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5 Federal Deductibility of State and Local Taxes: A Test of Public Choice by Representative Government

Lawrence B. Lindsey

5.1 Introduction

The recent tax reform debate focused attention on the continued deductibility of state and local taxes in the calculation of federal taxable income. The original tax reform proposal by the Department of Treasury, issued in November 1984, called for the complete elimination of deductibility of state and local taxes. Later proposals by the president, the House of Representatives, and the Senate, maintained deductibility of nearly all state and local taxes. The final product of the tax reform debate, the Tax Reform Act of 1986, maintained deductibility of all state and local taxes except for retail sales taxes.

The deductibility of state and local taxes is a significant feature of fiscal federalism. Had deductibility of personal state and local taxes—retail sales, personal income, and residential property taxes—been eliminated in 1983, federal income taxes would have been $30.4 billion higher. By contrast, total federal grants-in-aid to state and local governments were $86.2 billion that year.

Unlike the direct grants-in-aid, the income tax saving from deductibility does not accrue directly to state and local governments. Instead, it is received by individual taxpayers in the form of lower income tax liability. This is likely to affect state and local tax collections in two ways. First, local taxpayers have higher disposable income as a result of deductibility. If state and local public services are normal goods,

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this higher disposable income will lead to greater demand for such spending. Second, federal deductibility lowers the net cost to itemizing taxpayers of incremental dollars of state and local tax collections. This lower price on incremental public spending may also increase the quantity of public services demanded.

Academic investigation of this issue has properly focused on the "price" effect. The entire tax saving from state and local tax deductibility amounted to 1.25 percent of disposable personal income in 1983. On the other hand, deductibility lowered the price of incremental taxation for itemizers to 69 cents per dollar collected. Given these results, even modest price elasticities and large income elasticities are likely to show that price effects are dominant. This paper therefore follows the existing academic literature in focusing on price effects.

Unlike ordinary price changes, changes in the price of local taxation do not translate directly through consumer optimization into changes in the equilibrium quantity of services demanded. The quantity and type of taxes and services are not determined by individual consumers but by collective decision-making apparatuses. The elasticity of demand for public services therefore depends on the mechanism by which price changes are translated into changes in public policy.

The dominant model of converting individual preferences into collective actions has been the median voter model, first proposed by Hotelling (1929) and formally developed by Bowen (1943). In this model, the collective decision reflects the preferences of the swing or median voter. Half of the remaining voters are assumed to want more of the given commodity, half less. A change in the price of local taxation for some voters will only affect the outcome if the price facing the median voter is changed, or if the ranking of voters is changed in a way so that the median voter becomes someone new.

The median voter model places enormous stress on the capacity of representative governments to reflect voter preferences accurately. Rules controlling the election process, the setting of the legislative agenda, and the process of coalition formation may well produce a different outcome than that preferred by a majority of the voters.

The present paper tests a number of different modes of public choice, focusing on the subject of state and local tax deductibility. Three issues are considered: the effect of deductibility on the level of state and local taxation, the effect of deductibility on the type of tax used at the state and local level, and the effect of proposed changes of federal tax rules regarding deductibility on congressional voting on tax reform. On each issue, a number of different methods for translating individual taxpayer preferences into collective decisions are tested.

Section 5.2 below describes the theoretical issues involved and reports on academic findings to date. Section 5.3 describes the data used

in this analysis, and discusses its appropriateness to the issues at hand. The following section produces the results of the tests of various types of models of translating individual preferences into collective actions. The paper concludes with a brief summary of the findings.

5.2 Theoretical Issues and Academic Findings

Most academic investigations of the price elasticity of demand for locally provided public services have relied on the geographic variability of the cost of public good provision, and the variations in the demographic makeup of communities. There are two major explanations for this emphasis. The obvious reason is that the available data permit such a construct. The second reason is a theoretical one: the reliance on the median voter model of public choice.

Many communities rely on the sequential referendum method of budgeting for local public goods, particularly education. Such referenda generally begin with a high proposed level of spending and reduce the figure in subsequent referenda until the budget proposal passes. This voting procedure lends itself nicely both to empirical testing and to the theoretical attraction of the median voter model.

In practice, the median voter model requires a far more restrictive set of assumptions. The first is that there be a single public good in question so that logrolling and coalition formation do not dominate the voting procedure. This condition is arguably present in those referenda systems where the local public good in question is typically education. However, Bergstrom and Goodman (1973) lay out an extremely rigorous set of assumptions needed to establish the result of a referendum as representative of the preferences of the median voter in the community. These include restrictive assumptions on the income distribution in the community and the price and income elasticities of demand for housing—a necessary condition where local public spending is financed by taxation of residential real estate.

Even laying aside the theoretical problems of establishing median voter criteria, there are a number of practical problems with the model. The first is the problem of agenda setting. If sequential referenda are not guaranteed, or if the change in the amount of taxation in each referendum is substantial rather than marginal, it may be that the preferences of the median voter will not be realized. Romer and Rosenthal (1978) argued that the tendency for spending to revert to some substantially lower level if a referendum were defeated would lead voters who prefer a modestly lower amount of spending than that proposed to support the referendum. They argued that this procedure would produce a higher level of spending than that supported by the median voter.

The process of voting is also not free, especially given the time commitment necessary for the sequential referendum process. Work by Rubinfeld (1980) tested for differences between voters and nonvoters. An earlier paper by Rubinfeld (1977) found that renters were less likely to vote than were homeowners. A high price of voting puts constraints on the sequential referendum process, and will produce outcomes which are not consistent with the median voter hypothesis.

Ladd (1975) showed that the existence of a tax base other than residential real estate might produce a higher level of taxation. The existence of commercial and industrial property in the local tax base opens the possibility that the tax will be shifted forward in the form of higher prices, and not borne by the local residents.

Gramlich and Galper (1973) investigated the use of grants by higher levels of government to subsidize local public goods and services. This can be a substantial issue. For example, federal grants-in-aid to states and municipalities in 1983 exceeded collections from state personal income taxes that year. Gramlich concluded that many grants produce corner solutions and thus affect the income or wealth of the community but not the marginal price of public services.

These issues are of consequence in the present paper as well. The issues of differential voting patterns, shifting of business taxes, and grants-in-aid, are all dealt with explicitly. This paper also raises a further practical objection to the median voter model: that the functioning of representative governments is quite different from the sequential referendum procedure in determining the level of spending.

The representative system offers the potential for greater economic efficiency in determining the level of municipal spending than does the median voter model. One clear fault of the median voter model is that, if it works, it is unlikely to produce the efficient level of public services. Samuelson's condition that the sum of the marginal rates of substitution for the residents equal the marginal rate of transformation requires that the mean demand for public services, not the tastes of the median demander, be reflected in the outcome. Representative government offers the possibility that majoritarian outcomes may yield to more economically efficient outcomes such as those favored by the "omniscient" planner. This possibility is explicitly tested in the present paper.

This paper uses the federal tax deductibility of state and local taxes as the basis for empirical investigation. Studies designed to estimate the demand for state and local services based on tax deductibility have been fairly recent. Zimmerman (1983) uses an explicit median voter model to determine the demand for public goods. His analysis assumes that the median voter and the median income household in the state are synonymous. This is equivalent to assuming that all taxpayers have identical demands for local services, and all variation in quantity de-

manded is the result of price differences. The fact that a median income family is unlikely to itemize drives Zimmerman's conclusion that federal deductibility has no effect on state and local spending.

Hettich and Winer (1984) examined the share of state taxes derived from the personal income tax in the context of federal deductibility. Their results on the deductibility variable has the wrong sign, meaning that greater deductibility leads to a lower share of income taxes in total taxes. Their study has a number of statistical flaws. Furthermore, some of their findings on tax sources' own price and cross-price elasticities are counterintuitive. Nonetheless, their public choice model of maximization subject to political constraints may well be appropriate.

Inman (1985) examined 41 large cities over the period 1960 to 1980 using an estimate of the average federal tax price prevailing locally. Like Hettich and Winer, Inman reports counterintuitive signs for cross-price elasticities between property and income and sales taxes. Again, an implicit median voter model was used to calculate tax prices. Incomes at the 25th, 50th, and 75th percentiles of local incomes were applied to the national probability of itemizing at those incomes to obtain a federal tax price.

Feldstein and Metcalf (1987) substantially remedied the problems with estimating federal tax price. They used the National Bureau of Economic Research TAXSIM model to calculate the probability of itemizing and the tax rates faced by itemizers in each state. The highly disaggregated data provided by TAXSIM allowed the construction of instrumental variables to avoid the problems of statistical endogeneity between tax collections and tax price. They find very high elasticities of demand for deductible personal taxes with respect to after federal tax price. Feldstein and Metcalf's parameter estimates generally have very large standard errors, but the robustness of the results with respect to model specification lends support to their findings.

Feldstein and Metcalf experiment with three measures of deductibility: the average tax price facing itemizers and nonitemizers, the proportion of taxpayers itemizing, and the tax price facing itemizers. They find that the decomposition of the weighted average tax price into its two components, the proportion of taxpayers itemizing and the itemizers' price, has no substantial effect on their conclusions.

The present paper takes Feldstein and Metcalf as a starting point for analysis, but has a different methodological emphasis. While Feldstein and Metcalf sought a quantitative estimate of the elasticity of state and local spending with respect to tax price, this paper focuses on the mechanism by which the tax price facing individuals is translated into a collective decision, although the present text also quantifies the effect of federal deductibility on state and local tax collections. Several different models of state and local legislative behavior are considered.

First, this paper considers the appropriateness of modeling the expenditure process as representing the wishes of the electorate. This requires a departure from the Feldstein-Metcalf approach, to use the voter, rather than the taxpayer, as the unit of analysis. There are two key differences between voters and taxpayers. First, taxpayers may be family units consisting of more than one voter. Married taxpayers who file a joint return are counted as a single taxpayer by the IRS and on the TAXSIM file. On the other hand, such taxpaying units are likely to have two qualified voters in them. Second, survey evidence suggests that voting is positively correlated with income. Data from exit polls following the 1984 election[1] was used to estimate the likelihood of each tax return producing a voter.

For examination of voter-based models, this analysis adopts, with some modification, two of the Feldstein and Metcalf indicators of tax price: average tax price for all taxpayers and proportion of taxpayers itemizing. The first indicator assumes that the price facing each voter is weighted equally in the legislative process. In the standard version of this model, the price facing nonitemizing voters is unity while the price facing itemizing voters is unity less the value of their tax deduction. The sum of the prices facing all voters is divided by the number of voters to obtain the average price. This measure of price will be termed the "average price facing voters" (APFV) model. This is a more complex version of the median voter model. In that model, all voters are ranked by price and the median voter selected as representative. This model weights the price facing all voters equally, including the prices facing inframarginal voters.

The second voter-based model is the naive deductibility model, or naive write-off (NWO) model. This model assumes that taxpayers only care about whether they can write something off, without regard to the value of the income tax deduction. Although seemingly irrational to public finance economists, this model is in keeping with survey data suggesting that the great majority of the public do not know the marginal tax rate they face. This model is essentially identical to the proportion-itemizing model of Feldstein and Metcalf.

The final Feldstein and Metcalf model—average price facing itemizers—is not considered here. Such a model would be appropriate to a dominant party arrangement where itemizers were the dominant party, selected their median price in a primary election in which only itemizers could vote, and then carried that choice to victory in an election decided strictly by itemizer status.

