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DOES DEDUCTIBILITY INFLUENCE LOCAL TAXATION?

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ABSTRACT

Recent proposals to reform the U.S. tax code all contain significant reforms of the current provision allowing for the deductibility of state and local taxes.

This paper examines the effect of deductibility reform on the revenue decisions of the largest U.S. cities. The analysis of eight alternative reforms concludes: (1) total taxes change very little in the long-run, falling at most by 13% and, for many cities, even rising slightly; (2) fees and license revenue (predominantly a tax on firms) generally fall, in some cases by 30% or more; (3) the net effect on total revenues (tax plus fees) is generally small, never declining by more than 12% even with full loss of deductibility; and (4) policies to offset city revenue losses are effective in neutralizing the negative effects of deductibility reform.

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Does Deductibility Influence Local Taxation?

by

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For the first time since the adoption of the income tax in 1913, the federal government is considering a major, fundamental overhaul of the United States tax code. Members of Congress from both parties and the Reagan Administration have offered reform proposals which greatly simplify the present tax system, while also advancing, it can be argued, the dual objectives of economic efficiency and tax equity. All reform proposals contain changes in the federal tax law which may have important implications for the financing of state and local governments. Foremost among these changes is the removal, fully or in part, of the current deductibility of state and local taxes from household income when calculating federal tax payments. There is tentative evidence (Zimmerman, 1983; Noto and Zimmerman, 1984) to suggest the present deductibility of state-local taxes may stimulate the provision of state-local government services by providing a subsidy to state-local taxation. There is more conclusive evidence (Rock, 1984) to show that the deductibility of state-local taxes reduces the progressivity of our overall (federal-state-local) tax system. If we were to remove the federal deductibility of state-local taxes we might then observe a smaller, and possibly more efficient, state-local public sector as well as a more progressive combined tax system.

The purpose of this research is to examine as carefully as current evidence allows the effects on local finance of federal and state deductibility of local taxation. The analysis first estimates the impact of past changes in federal and state deductibility on the decisions of our largest cities to use property, sales, and income taxes as well as user fees and licenses for the financing of public services.[1] The sample for this econometric analysis is the forty-one largest U.S. cities (excluding Washington, D.C. and Honolulu because of their unique financial relationship to federal and state governments, respectively) for the twenty-one fiscal years, 1960-1980. A data base of this breadth and depth is needed if we hope to accurately reveal the influence of such a sporadic policy change as federal and state tax deductibility.[2] Given econometric estimates of city responses to changes in federal and state deductibility, the analysis then predicts the effects on the level and structure of local finance of a variety of alternative federal reforms for the deduction of state and local taxes. Reforms considered include the Administration's initial proposal for full removal of deductibility, proposals (such as the Kemp-Kasten and Bradley-Gephardt tax reform bills) for selective removal, and finally, a series of compromise proposals which remove deductibility but offer increased revenue-sharing aid or percentage tax credits for local taxes in hopes of softening the "blow" to after-tax incomes or public services received by local taxpayers.

II. Deductibility and the Local Decision to Tax

Cities budget subject to constraints. Legal constraints influence local finance by defining the fiscal choices available to cities. Economic constraints set the limits to how many dollars can be allocated along each dimension of choice. Political constraints detail the process by which dollars are so allocated. Together the three constraints set the local budget. I will focus here on only one aspects of the local public budget — the revenue decision — and the effects of tightening one of the constraints — the economic constraint — through the removal of deductibility for local taxes.

For this analysis I will assume that the level and structure of local revenues are set by a majority rule process involving two or more coalitions of voters. Since the budgetary process will generally require decisions on several policy dimensions the usual median voter model will not apply.[3] Rather, city budgets will emerge from a bargaining process among the relevant voter coalitions. Ideally, we would like to specify and estimate a structural model of this bargaining process, unraveling coalition preferences and the political weights in the process. That task is beyond us here.[4] We can, however, specify a reduced-form model of local budgeting which, subject to the usual caveats regarding structure stability, will allow us to estimate the effects on local finance of changes in deductibility. In section III, I will outline one possible structural model of local finance which helps to rationalize the observed reduced-form estimates.

