variable/Sample

Independent Variable	D/Y	(D-S)/Y	D/Y	(D-S)/Y
	All towns		Large towns	
1. Constant	0.43 (0.13)	0.42 (0.13)	0.84 (0.20)	0.87 (0.25)
2. t_L	-0.93 (0.30)	-0.80 (0.32)	-2.32 (0.45)	-2.12 (0.59)
3. t_H	-0.26 (0.14)	-0.23 (0.15)	-0.53 (0.27)	-0.45 (0.36)
4. % young	-0.04 (0.13)	-0.12 (0.14)	-0.07 (0.23)	-0.21 (0.31)
5. % old	-0.28 (0.13)	-0.35 (0.14)	-0.42 (0.22)	-0.56 (0.29)
6. CMOVE	-0.07 (0.04)	-0.07 (0.04)	-0.02 (0.08)	-0.01 (0.10)
7. HMOVE	-0.11 (0.10)	-0.05 (0.11)	-0.06 (0.19)	-0.03 (0.25)
8. % rent	0.09 (0.05)	0.06 (0.05)	-0.02 (0.08)	-0.02 (0.11)
9. HNEW	0.02 (0.10)	0.00 (0.10)	-0.04 (0.20)	-0.05 (0.26)
10. Conn.	0.02 (0.01)	0.01 (0.01)	0.04 (0.02)	0.02 (0.02)
11. Maine	-0.02 (0.01)	-0.02 (0.01)	-0.00 (0.03)	0.00 (0.04)
12. Mass.	-0.00 (0.01)	-0.01 (0.01)	0.03 (0.01)	0.02 (0.02)
Standard Error of the Regression	0.041	0.043	0.038	0.050
R^2	0.205	0.145	0.422	0.241

Note: Standard Errors are in parentheses under the coefficients.

TABLE 6

Regression Results
(Expenditures/Incomes Included)

Independent Variable	Dependent Variable/Sample: D/Y (All towns)	(D-S)/Y (All towns)	D/Y (Large towns)	(D-S)/Y (Large towns)
1. Constant	0.18 (0.12)	0.24 (0.13)	0.38 (0.19)	0.56 (0.27)
2. t_L	-0.35 (0.28)	-0.39 (0.32)	-0.86 (0.47)	-1.16 (0.69)
3. t_H	-0.15 (0.13)	-0.15 (0.15)	-0.47 (0.24)	-0.41 (0.35)
4. % young	0.02 (0.12)	-0.08 (0.14)	-0.05 (0.20)	-0.20 (0.30)
5. % old	-0.15 (0.12)	-0.25 (0.14)	-0.33 (0.19)	-0.50 (0.28)
6. CMOVE	-0.02 (0.04)	-0.03 (0.04)	0.03 (0.07)	0.03 (0.10)
7. HMOVE	-0.17 (0.09)	-0.09 (0.11)	-0.17 (0.17)	-0.10 (0.25)
8. % rent	0.08 (0.04)	0.06 (0.05)	0.03 (0.07)	0.07 (0.11)
9. HNEW	0.12 (0.09)	0.08 (0.10)	0.15 (0.17)	0.07 (0.26)
10. Conn.	0.02 (0.09)	0.01 (0.01)	0.03 (0.01)	0.01 (0.02)
11. Maine	-0.01 (0.01)	-0.01 (0.01)	0.01 (0.03)	0.01 (0.04)
12. Mass.	-0.02 (0.01)	-0.02 (0.01)	0.00 (0.01)	0.00 (0.02)
13. E/Y	0.57 (0.07)	0.40 (0.08)	0.68 (0.12)	0.45 (0.18)
Standard Error of the Regression	0.037	0.042	0.033	0.049
R^2	0.357	0.570	0.219	0.290

TABLE 7

Debt/Revenue Regressions

Independent Variables	Dependent Variable/Sample			
	D/R	(D-S)/R	D/R	(D-S)/R
	All towns		Large towns	
1. Constant	2.6 (1.6)	2.9 (1.5)	4.5 (1.7)	5.9 (2.5)
2. t_L	-1.2 (3.8)	-2.3 (3.6)	-8.1 (3.9)	-10.5 (5.7)
3. t_H	-3.3 (1.8)	-2.8 (1.7)	-6.9 (2.3)	-6.3 (3.4)
4. % young	-1.4 (1.7)	-1.7 (1.6)	-1.0 (2.0)	-2.2 (3.0)
5. % old	-3.1 (1.7)	-3.5 (1.6)	-3.4 (1.9)	-4.7 (2.8)
6. CMOVE	-0.4 (0.5)	-0.4 (0.5)	0.1 (0.7)	0.5 (1.0)
7. HMOVE	-0.9 (1.3)	-0.5 (1.2)	-0.6 (1.6)	-0.7 (2.4)
8. % rent	1.0 (0.6)	0.7 (0.5)	-0.4 (0.7)	-0.4 (1.1)
9. HNEW	1.7 (1.2)	1.3 (1.1)	0.4 (1.7)	-0.0 (2.5)
10. Conn.	0.2 (0.2)	0.1 (0.1)	0.3 (0.1)	0.1 (0.2)
11. Maine	-0.2 (0.2)	-0.1 (0.2)	0.1 (0.2)	0.1 (0.4)
12. Mass.	-0.2 (0.1)	-0.2 (0.1)	0.1 (0.1)	0.0 (0.2)
Standard Error of the Regression	0.512	0.78	0.324	0.482
R^2	0.154	0.144	0.276	0.120