Unlike Feldstein and Metcalf, the present paper also considers a planner model of public decision making. In this model, the legislative process is viewed as a collective decision based on maximizing col-

lective well being. Here, the price of taxation is the weighted average price of taxes. To compute this weighted average price, the tax saving due to deductibility of a tax is divided by the total revenue collected from that tax. This fraction is then subtracted from unity to obtain the weighted average price to the state of collecting a particular tax.

Unconstrained, the planner model would levy taxes on the taxpayer with the lowest postfederal tax price first, until that taxpayer was pushed to a higher tax price. Then all taxpayers at the higher tax price would be taxed until they were pushed to the next higher tax price. Such a model would maximize the federal share of the total cost of the revenue collected. States might be constrained in adopting extreme versions of this approach because of the mobility of high federal income tax rate voters.

The adoption of this model required consideration of the Feldstein-Metcalf arguments regarding endogenously determined prices. A specification of the effect of prices on taxes is given by equation (1):

$$T_i = a_0 + a_1 Y_i + a_2 P_i + a_3 \mathbf{Z}_i + u_i. \tag{1}$$

In this model, T is per capita tax collections, Y, per capita income, $\mathbf{Z}$, a vector of demographic attributes of the state, and P, some measure of prices facing voters.

Ordinary least squares will produce unbiased parameter estimates only if values of u_i are independent of price and income. There are two reasons to suspect such independence. First, higher levels of taxation will increase the likelihood that taxpayers will itemize, thus depressing the price variable. Second, among itemizers, as taxes are increased, the taxpayer is pushed into lower tax brackets, thus increasing the value of the price variable.

Feldstein and Metcalf choose three instrumental variables to avoid this problem. The first is the "first-dollar price" which is computed by excluding state and local tax deductions from the itemizer calculus. A marginal tax rate is then assigned to each return from the tax table as is the probability of itemizing based on the national proportion of taxpayers itemizing at the taxpayer's income level. The second instrument is constructed in the same manner as the first, except that the national average amount of state and local tax deductions for the taxpayer's income class replaces the taxpayer's actual deduction before the marginal tax rate is computed. The third instrument is the proportion of taxpayers in the state who would be expected to itemize if each taxpayer's probability of itemizing was equal to the national average for his adjusted gross income class.

The case for such an instrumental variables approach relies on the assumption that an exogenous positive taste for state taxes reduces the

federal tax price and induces a negative correlation between the price variable and the stochastic disturbance. Such a situation would overstate the magnitude of a negative price elasticity.

This paper adopts two of these instruments, with some modification, and omits the third. The first-dollar price is computed for each of the three measures of price by eliminating the state and local tax deduction before computing the taxpayer's itemizer status or tax rate. This first-dollar price is then used as the first instrumental measure of the actual price.

Feldstein and Metcalf's second measure is to substitute the average state and local deduction in each taxpayer's income class for the actual deduction claimed by that taxpayer. This instrument seems appropriate for some classes of taxpayers, but not for others. On the one hand, this measure is appropriate for taxpayers who will itemize regardless of their level of state and local taxes. Substitution of the national average level of state and local tax deduction for the actual level eliminates the simultaneity between tax rate and the level of deductions for taxpayers whose itemizer status is not dependent on their level of state and local deductions.

On the other hand, for taxpayers whose itemizer status depends on their level of deductions, the Feldstein-Metcalf method of calculating the instrument may be inappropriate. The key issue is whether or not the taxpayer's deductions are above or below the national average for his or her income class. In the case of taxpayers who have above average levels of state and local deductions, no problem exists. Substituting the average level of such deductions for the actual level implies lowering the level of deductions claimed by that taxpayer. Some of these taxpayers may become nonitemizers as a result. For these taxpayers, with above average state and local deductions, the average level of deductions properly instruments their itemizer status.

But, this instrument is not symmetric for taxpayers with below average state and local deductions. For these taxpayers, substituting the average level of such deductions for the taxpayer's actual level implies raising the total deductions claimed by the taxpayer. Some of these taxpayers should switch from being nonitemizers to being itemizers as a result. But, because no data exist on their deductions, simply adding the average level of deductions to their existing deduction level of zero will not properly instrument their itemizer status. The result is an underestimate of the number of itemizers in states with below average levels of taxes. This underestimate produces a measure of price which is too high in states with low levels of taxes. As a result, it is likely to underestimate the sensitivity of taxes to tax price.

The present study mitigates this problem by determining an estimate of non–state and local tax deductions for these taxpayers. This is accomplished by creating a distribution of non–state and local taxes paid

deductions for taxpayers in each income group who would not itemize in the absence of the state and local tax deduction. These taxpayers are assigned a level of non–state and local tax deductions based on this distribution using a Monte Carlo procedure. The average level of state and local tax deductions is then added to the synthetic level of non–state and local deductions to determine the taxpayer's itemizer status and tax rate.

The third instrument used by Feldstein and Metcalf, determining the tax price based solely on the state's income distribution, is not used. This instrument, by substituting a national average measure of price for the actual state price, may be omitting a factor which is uncorrelated with the tastes for spending, but is correlated with the actual price in the state. For example, the state of Utah has the highest proportion of itemizers of any state in the union. The probable reason for this is that the dominant religious group in the state, the Latter Day Saints, practices tithing with regard to their charitable contributions. Substituting a nationally determined instrument for itemizing behavior will overstate the price of taxes in Utah, even though tastes for state spending and for Mormonism are uncorrelated.

Thus, for the voter model, two instruments were selected for each of the two measures of price. For the planner model of behavior, the same kind of instruments were computed for the weighted average price of each tax. Federal taxes were calculated for taxpayers in each state with the deduction for the particular tax in question removed. This zero deduction level of federal taxes was compared with the regular level of federal taxes to calculate the saving from the deductibility of the particular type of taxes. The saving was divided by the total state tax collection from the tax, from itemizers and nonitemizers alike, and the resulting ratio subtracted from unity to obtain a price.

In the case of the first-dollar price instrument, only the deductions of taxpayers who would itemize in the absence of the state and local tax deductions were considered in computing the saving. In the case of the second instrument, only the deductions for taxpayers who were considered itemizers were considered in computing the saving. In both cases, the denominator of the measure of price, total state tax collections, was unaffected.

The price thus obtained was the average price of collecting revenue from the tax. Except in the case of taxpayers who switched tax brackets as a result of the deduction, this is the same as the marginal price of collecting the tax. This measure of price differs from the others considered in that it weights the marginal price faced by each taxpayer by the amount of the tax that taxpayer paid.

The contrast between the voter models and the planner model is based on a choice of perception of the political process as derivative of voter preferences or as exhibiting maximizing behavior on its own.

In the case of the state and local legislative process, the dependent variables in the exercise are the level and composition of state taxes. A similar contrast of models can be made at the federal level. The voting of congressional delegations on the tax reform bill is modeled as functions of both a direct voting procedure by taxpayers and by the impact of the tax reform on the state overall.

The direct voting measure of support for the tax reform bill was computed using the NBER TAXSIM program to conduct a "referendum" among voters. Voters who saw their taxes reduced by at least 0.2 percent of income were assumed to vote yes, while those who saw their taxes increased by at least 0.2 percent of income were assumed to vote no. The voting results were calculated by state for comparison with the vote of the state's congressional delegation.

The planner model of congressional behavior is based on the effect of the tax reform bill on the total federal taxes paid by the state. In this case, congressmen may be assumed to ignore the will of the majority in the referendum if the impact on the state was adverse. The ratio of new to old federal taxes paid by the state was used as the independent variable.

Both models of congressional behavior also provide a means to check on the importance of federal deductibility of state and local taxes in the delegation's set of preferences. State and local elected officials, together with municipal employee organizations, are known to be a potent and organized political force. If the rise in the price of state and local revenue collections is indeed a serious matter, congressional voting on the tax reform bill should reflect that fact. The various measures of the cost of state and local revenue before and after tax reform are therefore entered as independent variables in the congressional voting equations.

Three sets of tests of the importance of federal deductibility of state and local taxes emerge. First, how does the deductibility affect the level of state and local tax collections? Second, how does deductibility affect the mix of taxes used to collect revenues? Finally, was the rise in the price of state and local tax collections (no matter how measured) of sufficient importance to affect congressional voting on the tax reform bill? The next section considers the issues involved in generating the data to examine these questions.

5.3 Sources and Construction of the Data Base

The data used in this study come from two primary sources, *Facts and Figures on Government Finance*, prepared by the Tax Foundation, and simulations performed using the National Bureau of Economic Research TAXSIM model. The former source provided data on the

aggregate levels of tax collection, by source, for each state. The latter source was used to calculate the level of itemized deductions and the price of revenue for each revenue source, by state. Data for 1983 were used both for revenue collection and for tax simulation purposes.

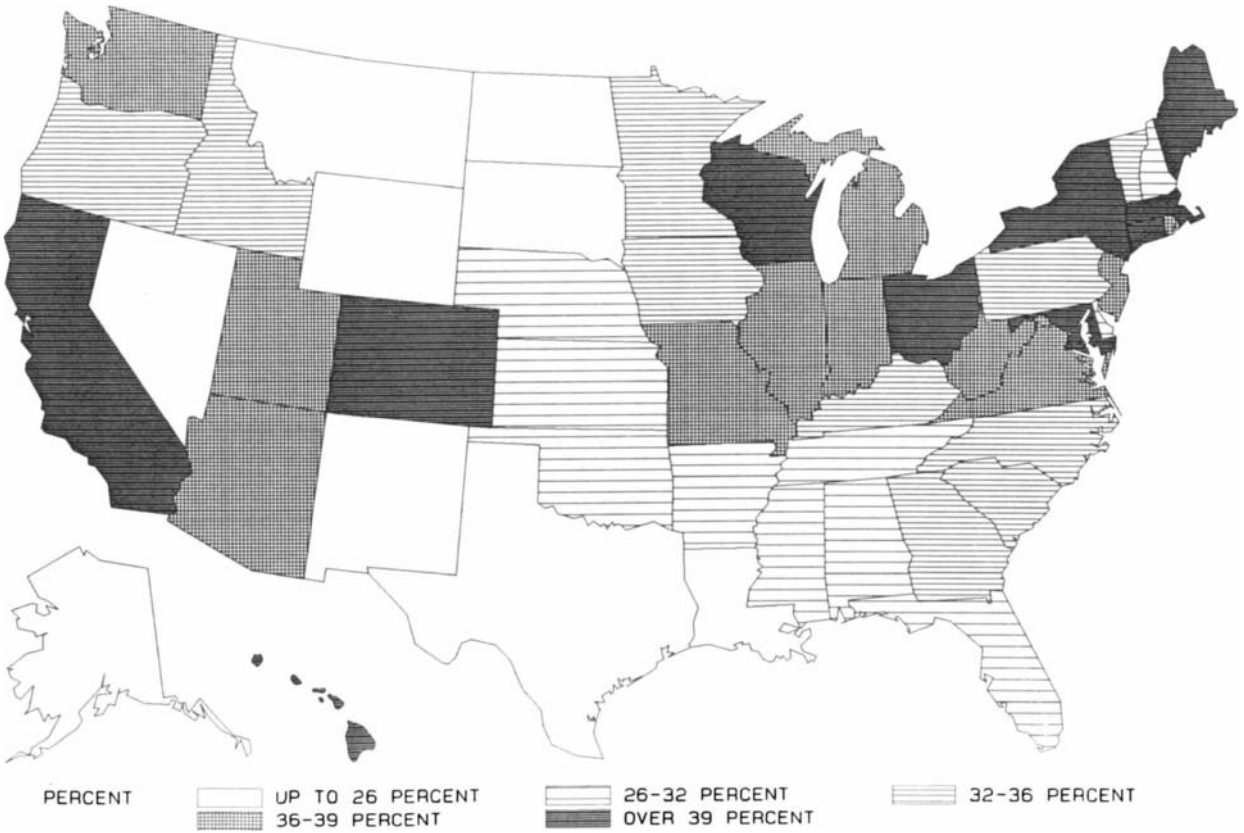
5.3.1 Deductibility of Nonpersonal Taxes

In 1983, state and local governments collected $487 billion, or $2,080 per capita. Of this, $385 per capita, or about 18 percent, represented transfer payments from the federal government. An additional $480 per capita represented various charges and miscellaneous sources of revenue, while $1,216 was collected in direct taxes for each person. This latter figure includes personal taxes such as personal income, retail sales, and residential real estate taxes, as well as direct taxes on businesses such as corporate profits taxes and taxes on commercial and industrial real estate. These direct forms of taxation constituted only about 60 percent of all state and local revenue.