A generalized, reduced-form specification of revenue allocations by city i in year s can be specified as:

$$(1)\ T_{is} = \alpha_{is}^{(T)} + \beta_{is}^{(T)} X_{is} + \varepsilon_{is}^{(T)} ,$$

(T = Total taxes per resident);

$$(2)\quad t_{is}^{(r)} = \alpha_{is}^{(r)} + \beta_{is}^{(r)} X_{is} + \varepsilon_{is}^{(r)} ,$$

$(t^{(r)}$ = taxes per resident from tax r);

$$(3)\quad F_{is} = \alpha_{is}^{(F)} + \beta_{is}^{(F)} X_{is} + \alpha_{is}^{(F)} ,$$

(F = Fees and licenses per resident);

$$(4)\quad R_{is} = \sum t_{is}^{(r)} + F_{is} = T_{is} + F_{is},$$

(R = Total, non-debt revenue per resident).

Equations (1) to (3) are behavioral equations in which total taxes (T), individual taxes $(t^{(r)}, r = 1 \ldots)$ and fees and licenses (F) are seen to depend upon the vector of legal, economic, and political constraints (X_{is}). Equation (4) is a budget identity which defines total non-debt revenue (R) as the sum of taxes and fees.[5]

Included in the vector X_{is} as legal constraints are local city spending obligations for education (DED = 1 if the city has primary responsibility for education, 0 otherwise), and welfare (DWL = 1, if the city has primary responsibility for AFDC welfare, 0 otherwise) and state prohibitions on the use of local taxes other than property taxation (DI = 1 if city can use the income tax, 0 otherwise; DSS = 1 if city can use selective sales taxes, 0 otherwise; and DGS = 1 if city can use a general sales tax, 0 otherwise).[6] In addition, states often place restrictions on the rate of local property taxation; either as a limit to the <u>nominal</u>, or mill (tax per $1000 of assessed value), rate or (more recently) as a limit to the <u>effective</u> (or market value) rate. The more common state-imposed limit to nominal rates is specified as the inverse of the state mill rate limit (RLIM) while the state limit to the effective property tax rate is specified as a simple 1 (if an effective rate limit applies) or 0 (if no effective rate limit applies) dummy variable (LEVYLIM).[7]

The economic constraints included in X_{is} are per capita city income after state and federal taxes but before local taxation (CINC), federal and state aid from categorical (but not open-ended matching) aid programs (CAID), federal aid from general revenue-sharing (RSAID), and a city cost-of-living index (PI).[8] Also included in the vector X_{is} as an economic constraint will be the ability of a city to export a portion of its local tax burden either by taxing non-residents or by using federal and state tax code provisions which allow the deduction of, or credits for, local taxation. Local tax exportation through non-resident taxation or deductibility will in effect lower the "price" to residents of raising local revenues; the direct burden of local taxes is reduced by the share of the burden exported.

To make this notion of tax exportation precise, and to allow us to test for the effects of deductibility on local finance, I have specified a variable called the <u>burden price</u> of taxation.[9] A dollar raised from local tax t will reduce resident incomes not by $1, but rather by $\tau^{(r)}$ dollars ($\tau^{(r)} \leq 1$), where $\tau^{(r)}$ is called the burden price of tax r and is defined by:

$$\tau^{(r)} = (1 - \delta^{(f)} p^{(f)} q^{(f)} - \delta^{(s)} p^{(s)} q^{(s)} - \gamma^{(r)})(1 - \theta^{(r)}),$$

where $\delta^{(f)} = 1$ if the local tax is claimed as a federal deduction, 0 otherwise; $\delta^{(s)} = 1$ if the local tax is claimed as a state deduction, 0 otherwise; $p^{(f)}$ and $p^{(s)}$ equal the portion of the local tax which can be deducted against federal or state income taxes, respectively; $q^{(f)}$ and $q^{(s)}$ are the taxpayer's marginal federal and state income tax rates, respectively; $\gamma^{(r)}$ is percent of the local tax dollar which can be credited towards federal and/or state taxes; and $\theta^{(r)}$ is the portion of tax r paid directly by non-residents. The burden price will differ across taxpayers in the same locality as δ, q, p and γ differ; $\theta^{(r)}$ will be identical for all taxpayers within a given city.