Personal taxes made up about three-fifths of these direct taxes, so that typically, only 36 percent of state revenues came from direct personal taxes. Map 5.1 shows the importance of personal taxes in each state. Personal taxes are most important in the industrial states of the Northeast and Midwest, plus California. On the other hand, personal taxes are least important in the resource extraction states. Severance taxes are particularly significant in Alaska, Texas, and Louisiana, and the surface coal mining states of Montana, Wyoming, and the Dakotas.

The net cost to state residents of these various types of revenue is an issue subject to a substantial amount of interpretation. For example, aid from the federal government was treated as exogenous to the price of raising state and local taxes for the purposes of this study. However, a significant amount of federal aid is in the form of matching grants which requires some spending by the state or locality. This matching may alter the effect of differences in the cost of raising revenue. However, the benefits of matching are separable from the benefits of subsidized tax revenue since matching is done based on the gross expenditures of the municipality and not on the net-of-federal-tax cost of raising the money for those expenditures. The assumption of exogeneity of federal aid programs is therefore appropriate. In this conclusion we are largely following the findings of Gramlich (1977).

The various charges levied by the states and municipalities are also subject to interpretation regarding the appropriate measure of their cost. Fees which are levied on the basis of use, rather than wealth or income, are not deductible from the federal personal income tax. Water bills and highway tolls fit into this category. However, the bulk of these charges are borne, at the level of first incidence, by business. These fees include utilities taxes, airport use fees, highway use charges, and



Map 5.1 Personal taxes as a share of revenue. (Map by Andy Mitrusi)

severance taxes. To the extent that these taxes are passed along in product prices, the effect on business profits, and on the net cost of raising the revenue, is nil. This fact makes a case for assuming no federal offset in the cost of raising these taxes.

However, the final consumers who bear the incidence of these taxes may be found in a diffuse national market. Such a conclusion would represent a case for a municipality to view the levying of such taxes as a "free" good since nonresidents would pay the tax. Ladd (1975) investigates this hypothesis.

The possibility that firms may be mobile produces a Tiebout model of location at the firm level. A municipality which is small relative to the national market might therefore view increments to business taxes as falling on land rents. To the extent that these taxes are levied by all municipalities, there will be no diminution of local land rents, since there is no change in relative location values. This study therefore models these taxes in a two-step procedure. First, a base amount equal to the state's revenue from these other sources up to 80 percent of the 50-state average is viewed as passed through to final consumers and therefore nondeductible at the federal level. The excess over this amount is viewed as deductible at the federal corporate rate.

Taxes paid by corporations to states and localities are deductible against the federal corporation income tax. This reduces the net cost of the state tax payment if the corporation has positive profits. If the corporation does not have positive profits, the effect of the state taxes paid is to increase the loss carryforward of the corporation. When the corporation returns to profitability these losses will then be used to offset profits and tax liability. It is not clear from the available data how much state and local taxes are paid by taxable corporations and how much by corporations not subject to tax. This study assumes that state corporate income taxes are fully deductible, since profitability at the state level implies profitability at the federal level. The *Statistics of Income* shows that roughly 80 percent of total sales were made by taxable corporations in 1983. This study therefore assumes that 80 percent of business taxes are deductible.

The available data does not specify the source of property tax revenue. However, the *Census of Governments* provides data on the gross assessed value of locally assessed taxable real property in each state. This study apportioned total property tax collections in proportion to assessed values. Residential real estate was assumed to be taxed to individuals while commercial and industrial real estate plus vacant land was assumed to be taxed to corporations. This neglects the fact that some residential real estate is owned by corporations and that some commercial and industrial real estate is owned by proprietorships and partnerships.

5.3.2 Personal Taxes

The three major sources of personal tax revenues are personal income taxes, sales taxes, and property taxes. As mentioned above, residential property was assumed to be owned by individuals and real estate taxes on such property deducted at the individual level. Individual income and sales taxes required no such apportionment.

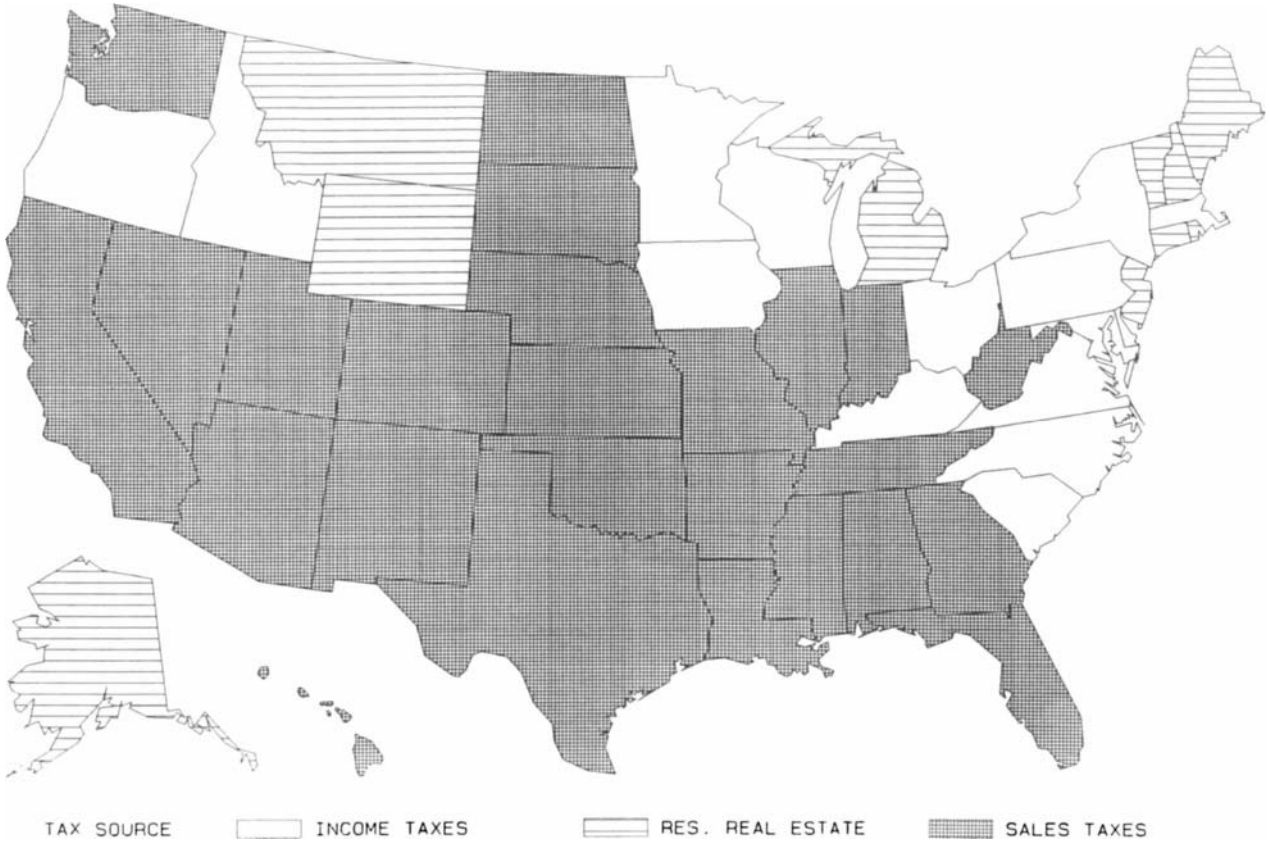
Map 5.2 shows which of these taxes is the primary source of personal tax revenue in each of the states. As the map clearly shows, the largest source of personal taxes is the retail sales tax, being the dominant tax in 25 states. Property taxes dominate in 10 states while personal income taxes are the dominant form of personal taxation in 15 states. The regional variation is quite marked. Sales taxes are the most popular in the South and West. Income taxes dominate in the East, except for New England where residential property taxes generate the most revenue.

The deductibility of these personal taxes depends on the itemizer status of the taxpayer, and the value of the deduction depends on the taxpayer's marginal tax rate. In order to compute these values, the National Bureau of Economic Research TAXSIM model was used. This computerized model, like similar models at the Department of Treasury and the Joint Committee on Taxation relies on a large data base of actual tax returns. For this study, the 1983 Individual Tax Model File Public Use Sample was used. This data base contains a stratified random sample of roughly 120,000 individual tax returns for 1983. Because of cost considerations, a one in four random sample of the data was used.

The TAXSIM routine calculates the itemizer status, tax liability, and marginal tax rate of each taxpayer by simulating the effect of the tax law on the data contained on the taxpayer's tax return. Values for 1983 were computed based on the tax law and tax rates prevailing in that year.

In order to simulate the effect of the new tax law, the Tax Reform Act of 1986, the 1988 version of that law was selected. The dollar values contained in that version were deflated to 1983 levels using the estimated change in the consumer price index between those years. Thus, the tax brackets, standard deduction, and personal exemptions all reflected the real value of their actual 1988 levels evaluated in 1983. The effect of the new law was then simulated in the same manner as the old law, with a new itemizer status, tax liability, and marginal tax rate for each taxpayer.

The Individual Tax Model File contains state identifiers for all taxpayers with incomes under $200,000. State identifiers are withheld from the top bracket taxpayers in order to protect confidentiality. These taxpayers constituted only 0.2 percent of the total number of tax returns



Map 5.2 Largest source of personal taxes. (Map by Andy Mitrusi)

filed in 1983. Thus, for measures which weighted all taxpayers equally, such as those used by Feldstein and Metcalf, neglect of the top bracket taxpayers was of little consequence. However, these taxpayers pay state and local taxes, particularly income taxes, out of proportion to their numbers. Thus, a weighted average measure of the price of raising state and local revenue must include the effect of deductibility on these taxpayers.

To accomplish this, the distribution among the states of income for taxpayers earning over $200,000 was computed from the 1981 *Statistics of Income*. (This was the last *SOI* to include a state-by-state breakdown by income class.) The national aggregate values for the income and tax data from the 1983 Individual Tax Model File were apportioned among the states using this data. This high-income data was then added to the data for taxpayers with incomes under $200,000 to obtain a state-by-state total level of taxes, deductions, and income.

5.3.3 Other Measures

The TAXSIM program automatically converts the number of taxpayer files it studies into a representative number of actual taxpayers by using a sample weight from the taxpayer file. The analysis done in this paper was not done by tax return, however, but by voter. Given the objective of measuring the importance of public sentiment, this is a key transformation. TAXSIM assigned a number of voters to each tax return using the income and marital status of the household filing the return based on data drawn from exit polls following the 1984 election.

The probability of voting varies most significantly with income class. The data showed that 29 percent of eligible persons with incomes under $5,000 vote, as do 40 percent with incomes between $5,000 and $10,000, 45 percent with incomes between $10,000 and $20,000, 66 percent with incomes between $20,000 and $30,000, 74 percent with incomes between $30,000 and $40,000 and 85 percent with incomes over $40,000. The adjusted gross income of elderly taxpayers was augmented by $6,000 for single returns and $10,000 for joint returns with two elderly exemptions in order to calculate the likelihood of taxpayers on those returns voting. Tax returns filed using single taxpayer, head of household, and married filing separately filing status were assumed to represent a single potential voter. Tax returns filed by married taxpayers filing jointly were assumed to have two potential voters. The probability of voting given the income class of the taxpayer was multiplied by the number of potential voters in the household to assign an actual number of voters to each tax return.

The calculations done on deductibility and price used these new sample weights to determine statewide levels. A tax return was cal-

culated as itemizing if the total deductions claimed on the return exceeded the standard deduction for the tax law being simulated. Households which itemize face lower prices than those which do not. These taxpayers are therefore more likely to favor state and local public spending than are other households.

Map 5.3 shows the proportion of voters itemizing in each state. The earlier study by Feldstein and Metcalf found that nonitemizers filed a majority of the tax returns in each state. As married couples are more likely to itemize than nonmarried individuals and as higher income taxpayers are more likely both to itemize and to vote, their finding is reversed with the use of this measure. Nonitemizers are a majority of voters in 22 states while itemizers dominate in 28. Higher-income states clearly tend to have more itemizers than do lower-income states.

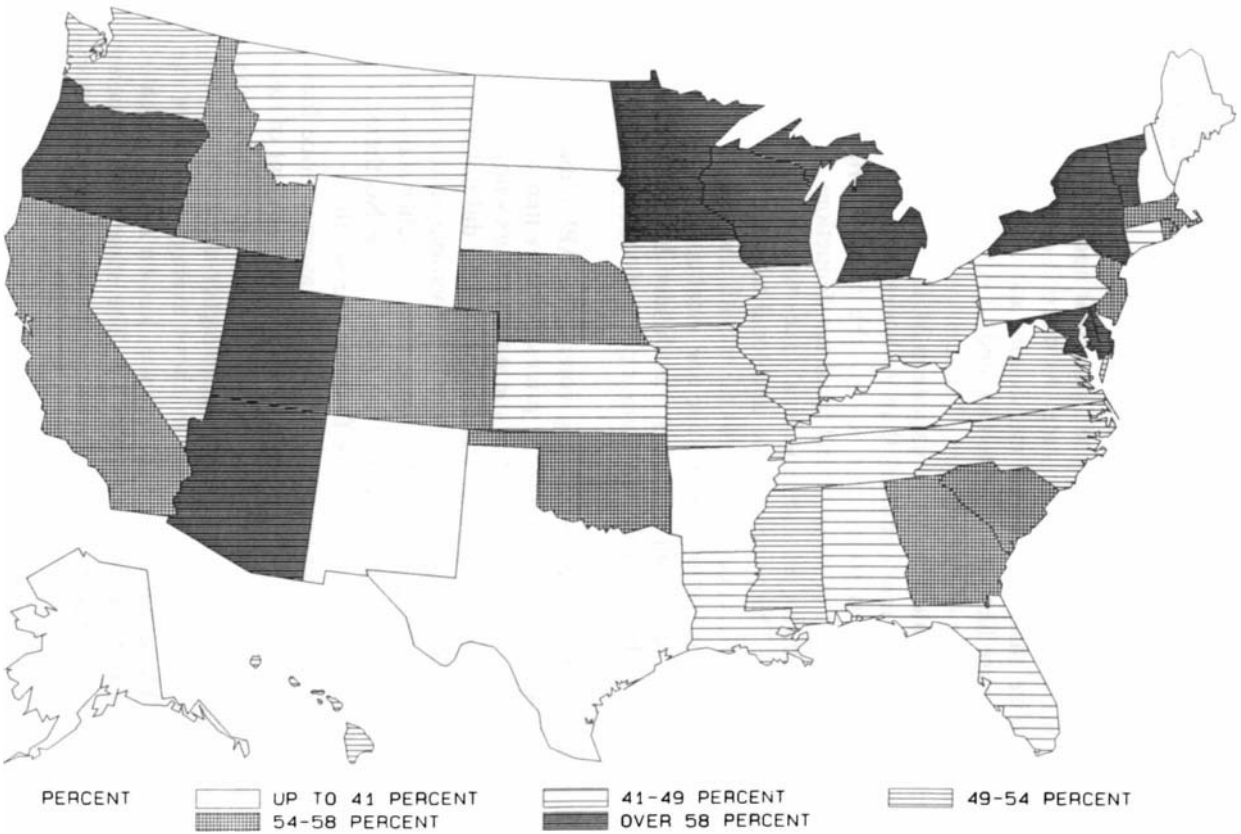
Separate calculations were done to find the average price facing itemizers and the cost of all state and local tax deductions. For these variables, the values for all state and local taxes were set to zero and taxes recomputed. The price of state and local taxation facing each itemizer was the difference between his taxes with and without his tax deduction divided by the amount of state and local taxes claimed. The total change in taxes for all itemizers was divided by total personal taxes collected to obtain a weighted average price of collecting personal taxes.

The average price of revenue facing voters, the APFV measure of price, was computed by averaging the prices faced by itemizers, multiplying this figure by the proportion of the state's voters who itemized, and adding the proportion of the state's voters who did not itemize. Map 5.4 shows this average price measure in the various states. Again, poorer states have higher prices of revenue than do richer states. The lowest prices are found in the industrial parts of the Northeast and Midwest while the highest prices are found in the South.

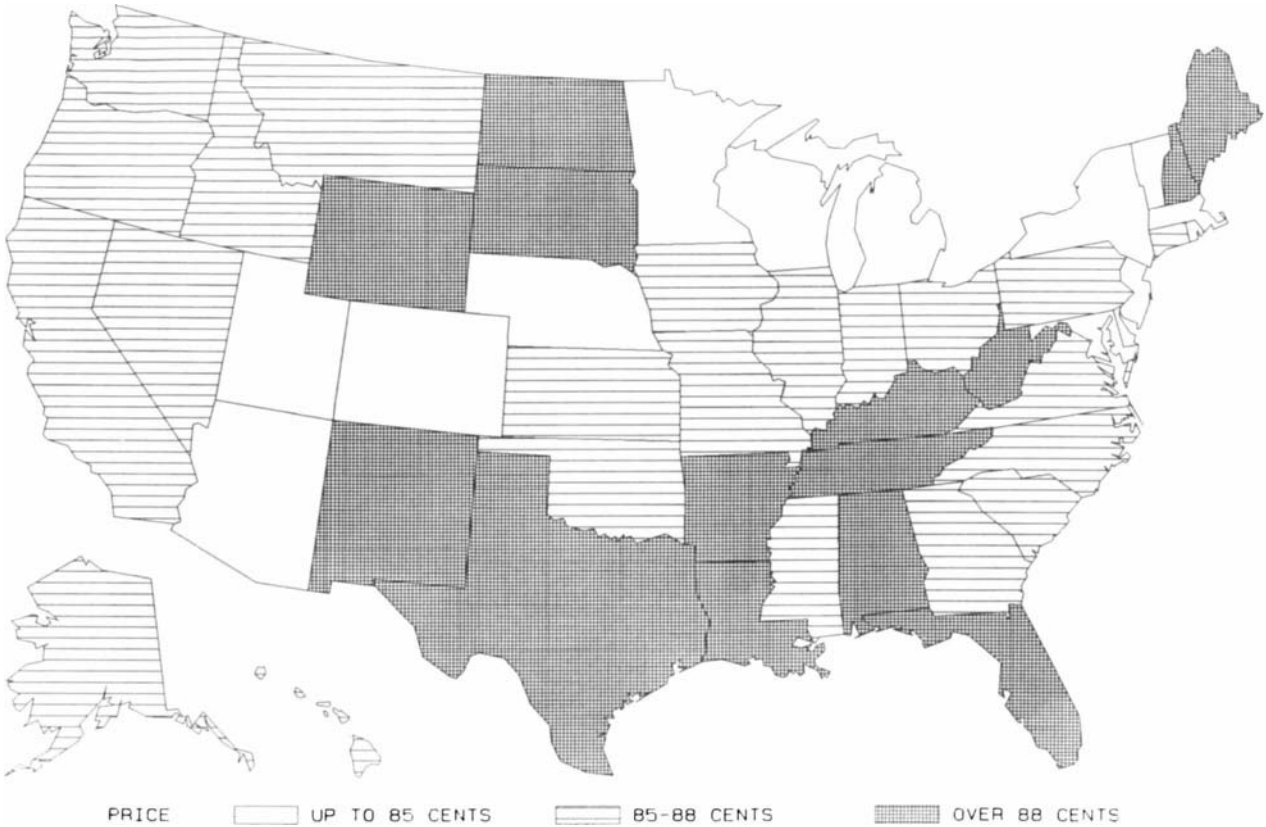
The average price of revenue differs from the average price facing voters in that it weights each taxpayer's price by the amount of taxes that taxpayer paid. The average price of revenue is generally lower than the average price facing voters because higher-income taxpayers, with lower prices, are likely to pay an above average portion of the state's taxes. The average price of revenue, known as the weighted average price (WAP), is shown in map 5.5. The same basic regional pattern emerges for this measure of price as for the earlier measures of price.

5.4 Econometric Results

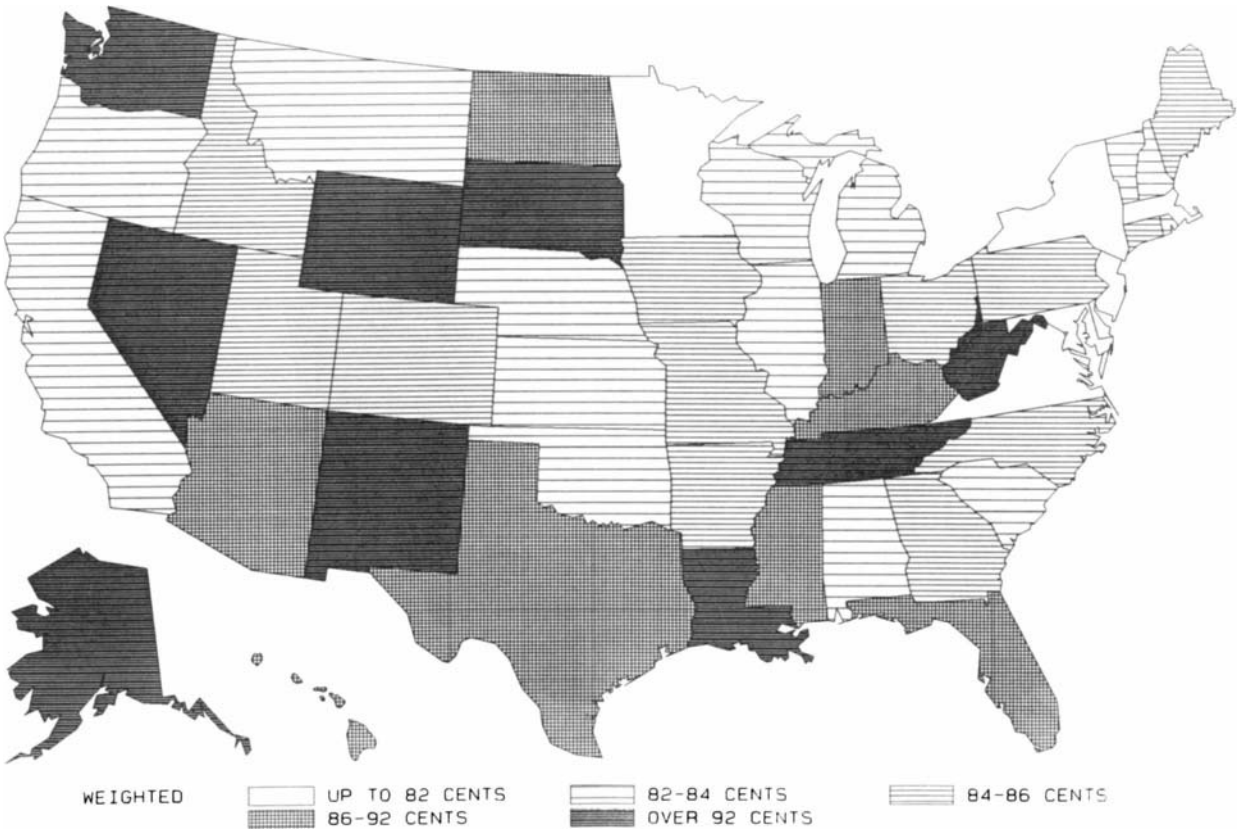
The objective of this research was to test the mechanism by which state and local tax deductibility affects decision making by elected