The actual specification of $\tau^{(r)}$ for each of the taxes in this study will be a weighted average of individual $\tau^{(r)}$'s across taxpayers from the city's 25th percentile income level (weight = .25), from the city's 50th percentile income level (weight = .50), and from the city's 75th percentile income level (weight = .25). Separate values of δ (defined as the percent of households with the given income who itemize their deductions),[10] q (defined as the effective marginal federal and state tax rate for the given income),[11] and γ (defined as the rate of state tax credit for the given income)[12] are defined for each local tax for each income class; p is always uniform for all income classes in a given state (either 0 or 1). The deductibility expression $(1 - \delta^{(f)}p^{(f)}q^{(r)} - \delta^{(s)}\ p^{(s)}\ q^{(s)} - \gamma^{(t)})$ is calculated first for each income class, and then the weighted average across the three income classes is calculated for property taxation (denoted BTPROP), for general sales (BTGS), for selective sales (BTSS), and for income taxation (BTINC). The non-resident share of a local tax $(\theta^{(r)})$ will also vary by tax and is defined for property taxation as the percent of city property assessed as commercial-industrial (PCI), for general sales taxation as the percent of city taxable general sales purchased by non-residents (PNRGS), for selective sales taxation as the percent of city taxable selective sales purchased by non-residents (PNRSS), and for local income taxation as the percent of city wages earned by non-residents (PNRY).[13] The city's average burden price for each tax, $\tau^{(r)}$, is then the simple product of its deductibility component and one minus the non-resident share: τ^{PROP} = BTPROP(1 - PCI), τ^{GS} = BTGS(1 - PNRGS), τ^{SS} = BTSS(1 - PNRSS), and τ^{INC} = BTINC(1- PNRY). I shall test for the effects of the $\tau^{(r)}$'s on the level and mix of local taxation and (given the reduced form focus of this analysis) for the possible distinct effects of the deductibility and non-resident share components of the $\tau^{(r)}$'s.

For completeness, we must recognize that in addition to taxes, local fees and licenses may also be exported to non-residents. While fees and license are not deductible ($p^{(f)} = p^{(s)} = 0$) nor supported by credits ($\gamma = 0$), they may be paid by non-residents. I denote this non-resident share of fees as PNRF.[14] The residents' share of fees (1-PNRF) will be included as element of the vector X_{is}.

As a final comment on the specification of the burden price of local finance, we must also note that the non-resident share of revenues includes not only revenues paid today by those in other jursidictions but may include the present value of revenues paid by future residents which go to support today's services. How do future taxpayers subsidize current services? Two mechanisms are available: by underfunding public employee pensions and by "rolling-over" short-term debt.[15] Unless local land markets or labor markets capitalize these debts (and there is no good evidence that they do or do not), future residents will bear a fraction of the current costs for city services. A precise estimate of the fraction of local revenues paid by future taxpayer's is not possible, but I do include in X_{is} a likely determinant of this share: the difference between the national rate of return on 6-month Treasury Bills and the city's interest rate for short-term debt, discounted by the after-tax rate of return from 6-month T-Bills for the average income resident (ARBINT). ARBINT measures the arbitrage advantage of holding city dollars in interest bearing accounts and financing today's public services through borrowing. As ARBINT rises, the non-debt sources of current period revenues — taxes and fees — are likely to decline if shifting to future residents occurs.[16]

The political constraints on local revenue choices are specified by two variables which measure the relative size of residential voting coalitions — the percent of city households whose income exceeds the national 75th percentile income level (PCRICH) and the percent of city households whose income is below the national 25th percentile income level (PCPOOR) — one variable designed to measure the relative mobility of city tax base to the suburbs — the log of the ratio of city to suburban income (LRCSI)[17] — a time trend (YEAR) and a city "fiscal crisis" dummy variable (CRISIS = 1, for years after the New York City crisis 1975 to 1980, 0 for prior years)[18] to capture any sytematic shifts in voter or bond market preferences for revenue levels or mix, and, finally, a vector of city dummy variables to control for each city's unique political environment and the city's status quo budget.