Map 5.3 Voters itemizing under old law. (Map by Andy Mitrusi)



Map 5.4 Average price of revenue facing voters under old law. (Map by Andy Mitrusi)



Map 5.5 Average price of revenue under old law. (Map by Andy Mitrusi)

representatives. Three sets of tests are considered. First, how much, and by what mechanism, are state and local decision makers influenced by deductibility in setting the level of taxes. Second, how much, and by what mechanism, are state and local decision makers influenced by deductibility in setting the type of taxes levied? Third, did state congressional delegations take account of the effect of the Tax Reform Act of 1986 on the cost of raising state and local revenue? Each question is considered in turn.

5.4.1 Deductibility and the Level of Taxes

To test the relationship between deductibility and the level of taxes, a reduced form equation was specified with the per capita level of taxes as the dependent variable. Independent variables included personal income per capita, price, and other forms of revenue. Since no single specification is structurally related to the decision making process, a variety of definitions of the variables were tried. The general form of the specification is given by equation (2):

$$(2) \qquad T_i = b_0 + b_1 Y_i + b_2 P_i + b_3 R_i + b_4 \mathbf{D}_i + e_i.$$

In this case T represents the per capita level of taxes collected in the state, Y, the per capita level of personal income, P, the price of revenue, R, the level of per capita revenue from exogenous sources, and $\mathbf{D}$ is a vector of demographic characteristics of the state designed to capture tastes for public expenditure.

Absent the demographic variables, the expected results would include positive values for the income coefficient, b_1. In linear form, the income coefficient tells the fraction of each additional dollar of personal income which would be taken in taxes. The demographic variables used to control for tastes are often correlated with income. Absent these taste considerations, which also to some extent reflect the costs of public service provision, there is no particular reason to expect higher state and local taxes in higher income states.

The coefficient on the price term, b_2, describes how federal deductibility influences the level of taxes collected. Greater deductibility lowers the price of raising revenue. If b_2 is negative, as expected, this will imply greater state and local revenue collections as a result of deductibility. Three measures of price are tried. The first is the proportion of taxpayers who are not itemizers. This is the naive write-off model of deductibility since it implies that itemizers only consider the fact that state and local taxes are deductible, not the amount of tax saving such deductibility entails. The second price measure is the average price facing voters. This measure assigns a price of unity to nonitemizers and unity minus the taxpayer's marginal tax rate to itemizers. All voters are counted equally in computing the average price. The final

measure is the weighted average price of taxes which weights the prices facing each voter by the amount of personal taxes each pays. This measure is designed to test the planner model of representative behavior. No individual voter should care about the amount of taxes paid by other voters, and hence the weighted average price. But, decision makers who evaluate the net cost of revenue to the state as whole, and not to individual voters, should use the weighted average measure. In some specifications, a weighted average price of revenue, including business taxes, was also tried. As discussed in the previous section, two instrumental variables were used for each of these measures of price: one representing the first-dollar price and the second representing the tax price if the average level of state and local taxes is assigned.

The existence of other revenue sources should influence the level of taxation in the state. For example, states which levy severance taxes on natural resource extraction, or which run very successful state lotteries, might be expected to use this revenue to reduce taxes on the residents. Grants-in-aid from the federal government should substitute for locally raised revenue. As a result, the expected sign on the other revenue coefficient, b_3, is negative. A number of definitions of other revenue are tried to see if some forms of revenue affect state and local tax collections differently from other sources of revenue.

In order to control for the role of tastes in determining the level of state and local taxation, a series of demographic variables were used. In the tables which follow, *PUPILS* represents the ratio of students in school to the state's total population, *ROAD* indicates road mileage per capita, *NONWHITE* is the proportion of the state's population which was nonwhite in the 1980 census, *URBAN* is the proportion of the state's population living in urban areas in 1980, *POVERTY* is the percentage of the state's population below the poverty line, and *ELDERLY* is the percentage of the state's population over age 65. Finally, *HOMEOWN* represents the percentage of the state's population living in a home they own.

Two independent variables are tried, personal taxes per capita and personal plus business taxes per capita. A comparison of the regressions done on just personal taxes with those done on personal plus business taxes shows the amount of substitutability between these taxes.

The results of these regressions are presented in tables 5.1 and 5.2. Table 5.1 shows the regression results when personal taxes per capita is the dependent variable while table 5.2 presents the results when the dependent variable is personal and business taxes per capita. The first set of regressions ignored the effect of other sources of revenue on tax collections, while the second set of regressions included federal aid and interest receipts per capita, and the third set of regressions included

Table 5.1 **Regression Results for Personal Taxes per Capita Using Various Measures of Price**

	Measure of Price					
Variable	NWO1	NWO2	APFV1	APFV2	WAP1	WAP2
Intercept	2089*	2702*	3054	6069*	1982	2444*
INCOME P.C.	−0.02	−0.02	−0.02	−0.05*	−0.02	−0.02
PRICE	−126	−1180*	−1073	−4079*	−12	−484
PUPILS	11	14	13	8	8	10
ROAD	−0.31	−0.36	−0.29	−0.24	−0.32	−0.29
NONWHITE	2.34	2.33	2.23	1.31	2.25	2.07
URBAN	1.58	−1.57	0.99	0.05	2.25	2.00
POVERTY	−34*	−28*	−35*	−31*	−34*	−32*
ELDERLY	20	32	32	27	17	16
HOMEOWN	−18*	−21*	−19*	−21*	−17*	−18*
R^2	0.542	0.634	0.549	0.623	0.540	0.549
Intercept	1984	2579*	2930	6118*	1687	2324
INCOME P.C.	−0.01	−0.01	−0.01	−0.03	−0.01	−0.02
FED&INT P.C.	−0.05	−0.06	−0.05	−0.08	−0.06	−0.03
PRICE	−120	−1202*	−1046	−4302*	−179	−417
PUPILS	15	21	18	16	13	13
ROAD	−0.36	−0.42	−0.34	−0.31	−0.37	−0.32
NONWHITE	2.08	1.98	1.99	0.82	2.01	1.95
URBAN	1.20	−2.20	0.62	−0.77	1.85	1.79
POVERTY	−32*	−26*	−33*	−27*	−31*	−31*
ELDERLY	17	28	21	23	13	14
HOMEOWN	−18*	−22*	−20*	−23*	−17*	−18*
R^2	0.546	0.641	0.552	0.635	0.545	0.550
Intercept	1851	2441*	2785	6034*	1410	2104
INCOME P.C.	−0.00	0.00	−0.01	−0.02	−0.00	−0.01
FED,INT, & OTH	−0.02	−0.02	−0.02	−0.03	−0.02	−0.02
PRICE	−123	−1210*	−1034	−4376*	296	−320
PUPILS	18	23	20	18	16	16
ROAD	−0.36	−0.42	−0.34	−0.31	−0.38	−0.34
NONWHITE	1.97	1.89	1.87	0.72	1.92	1.84
URBAN	0.85	−2.56	0.30	−1.16	1.53	1.48
POVERTY	−30*	−24*	−31*	−25*	−30*	−30*
ELDERLY	15	26	19	21	11	12
HOMEOWN	−18*	−22*	−20*	−22*	−17*	−18*
R^2	0.553	0.650	0.560	0.623	0.554	0.555

Note: An (*) indicates significance at the 95 percent confidence interval.

Table 5.2 **Regression Results for Personal and Business Taxes per Capita Using Various Measures of Price**

	Measure of Price					
Variable	NWO1	NWO2	APFV1	APFV2	WAP1	WAP2
Intercept	1336	2076	1982	6203*	582	1339
INCOME P.C.	0.05	0.05*	0.05	0.02	0.05	0.05
PRICE	−22	−1259*	−669	−4888*	709	−20
PUPILA	45	51	48	44	42	45
ROAD	0.06	0.02	0.08	0.16	0.05	0.07
NONWHITE	0.58	0.65	0.56	−0.56	0.81	0.56
URBAN	−1.93	−5.88	−2.59	−4.43	−1.38	−1.83
POVERTY	−33*	−27*	−33*	−29*	−33*	−33*
ELDERLY	21	36	25	33	20	20
HOMEOWN	−23*	−8*	−24*	−28*	−21*	−23*
R^2	0.609	0.671	0.611	0.678	0.617	0.609
Intercept	1736	2388*	2468	6115*	1463	2248
INCOME P.C.	0.01	0.03	0.01	−0.01	0.01	0.00
FED & INT P.C.	0.18	0.16	0.18	0.14	0.17	0.21*
PRICE	−45	−1202*	−773	−4492*	209	−527
PUPILS	28	35	31	30	28	27
ROAD	0.24	0.17	0.25	0.28	0.22	0.29
NONWHITE	1.55	1.51	1.51	0.29	1.53	1.46
URBAN	−0.50	−4.28	−1.14	−2.97	−0.22	−0.29
POVERTY	−40*	−34*	−41*	−35*	−40*	−40*
ELDERLY	31	44	36	40	30	31
HOMEOWN	−22*	−26*	−23*	−26*	−21*	−22*
R^2	0.642	0.698	0.644	0.699	0.642	0.647
Intercept	1796	2461*	2516	6240*	1443	2303
INCOME P.C.	0.01	0.02	0.01	−0.01	0.01	0.00
FED, INT, & OTH	0.04	0.04	0.04	0.03	0.04	0.05
PRICE	−28	−1214*	−745	−4569*	283	−487
PUPILS	31	38	34	33	31	30
ROAD	0.16	0.11	0.18	0.23	0.15	0.20
NONWHITE	1.29	1.29	1.27	0.07	1.31	1.21
URBAN	−0.52	−4.42	−1.22	−3.13	−0.32	−0.36
POVERTY	−40*	−34*	−40*	−35*	−39*	−39*
ELDERLY	30	44	34	39	29	30
HOMEOWN	−23*	−27*	−24*	−28*	−22*	−23*
R^2	0.634	0.691	0.636	0.693	0.635	0.638

Note: An (*) indicates significance at the 95 percent confidence interval.

federal aid, interest, and other nontax revenue per capita as a dependent variable.

Six different price measures were used, representing two different instruments for each of three different prices. The naive write-off model is indicated by NWO, the average price facing voters by APFV, and

the weighted average price by WAP. For each price, the first measure uses the first-dollar method of instrumenting the variable while the second measure uses the imputed national average technique. Both techniques are described in the previous section.

The results strongly suggest that the first-dollar measure of price is inferior to the imputed national average measure, particularly in the two voter-based models—NWO and APFV. In all of the regressions using these measures of price, R^2 was substantially lower using the first-dollar price than when the imputed national average technique was used. In addition, the price variable was consistently statistically significant using the second instrument but never significant using the first instrument.

A likely reason for this is that the first-dollar technique ignores the effect of the state and local tax deduction on the probability of itemizing. Actual decisions regarding the level of state and local spending are likely to be marginal, with little likelihood of affecting a voter's price or itemizing status. The first-dollar instrument calculates price on the extreme assumption that the taxpayer has no state and local tax deduction. While roughly half the voters actually itemize their deductions, the first-dollar method estimates that less than one-third do. The relationship between the proportion itemizing under the first-dollar method and the proportion actually itemizing may be monotonic, but it is likely to be quite complex and certainly not linear. The first-dollar measure therefore is a poor instrument.

The data also show that the voter-based models, NWO and APFV, are much better at estimating the level of personal taxes than is the planner model using the WAP measure of price. The R^2 measure of explanatory power shows that the WAP measure is no better than the first-dollar price measure in the voter-based models. Furthermore, no statistically significant relationship between price and the level of taxation is found using the WAP measure of price.

This evidence strongly supports the conclusion that deductibility of state and local taxes affects the level of state and local spending in a rather egalitarian manner. It seems that the number of voters affected by deductibility is the primary determinant of support for higher state and local spending. Legislatures seem to take very little account of the actual aggregate cost to the state of raising additional revenue, except as it affects the cost faced by typical voters.

Under the NWO model, a switch from having all voters itemize to that in which no voters may itemize would lower personal taxes per capita by about $1,200. Stated in a more realistic context, a decrease in the fraction of voters itemizing of one percentage point would lower personal taxes per capita by $12. This is a very dramatic result. Personal taxes per capita averaged less than $1,000 in 1983, with roughly half

of all voters itemizing. An extension of this parameter to the extreme worlds of universal deductibility and no deductibility suggest that tax collections would vary from $400 with no deductibility to $1,600 with universal deductibility.

Three important caveats should be placed on this interpretation. First, it is always dangerous to extrapolate parameters estimated from relatively small cross-sectional differences to extreme situations. Second, such extrapolation is particularly inappropriate if majoritarian decision processes are involved. Given the current state of between 40 percent and 60 percent of voters itemizing, each one percentage point change in the number of itemizers is likely to have a major impact on the outcome of an election. Such an impact would necessarily be diminished in situations where less than 30 or more than 70 percent of the voters itemized. Third, it is important to keep in mind that a reduction in personal taxes does not necessarily mean an equal reduction in spending. Revenue sources such as user charges would become both more economically rational and more politically popular when federal deductibility of other revenue sources is eliminated.

The results from the APFV model reinforce the findings from the NWO regressions. In these regressions, a rise in the APFV measure of price by one percentage point reduces personal taxes by about $4,200. More realistically, this measure says that a one percentage point rise in the average price of taxation for the typical voter reduces personal taxes by $42. It is important to consider the determinants of the APFV measure. First, if the proportion of itemizers falls by one percentage point, the APFV measure of price rises only by the itemizers' marginal tax rate. Thus, a change in the proportion of itemizers moves this measure of price by only about 28 percent as much as it moves the NWO measure of price. Given this interpretation, the $4,200 parameter in the APFV model has almost exactly the same meaning as the $1,200 parameter in the NWO model.

Second, the APFV measure of price rises as itemizers' marginal tax rates fall, but a one percentage point fall in tax rates moves the price only by the percentage of voters itemizing, or about 0.5 percentage points. Thus, a one percentage point fall in the average marginal tax rate faced by itemizers would lower the level of personal taxes by about $21. As a rule of thumb, it would take a 5 percentage point rise in tax rates, equivalent to nearly a 20 percent income tax surcharge, to raise state and local personal taxes per capita by $100. The same change could be accomplished by an 8 percentage point change in the share of voters who itemize.

Table 5.2 presents the same set of regressions as table 1 except that personal and business taxes together form the dependent variable. Once again, the voter-based models determine the level of taxes better than

the planner model. The R^2 terms are higher on the NWO and APFV regressions than on the WAP regressions. Also, the first-dollar measure of price again is inferior to the imputed national average instrument.

The results in table 5.2 also mirror those in table 5.1 regarding the relative sizes of the NWO and APFV parameter values. This is somewhat surprising as it implies that increases in the price of personal taxes will not significantly alter the level of business taxes. In other words, the expected drop in personal taxes when the price of such taxes rises, will not be offset by increases in business taxes. Since only direct business taxes are measured here, it does not mean that indirect taxes such as user charges will not be substituted for lower personal tax revenue.

A comparison of tables 5.1 and 5.2 also produces an interesting conclusion about the use of business taxes as a revenue source. Although the parameter value is rarely significant, all 18 regressions of personal taxes per capita have a negative sign for the per capita income parameter. This suggests that, other things equal, personal taxes are lower in higher-income states than in lower-income states. By contrast, the per capita income parameter has a positive sign in 16 of the 18 regressions in which business and personal taxes form the dependent variable. Taken together, it seems that upper-income states clearly rely more on business taxes than do lower-income states.

This calls for a reinterpretation of the Tiebout model with regard to firms. One possibility is that firms are unable to move easily, and can therefore be heavily taxed. A second possibility is that low-income states deliberately maintain low business taxes in order to attract new firms while high-income states need not be as aggressive in attracting new sources of employment.

The existence of nonpersonal, nonbusiness sources of revenue does little to change the basic relationships among tax revenue, income, and price. However, the addition of these variables to the regressions produces the surprising result of very little substitution of these other forms of revenue for personal and business taxes. For example, the regressions show that each dollar of federal aid and interest received lowers personal taxes by between 3 cents and 8 cents, while the sum of personal and business taxes actually rises by between 14 and 21 cents with each dollar of federal aid and interest received! The addition of other own-source revenue implies that personal plus business taxes rise only about 4 or 5 cents per dollar received while personal taxes fall by between 2 and 3 cents per dollar received.

This data suggests that, at the margin, other own-source revenue largely substitutes for business taxes. As these other forms of tax are roughly as large as federal aid and interest, the coefficients mean that other revenue reduces direct business taxes by about 10 cents on the

dollar. Still, all of these results are strikingly low. The frequent claim that a new excise is being introduced to "hold the line" on other taxes is given a new interpretation: the new excise will mean that personal taxes will be just as high as they otherwise would have been.

5.4.2 Deductibility and the Type of Taxes

The preceding section showed that higher costs for raising personal taxes lower the level of personal taxes raised, other things equal. This section examines the effect of tax deductibility on the choice of which type of personal tax is used. While most states raise personal taxes from each of the three major sources of taxation—income, retail sales, and real estate—the mix of taxes used varies substantially among the states.

Per capita levels of sales, income, and residential property tax revenues were regressed against the same variables as were personal and personal plus business taxes in tables 5.1 and 5.2. Weighted average price measures were dropped because of the endogeneity of the weights with the type of tax used. In each case, the sum of federal aid plus interest received was used to control for other revenue sources. The results are summarized in table 5.3.

The data show radically different explanations for the three types of taxes analyzed: sales, income, and residential real estate. The models are not very good at predicting the level of sales or income taxes, but the R^2 value is quite good in the case of residential real estate taxes. In the case of sales taxes, the R^2 values show that only about one quarter of the variation in the data is explained by the model. None of the estimated parameters is statistically significant. This suggests that the sales tax may be a "default" tax, only collected if there is no attractive alternative.

Income tax collections are negatively correlated with the price of taxation in a statistically significant manner. An increase of one percentage point in the fraction of taxpayers itemizing produces an $8 increase in the amount of income taxes collected per capita. By contrast, a cut in the APFV measure of price produces about $27 more in income taxes.

As in the case of the NWO and APFV parameters in the total tax regressions, these $8 and $27 figures are essentially equivalent. A one percentage point increase in the proportion of voters itemizing would raise the NWO measure by one point, but the APFV measure by only the itemizers' marginal tax rate. As this rate is approximately 28 percent, the net change in income taxes is about $8 by either measure. By contrast, a one percentage point increase in the itemizers' marginal tax rate would lower the APFV measure by the fraction of voters itemizing, or roughly one-half of 1 percent. In turn, this would imply an increase in income tax revenue of about $13 per capita.

Table 5.3 **Regression Results for Type of Personal Tax Levied Using Various Measures of Price**

Variable	Measure of Price			
	NWO1	NWO2	APFV1	APFV2
Dependent Variable: Sales Taxes per Capita				
Intercept	−94	27	−1063	−184
INCOME P.C.	−0.01	−0.01	−0.01	−0.01
FED & INT P.C.	−0.07	−0.06	−0.07	−0.06
PRICE	114	−44	1051	179
PUPILS	17	19	15	19
ROAD	−0.04	−0.04	−0.06	−0.04
NONWHITE	2.54	2.64	2.60	2.67
URBAN	2.97	2.27	3.56	2.49
POVERTY	−0.13	−0.48	1	−1
ELDERLY	−1.07	2.72	−5	2
HOMEOWN	−2.53	−3.60	−1	−3
R^2	0.264	0.261	0.282	0.262
Dependent Variable: Income Taxes per Capita				
Intercept	1551	1752	3817*	3934*
INCOME P.C.	0.01	−0.00	−0.01	−0.02
FED & INT P.C.	−0.13*	−0.12	−0.13*	−0.13*
PRICE	−449	−805*	−2604*	−2714
PUPILS	−6	−11	−3	−14
ROAD	0.05	0.01	0.10	0.09
NONWHITE	0.66	0.49	0.36	−0.27
URBAN	−4.29	−4.42	−4.90*	−3.39
POVERTY	−10	−6	−12	−7
ELDERLY	1	0	6	−4
HOMEOWN	−10	−9	−12	−9
R^2	0.310	0.354	0.365	0.342
Dependent Variable: Residential Real Estate Taxes per Capita				
Intercept	−344	−18	−984	1137
INCOME P.C.	0.03*	0.04*	0.04*	0.03
FED & INT P.C.	−0.03	−0.02	−0.03	−0.02
PRICE	267	−161	847	−1254
PUPILS	19	24	20	23
ROAD	−0.46	−0.46	−0.48	−0.43
NONWHITE	−2.61	−2.35	−2.42	−2.65
URBAN	0.73	−1.10	0.31	−1.26
POVERTY	−6	−7	−6	−7
ELDERLY	2	11	4	13
HOMEOWN	−4	−7	−4	−7*
R^2	0.659	0.642	0.653	0.661

Note: An (*) indicates significance at 95% confidence interval.

Income taxes are the most efficient revenue source to pass on to the federal government since the amount collected from each taxpayer rises with the taxpayer's federal tax rate. Progressive tax systems may be imposed at the state level with actual burdens which may be quite close to proportional.

In spite of the advantages of progressivity within a state, there is no evidence that the income tax is distributed in a progressive fashion among the states. In fact, the high positive intercept term (significant in the APFV model) and negative, if insignificant, per capita income coefficient ensure that income tax collections take a smaller share of personal income in high-income states than in low-income states. In general, the level of income within a state is a poor explanator of the level of the state's income tax collections.