While these variables are a reasonable first step to specifying the structure of revenue choice, they surely do not capture all relevant economic and political forces. It is assumed that what factors have not been systematically specified will have only a stochastic influence across cities and time. The error structure of the revenue model therefore allows for cross-equation correlation of the error terms — political or economic "shocks" which influence taxes, or tax mix, are likely to influence fees as well — and permits a lagged adjustment to these "shocks" through a first-order autoregressive process unique to each revenue instrument. Thus,

$$(5) \qquad \varepsilon_{is}^{(.)} = \rho(\cdot)\ \varepsilon_{is-1}^{(.)} + e_s^{(.)},$$

where, $E(e_s^{(.)}, e_{s-1}^{(.)}) = 0$, but

$$E(e_s^{(T)}, e_s^{(F)}) \neq 0,\ E(e_s^{(r)}, e_s^{(r)}) \neq 0,\ E(e_s^{(F)}, e_s^{(t)}) \neq 0.$$

The model is estimated by generalized least squares allowing for tax-specific autocorrelation and for the cross-equation correlation of errors. When estimating this system of revenue equations, the total tax identity $\sum_r t^{(r)} = T$ allows us to either estimate all tax equations and calculate T as the sum of each $t^{(r)}$, or to estimate T and all but one of the $t^{(r)}$ equations calculating the omitted individual tax as a residual. The latter strategy is adopted here. Revenue systems involving total taxes, property taxes, general sales taxes, selective sales taxes, income taxes, and fees and licenses are estimated. The omitted tax category is a residual of miscellaneous specialized city taxes which is never more than five percent of city revenues.[19] All financial variables and city income are measured in real dollars (deflated by PI) per capita.

III. City Revenue Behaviour

A. Does Deductibility Matter?

Tables 1 and 2 summarize the central results of estimating the reduced form revenue model. Table 1 presents full sample (all cities for all years) estimates of the effects on city revenues of the legal, economic, and political constraints to local fiscal choice. The dependent variables for this full sample analysis are total taxes per capita (T), fees and licenses per capita (F), property taxes per capita ($t^{(PROP)}$), and a new variable combining revenue per capita from each of the major taxes (income, general sales, selective sales) other than property (devoted as $t^{(INC/SAL)}$). This aggregation of revenues from the major, non-property taxes was required because not all cities are allowed to use each of the individual taxes over the whole sample period. The tax burden price corresponding to $t^{(INC/SAL)}$ was defined as the weighted average (where the weights equal the share of $t^{(r)}$ in $t^{(INC/SAL)}$, possibly zero) of each of the individual $\tau^{(r)}$'s. This weighted average tax price is denoted as $\tau^{(INC/SAL)}$ in Table 1.

I also examine the separate effects of the weighted average of the taxes' deductibility components (denoted BTINC/SAL) and non-resident components (denoted (1-PNRINC/SAL)). The omitted revenue equation is for "other taxes" which accounts for only 1.2% of total own revenue for the full sample.

Before examining the effects of deductibility on city fiscal choice, it is instructive to summarize briefly the influence of the legal and political constraints as well as the effects of the economic variables income, aid, and relative prices. The constraints influence city revenues largely as expected. Cities responsible for public education (DED) have higher taxes, predominantly property taxes.

Table 1
Local Revenue Behaviour

	T	t^{PROP}	$t^{INC/SAL}$	F
<u>Legal</u>				
DRD	69.66* (10.26)	63.21* (8.02)	2.78 (5.25)	3.53 (9.01)
DWL	-13.05* (7.26)	-12.54* (5.67)	-.37 (3.73)	-3.35 (6.38)
DI	n.a.	n.a.	n.a.	n.a.
DSS	-15.72* (4.54)	1.02 (3.54)	-14.92* (2.29)	-.40 (4.04)
DGS	-15.08* (4.79)	1.30 (3.73)	-13.45* (2.41)	-6.34 (4.26)
RLIM	-1.61 (53.62)	4.85 (41.67)	11.06 (26.88)	1.85 (48.18)
LEVYLIM	-3.59 (2.66)	-1.45 (2.05)	-1.41 (1.30)	-1.79 (2.44)