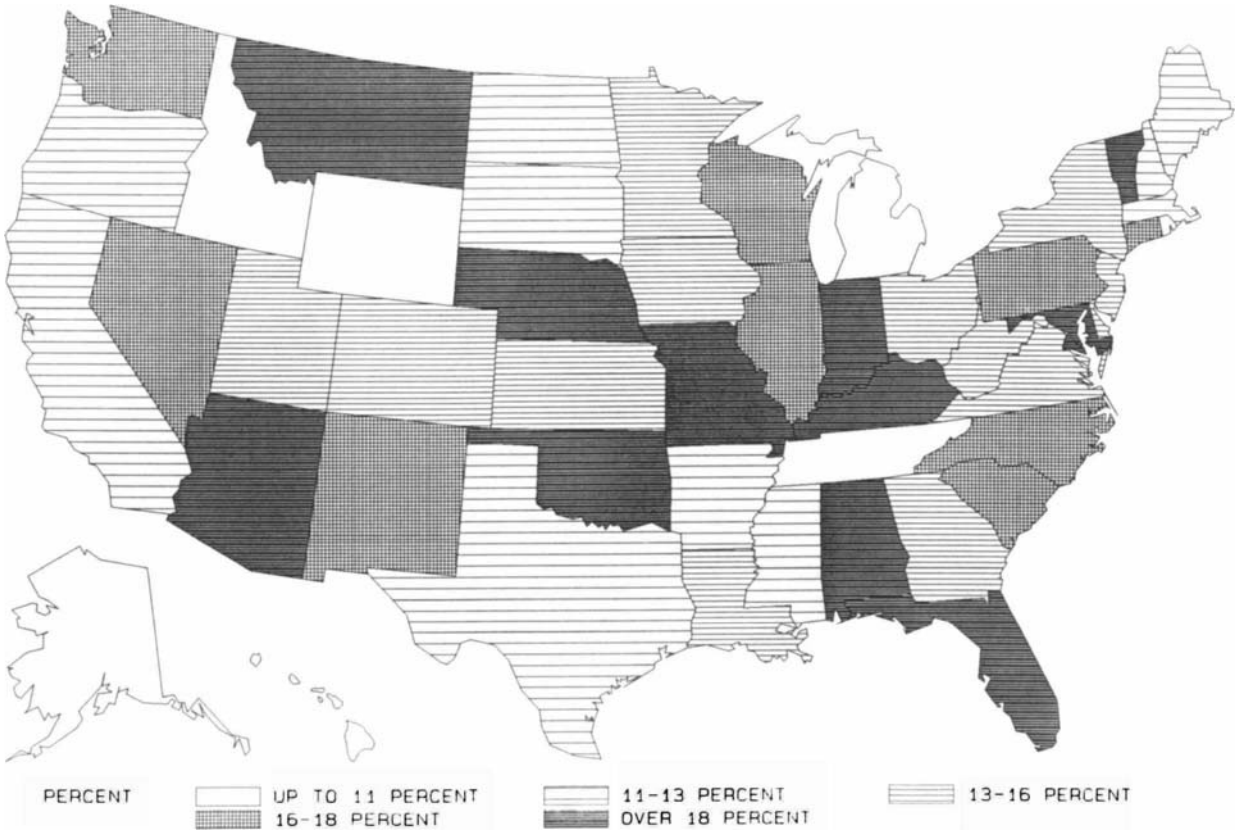
By contrast, residential real estate taxes are quite closely tied to the level of income in the state. The low and insignificant intercept terms in these regressions coupled with the statistically significant income coefficients suggests that residential real estate collections are roughly proportional to income across the states. The price effect is not significant and is of indeterminant sign.

5.4.3 Voting Behavior of State Congressional Delegations

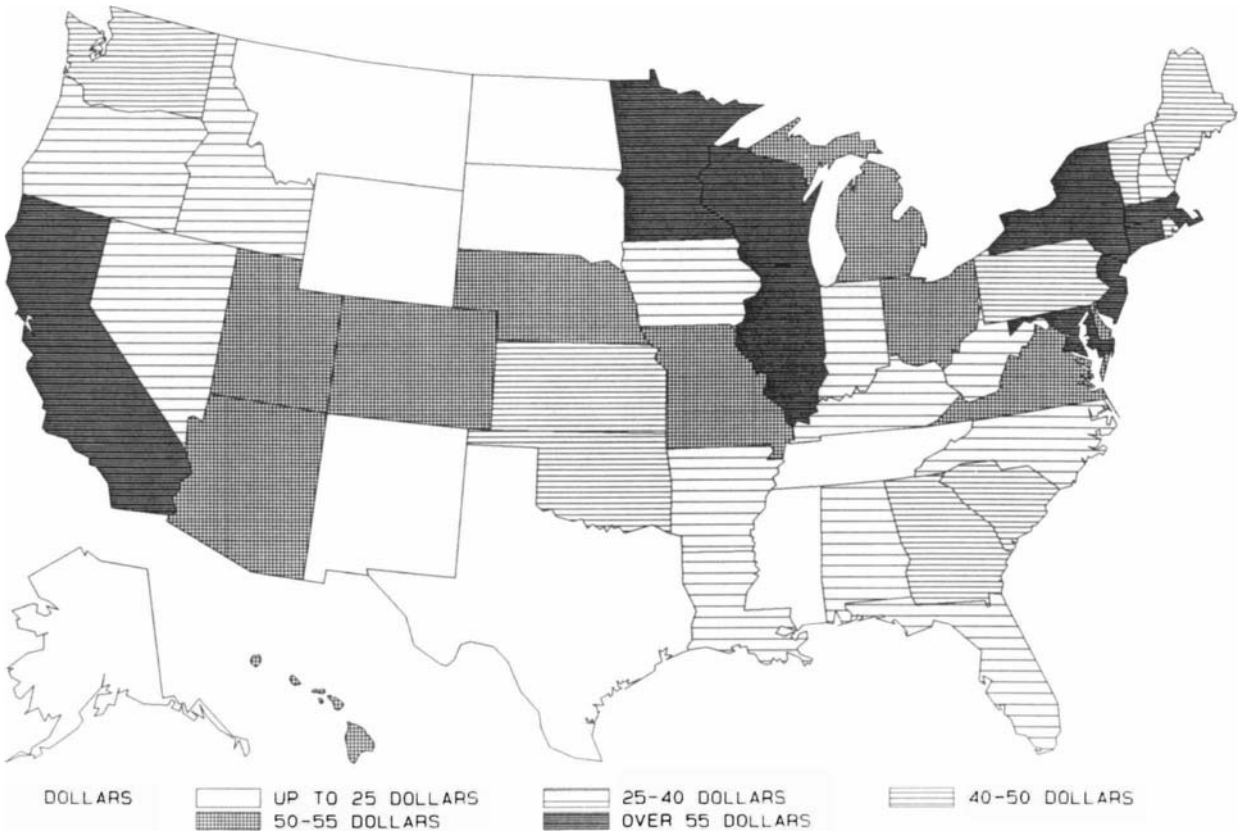
The Tax Reform Act of 1986 greatly reduced the federal subsidy of state and local tax collections, and eroded the political base for state and local spending. This reduction in federal tax subsidies occurred in three ways. First, the deductibility of state and local sales taxes was eliminated. As map 5.2 indicated, sales taxes are the largest source of personal tax revenue in 25 states. Second, the tax reform act substantially reduced the proportion of voters who will itemize their tax returns. This is due to the elimination of some deductions and to the increase in the standard deduction, the threshold level of deductions needed to become an itemizer. Third, the tax reform act reduced tax rates, thereby cutting the effective federal subsidy for those taxpayers who itemize.

The effect of this on the cost of state and local tax deductions is illustrated by a series of maps. Map 5.6 shows the change in the fraction of voters itemizing in each state. The map indicates that this change is substantial everywhere, with one voter in six switching from itemizer status to nonitemizer. The preceding results showed that the proportion of voters itemizing was a statistically significant indicator of the level of state and local taxes collected.

Map 5.7 evaluates the proportionate reduction in the federal subsidy of state and local tax collections. The map shows that roughly half of the subsidy which existed under old law is eliminated. Generally states in the North with progressive income tax systems fare the best, while



Map 5.6 Decrease in voters itemizing. (Map by Andy Mitrusi)



Map 5.7 Per capita change in federal subsidy of state and local taxes. (Map by Andy Mitrusi)

states which rely on sales taxes for their revenue fare the worst. The results in map 5.7 may be viewed as overly dramatic. In terms of the weighted average price of revenue, a decline in the federal subsidy of 50 percent typically means a rise in the price from 85 cents to 92.5 cents. Thus, even the dramatic reductions in the federal subsidy should be interpreted as price increases on the order of 10 percent.

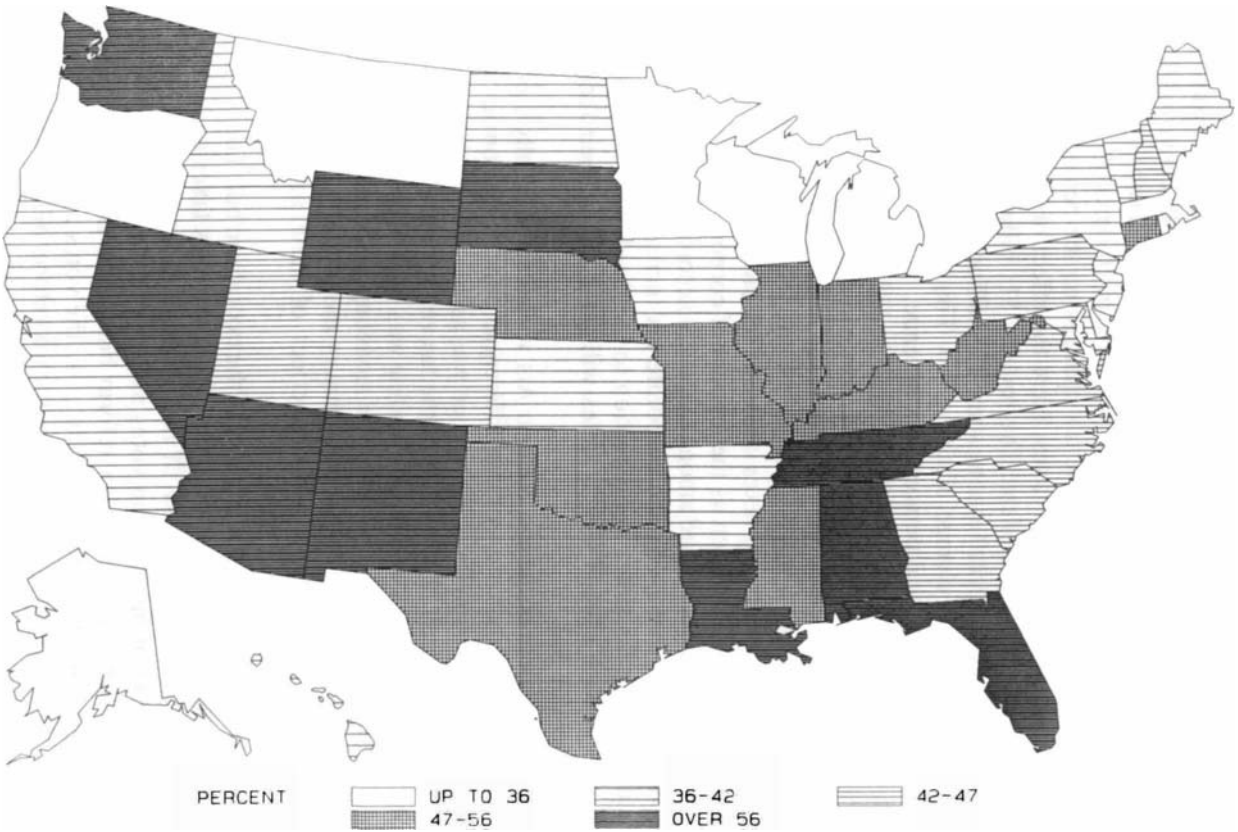
Map 5.8 shows the effect of the tax changes on the per capita level of federal subsidy of personal taxes. Here the effect of the tax reform is shown as much more modest. The roughly $11 billion reduction in the federal subsidy is spread among some 230 million people, producing an average per capita change of about $50. This amounts to about 3 percent of state and local personal tax revenue.