	T	τ^{PROP}	$\tau^{INC/SAL}$	F
<u>Economic</u> CINC	.026* (.004)	.017* (.003)	.007* (.002)	.005* (.003)
CAID	.026* (.028)	-.026* (.111)	-.009* (.07)	.090* (.134)
RSAID	-.019 (.028)	-.018 (.111)	-.12 (.07)	.122 (.134)
PI	-20.81* (7.26)	-24.04* (5.71)	-10.08* (3.94)	-10.37* (6.35)
τ^{PROP+}	-25.18 (18.62)	-19.66 (14.60)	-16.68* (9.84)	9.27 (15.87)
or				
BTPROP	40.05* (21.12)	20.89 (16.28)	1.95 (10.20)	-14.08 (19.67)
(1-PCI)	-60.70* (19.37)	-41.37* (15.42)	-27.38* (10.99)	22.19 (15.99)
$\tau^{INC/SAL+}$	2.60 (2.87)	-4.01* (2.21)	7.26* (1.38)	6.43* (2.67)
or				
BTINC/SAL	4.69 (6.90)	1.03 (5.33)	4.49 (3.38)	-5.20 (6.35)
(1-PNRINC/SAL)	1.96 (2.63)	-3.67* (2.03)	6.20* (1.27)	6.81* (2.46)
ARBINT	-71.76* (25.28)	-62.49* (19.24)	-4.90 (11.58)	11.69 (25.05)
(1-PNRF)	-2.47 (2.61)	.64 (1.98)	-1.07 (1.18)	4.89* (2.61)

	T	τ^{PROP}	$\tau^{INC/SAL}$	F
<u>Political</u>				
PCRICH	-1.25 (.81)	-1.92* (.65)	.98* (.49)	-.49 (.76)
PCPOOR	1.16 (1.21)	-.60 (.97)	2.63* (.75)	-.17 (.97)
LRCSI	-11.19* (3.47)	-6.80* (2.64)	-2.46 (1.59)	-2.81* (3.42)
YEAR	2.54* (.59)	1.15* (.47)	1.85* (.34)	1.72* (.50)
CRISIS	.68 (2.22)	2.06 (1.69)	-.71 (1.03)	1.11 (2.16)
City Dummy Variables	n.r.	n.r.	n.r.	n.r.
ρ	.75* (.02)	.78* (.02)	.90* (.02)	.64* (.03)
R^{-2}	.908	.874	.606	.821

Standard errors reported in parentheses. An * indicates the estimated coefficient is statistically significant from 0 at .1 level or better, two-tailed t test.

n.r. = Not reported. Available from the author upon request.

n.a. = Not applicable as variable is omitted from regression.

+ = Results reported for τ^{PROP} and $\tau^{INC/SAL}$ are from separate regressions, including all variables except BTPROP, (1-PCI), BTINC/SAL or (1-PNRINC/SAL).

Cities with responsibility for welfare (DWL = 1, for Baltimore, Boston to 1970, Denver, Indianapolis since 1971, New York City, Norfolk, and San Francisco) are the larger, older cities. Real taxes per capita (and possibly services) are lower, with property taxes enjoying most of the reduction. Tax relief is given to homeowners to compensate for the added burden of paying for at least a part of welfare ontlays. Cities restricted to general sales taxes (DGS) and/or selective sales taxes (DSS) raise less revenue than cities with access to an inocme tax (DI). Tax access clearly has a revenue effect. Nominal mill rate limits (RLIM) have no statistically significant effect on revenues as cities adjust assessment rates or vote to override the limit. An effective rate limit on property taxation (LEVYLIM) does reduce revenues but the effect is neither quantitatively nor statistically significant in our sample cities.

Of the political constraint variables, a larger pool of rich households (PCRICH) seems to reduce taxes overall and property taxes in particular; the revenue mix is biased towards sales taxation and wage income taxation as PCRICH rises. A larger pool of very low income families marginally increases total taxes, and particularly general sales and income taxes. The results suggest the possibility of a majority rich-poor coalition which lowers property taxes, increases services, and shifts the tax burden to the middle class (and possibly firms) through the taxation of wages and retail sales. There has been a steady annual (YEAR) upward trend in real city revenue from all sources, a trend which has not been offset by the effects of the New York City fiscal crisis or by the apparent increased taxpayer awareness of city fiscal performance in the 1975 to 1980 period

(CRISIS). The measure of middle class exit to the suburbs (LRCSI) has the expected negative effect on taxes, notably property taxation. Economic competition appears to be a more effective check to the growth of large city revenues than legislative constraints, at least as they are now fashioned (RLIM, LEVYLIM).

Relaxing the public sector's economic constraint through an increase in residential income (CINC) or by reducing the costs of goods and services in the region as a whole (PI) both increase the city's own revenues and public services. An increase in the city's grants-in-aid from categorical programs (CAID) or from general revenue -sharing (RSAID) results in only marginal tax relief; almost all aid is spent on public services in these large cities. The variable ARBINT measures the attractiveness of deferred financing and has a negative effect on property taxes and on total taxes; the behavioral response measured by the elasticity of T with respect to ARBINT is only -.02, however. The residential share of fees and licenses (1-PNRF) has no statistically or quantitatively important effect on taxation; when significant in the fees equation the elasticity is only .08.

Overall, the legal, economic, and political constraints have plausible effects on city revenue behavior. What are the specific effects of deductibility? Tables 1 and 2 detail the estimates of the effects on city financing of changes in tax burden prices, and explicitly, the deductibility components (BTPROP, BTINC/SAL, BTSS, BTGS, and BTINC) of those prices. Table 1 illustrates an important result; the deductibility component and the non-resident component of tax burden prices often have opposite, and statistically significant, effects on city revenues. The differences were most noteable for property tax burden prices; deductiblity (BTPROP) has a positive effect while the share of taxes borne by residents (1-PCI) has a significant negative effect on local taxation: signs are reversed in the fee equation. The two components of $\tau^{(PROP)}$ do not behave as one, as the initial specification suggested.[20] This result was true not only for the full sample regressions reported in Table 1, but for the various subsample regressions as well. As I shall argue below (Section B) there are good reasons for these differences, particularly in a reduced form model such as is estimated here.[21] Since our central concern is predicting the effects of the deductibility component on financing, I focus my discussion on these coefficients. Further, all policy simulations will use these direct estimates.

Table 2 summarizes the influence of deductibility provisions on local finance both for the full sample and for the three subsamples of cities. Subsample 1 consists of cities who only have access to property taxes, selective sales taxes, and fees; subsample 2 consists of cities who only have access to property taxes, selective sales taxes, general sales taxes and fees; and subsample 3 consists of the remaining cities who have access to property, selective sales, income taxes, perhaps general sales, and fees. The elasticities of total taxes (T), each available individual tax, ($t^{(r)}$), fees (F), and total revenues (T + F) with respect to changes in deductibility are reported in Table 2. The results show that the removal of deductibility (BTPROP, BTSS, BTGS, and BTINC all rise towards 1) will increase taxes (BTSS in subsamples 1 and 3 and BTINC in subsample 3 are the exceptions), generally reduce fees, and, as often as not (BTSS and BTINC are the significant exceptions), increase total city revenues.

Table 2
Tax Deductibility and Local Finance:
Revenue Elasticities

	T	$t^{(PROP)}$	$t^{(INC/SAL)}$	$t^{(GS)}$	$t^{(SS)}$	$t^{(INC)}$	F	$(T + F)^{+}$
<u>Full Sample</u>								
BTPROP	.33* (1.89)	.26 (1.28)	.05 (.19)	n.a.	n.a.	n.a.	-.23 (.71)	.14
BTINC/SAL	.04 (.68)	.01 (.19)	.12 (1.33)	n.a.	n.a.	n.a.	-.09 (.82)	-.002
<u>Subsample 1</u>								
BTPROP	.94* (3.42)	1.05* (3.45)	n.a.	n.a.	-1.09* (2.05)	n.a.	.42 (.85)	.79
BTSS	-.49* (2.20)	-.51* (2.05)	n.a.	n.a.	-.04 (.09)	n.a.	-.46 (1.16)	-.48
<u>Subsample 2</u>								
BTPROP	-.20 (.25)	.14 (.14)	n.a.	-2.36 (1.44)	4.09* (2.80)	n.a.	-3.63* (2.79)	-1.40
BTSS	.36 (1.11)	.51 (1.30)	n.a.	-.89 (1.37)	.23 (.39)	n.a.	1.22* (2.32)	.66
BTGS	.68 (.82)	-.52 (.51)	n.a.	3.79* (2.24)	-4.58* (-3.03)	n.a.	.58 (.43)	.65
<u>Subsample 3</u>								
BTPROP	1.16* (3.02)	1.07* (2.35)	n.a.	n.a.	-1.07 (.92)	2.15* (3.31)	.79 (.76)	1.04
BTSS	-.30 (.77)	.27 (.58)	n.a.	n.a.	-4.30* (3.66)	1.02 (1.49)	-.77 (.73)	-.45
BTINC	-.96 (1.31)	-1.97* (2.26)	n.a.	n.a.	6.55* (2.91)	-4.14* (3.22)	-2.64 (1.32)	-1.49

An * indicates the calculated elasticity is based upon a coefficient estimate which is statistically significant at the .1 level or better. The absolute value of the t statistic for each coefficient upon which the elasticity is based is given in parentheses below the reported elasticity.