Map 5.9 shows the per capita decrease in federal income taxes in the various states. As the map shows, some states will show net tax increases. This is because the bill is revenue neutral overall. Personal taxes are cut while corporate taxes are increased. In this study, the difference between personal taxes under the old law and personal taxes under the new law was taken as the amount of corporate tax increase. This increase was apportioned among taxpayers according to the amount of dividends they received. The corporate tax increase was therefore allocated among the states in proportion to the dividends received by taxpayers in each state. Fully 23 states will see a rise in their federal taxes under this bill.

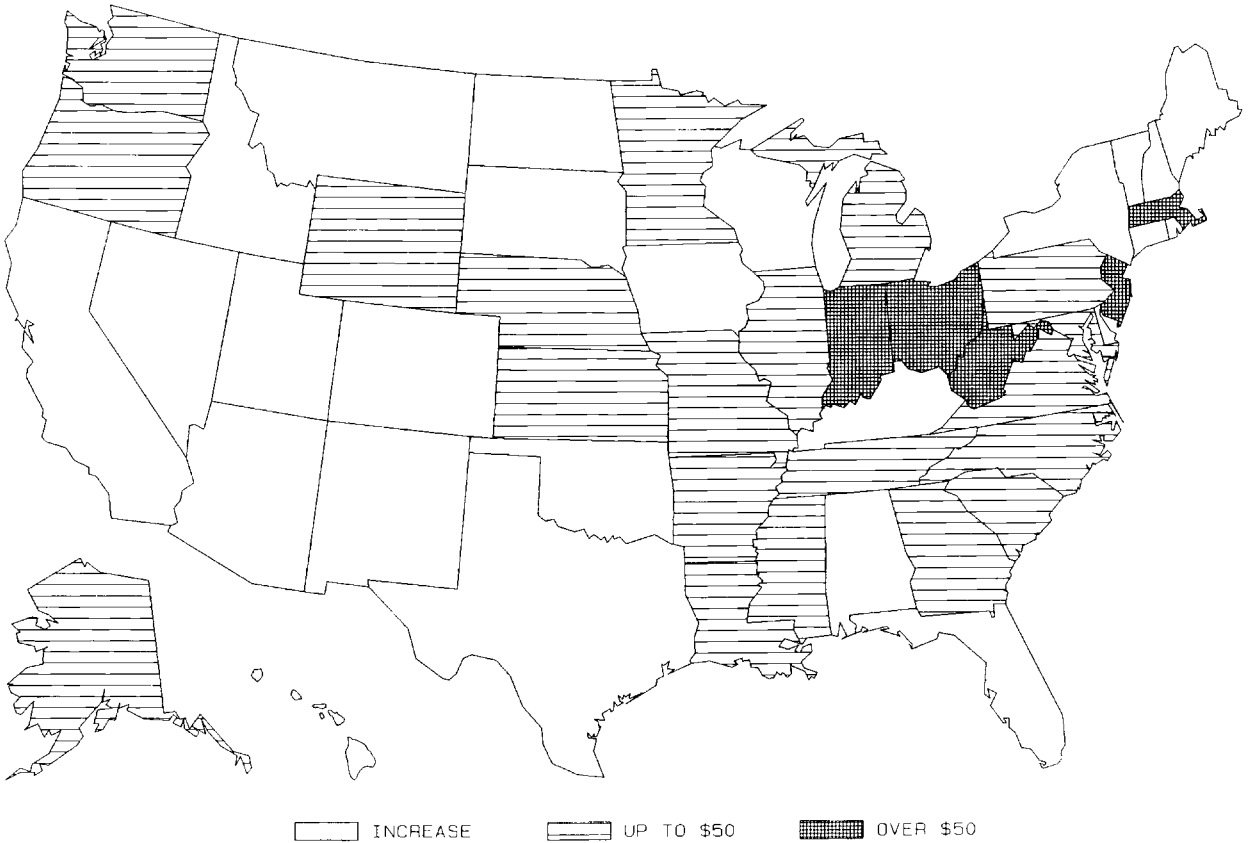
Clearly the effect of the Tax Reform Act varied substantially among the states. Several indicators of this differential effect were considered. The primary motivation for congressmen was assumed to be the impact on their states overall. The impact of the tax reform bill on the cost of raising revenue for state and local spending was viewed as a secondary, "special interest" concern. A two-stage modeling procedure was therefore undertaken, first to obtain the primary motivations for congressional voting, and then to add the effect of state and local tax deductibility.

First, we constructed a voter model of the tax reform bill. The NBER TAXSIM model was used to compute each taxpayer's taxes under the old law and under the new law. If a taxpayer's taxes declined by at least 0.2 percent of income, the votes assigned to that taxpayer were counted as voting yes on the tax reform bill. If the taxpayer's taxes increased by at least 0.2 percent of income, the votes assigned to that taxpayer were counted as voting no on the tax reform bill. Other voters were assumed to abstain. The votes were tabulated on a state-by-state basis for comparison with the votes of the congressional delegation.

The second model of the impact of the tax bill was the ratio of new tax revenue to old tax revenue. For this purpose two measures were devised: the change in personal taxes only, and the change in personal taxes when the added corporate tax was imputed to individuals.



Map 5.8 Decline in federal subsidy of state and local taxes. (Map by Andy Mitrusi)



Map 5.9 Per capita decrease in federal taxes. (Map by Andy Mitrusi)

Congressional delegations were divided along party lines. The dependent variable was the fraction of the congressional delegation voting against the tax reform bill. This fraction was regressed on various combinations of the variables described above. As the tax reform bill was largely a committee compromise bill, the members of the tax-writing committees were not counted in measuring the fraction of the delegation voting on the bill.

The voting of Republican congressional delegations was not explained in a statistically significant manner by any of the variables, either separately, or in combination. In view of the distributional effects of the tax bill, constituent pressure would be likely to incline Republican voters to oppose the tax bill. In addition, Republicans were generally excluded from the tax-writing process under the majoritarian rules of the House of Representatives. On the other hand, Republicans were under pressure from the president to support the bill. Republican voting was therefore determined more by conflicting political pressure than by the economic variables considered here.

The voting of Democratic congressional delegations was explained by the economic impact variables, although the results were not clear-cut. Democrats' opposition to the tax bill was positively correlated with the rise in taxes in their state. Generally, a 1 percent rise in the ratio of new taxes to old taxes increased opposition in the congressional delegation by about 3 percent. Democrats were more sensitive to the change in personal taxes alone, than the change in taxes which included the "pass-through" of the corporate tax increase. A 1 percent increase in personal taxes reduced support by 3.2 percent, but a 1 percent increase in total taxes reduced support by only 2.8 percent. At the margin, the corporate tax increase pass-through had very little effect on Democrats' voting behavior. This may reflect either a belief in the "corporate veil" or an economic expectation that the pass-through was not paid by the constituents that Democrats represent.

Surprisingly, the voter referendum variable was negatively correlated with the vote of the congressional delegation. Generally, a 1 percent increase in the opposition to the tax reform among the voters decreased opposition among the Democratic congressional delegation by about 1.6 percent. The standard errors on these coefficients were marginal to insignificant, however, ranging from 50 to 70 percent of the parameter estimate.

Three explanations for this phenomenon are possible. First, majorities supported the tax reform bill in the TAXSIM referendum in all 50 states. Thus, a median voter model would suggest that an increase in marginal opposition would have no effect on the outcome. Second, given the distributional considerations of the tax reform bill, opposition was likely to be concentrated among constituents supporting the other

party. Finally, voter surveys at the time indicated that most voters thought their taxes would go up, in contrast to the findings of TAXSIM. This would indicate that the TAXSIM referendum procedure did not reflect the underlying views of constituents, regardless of whether it was TAXSIM or the constituents who were in error.

Those models which produced statistically significant variables for explaining the behavior of Democratic congressional delegations were used to see if changes in the state and local tax situation had any effect. Changes in the likelihood of itemizing, in the average price facing voters, and in the weighted average prices of personal and total taxes were tried. None produced statistically significant results. Generally the standard errors were five to ten times the parameter estimates. Nor was any consistent sign discernible on the results. It is reasonable to conclude therefore, that the effect of the tax reform bill on state and local taxes had very little impact on congressional voting. This is particularly true about the effect of the tax reform bill on the price of raising state and local revenue. This is a surprising result in light of the intense lobbying on this matter by state and local public officials and public employee unions.

5.5 Conclusion

The results presented here provide a number of conclusions regarding the effects of state and local tax deductibility and the mechanism by which this is transformed by representative governments:

- The level of state and local spending is significantly affected by deductibility.
- The effect of deductibility is stronger on voter-based measures than on aggregate measures of cost.
- Income tax collections per capita were quite sensitive to the price of raising revenue. Low prices were associated with increased use of income taxes.
- Property taxes were insensitive to price, but were closely related to personal income.
- Sales taxes were not easily explained by economic variables and appear to be a residual form of revenue.
- Congressional voting seems more influenced by aggregate effects than by voter-based measures, unlike state and local spending.

Given the substantial changes in the value of federal deductibility of state and local taxes, future researchers have the prospect of sufficient variability in time-series data to test a number of hypotheses suggested by the cross-sectional data presented here.

Note

1. Turnout by income group was computed using exit poll information published in *Public Opinion* (December 1984–January 1985) and compared with the distribution of income on tax returns using TAXSIM.

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Comment Daniel Feenberg

Because the publication version of this paper answers the more significant points raised in the original discussion these comments are limited to a few minor points.

First, in the regressions of state and local tax revenues on their after federal tax price Lindsey adopts improved instruments for the obviously endogenous tax price terms. These improvements take into account the potentially deductible expenses of the nonitemizer and provide an increase in efficiency over simpler instruments used by Feldstein and Metcalf. The statistically significant results are certainly

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welcome but the new instruments are not required for unbiased coefficient estimates. While the instruments used by Feldstein and Metcalf are certainly biased estimates of actual tax prices, this would not, in and of itself, lead to biased coefficients in the second stage of the regression, as the paper implies.

Given the relatively few degrees of freedom available and the plausibility (to me) of the results presented in table 5.1, I hesitate to suggest additional explanatory variables, yet the religious composition of states is readily available and might be an important determinant of the taste for public spending.

The regression predicting the voting behavior of Democratic congressmen on the Tax Reform Act of 1986 (TRA) is easily the most surprising (and interesting) result in the paper. In the regressions each state is an observation and the dependent variable is the proportion of Democratic representatives voting for the act. Lindsey calculates the number of voters in each state whose taxes will be raised or lowered significantly by the TRA and holds a mock referendum. The referendum result however has no explanatory power. Nor does the effect of the TRA on the after federal tax price of state and local revenues seem to have any effect on congressmen. The only effect seems to come from the TRA's effect on per capita federal tax liabilities. The obvious conclusion is that the congressmen were responding to regional interests while ignoring class interests normally thought to be very powerful. This result can be questioned on a number of grounds, including omitted variables, the presence of strategic voting and logrolling, the use of an inappropriate linear probability model, and the absence of formal hypothesis testing, but it remains a thought-provoking result.