+Calculated as the weighted (by shares) average of the separate elasticites for T and F.

n.a. = not applicable.

On their face these results are, I suspect, counter-intuitive. But two points need to be made. First, our intuition is about the short-run; the results reported here are equilibrium, long-run estimates of the effects of deductibility on revenues. There is a plausible long-run explanation for these results; see section III-B. Second, since the deductibility components all have mean values of .85 or higher (see Data Appendix), the selective removal of deductibility will imply at most an 18% increase in the relevant tax price variable (i.e., .85 to 1.0 is a change of 18% percent). The long-run effects of reform on total revenues (T + F) will be modest, therefore, ranging from a possible increase in revenues of 18% (BTPROP in Subsample 3) to a possible reduction of 25% (BTINC in Subsample 3). For most reforms now being discussed, the equilibrium revenue effects will be much smaller; see section IV.

B. Unraveling the Revenue Response: Short-Run Politics Meets Long-Run Economics

Dissecting the long-run, equilibrium response of city revenues to deductibility reform requires a three step argument. In step one, I argue that deductibility reform will have a selective effect on city taxpayers which will create pressure for upper income households to exit the center city for the suburbs. In step two, I outline the city's likely short-run response to that pressure as a readjustment of the local tax rates to favor the upper income classes. In step three, the long-run effects of these rate adjustments are described through the long-run rate-revenue schedule (the familiar "Laffer curve"). If cities are on the downward side of the long-run revenue schedule, then rate reductions to offset deductibility in the short-run may actually increase city revenues.

The removal of deductibility of state and local taxes will have selective effects on taxpayers within our cities. Only those who itemize will be directly affected. Evidence reveals these families to be the middle and upper income taxpayers, most often homeowners. The loss of deductibility will make local tax payments more expensive for these residents. The effect of this now more expensive local budget may be to drive the marginal (just indifferent) upper income families from the central cities to the suburbs. Exit will occur even though deductibility reform applies in the suburbs as well. The reason is the relatively pro-poor bias of city, as compared to suburban, public budgets; see Inman and Rubinfeld (1979).

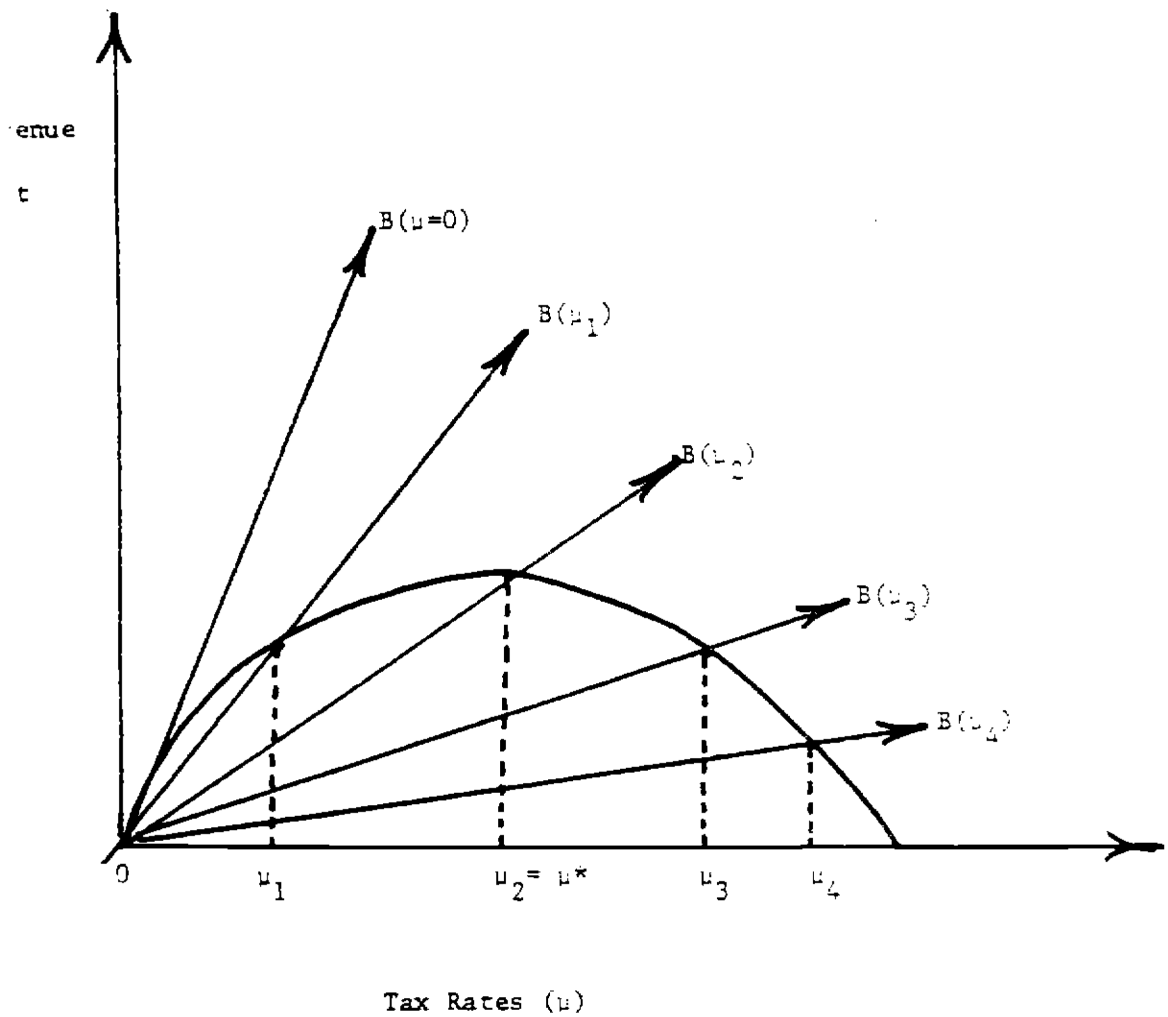
A simple example makes the point. Upper income families who live within the city make a transfer to lower income families which they would not make were they to live in the suburbs. Suppose the value of this transfer is $200 per year paid as city taxes. For families in the 30 percent tax bracket, (the typical itemizer), the net cost of the pro-poor subsidy is $140 (=$200 - deduction of $60). If the family prefers the city to the suburbs it must therefore derive a benefit from city living (above any public services received) of at least $140 — for example, lower commuting costs, excitment of city life, or perhaps the altruistic benefits of helping (or living with) the poor. The marginal (just indifferent) upper income family derives a net benefit of city living of exactly $140/year. Now remove the deductibility of local taxes. The net cost of the within city pro-poor transfer rises from $140/year to $200/year. Families who value city living less than $200/year will now (ignoring transaction costs) exit to the suburbs.

The potential loss of its middle and upper income taxpayers is a fiscal threat the city cannot ignore. The city has two possible responses: increase services to the upper income neighborhoods and/or selectively lower those taxes which fall most heavily on the rich and middle class. The political reaction will no doubt be a combination of the two, as cities attempt to balance the competing interests of the rich and poor.

The route to lower taxes, is of course, to lower the rates. In the short-run when the tax base in the city is relatively fixed, city revenues will fall. In the longer run, however, lower city tax rates may stimulate within city investment by existing households and firms as well as possible new firm locations, increased work effort, and added retail activity. The expansion of economic activity within the city in response to lower tax rates will increase the city's taxable base. In the long-run, the increase in base begins to offset the initial fall in revenues because of the rate reduction. If the base increase is large enough, revenues may actually increase. This long-run relationship between tax rates (μ) and revenues (t) (popularly called the "Laffer curve") is described in Figure 1. The long-run schedule is the trace of points along various short-run (fixed, or very inelastic base) schedules, where the tax-rate intersects its equilibrium short-run schedule for its given tax base. As tax rates rise ($0 < \mu_1 < \ldots < \mu_4$), tax base falls, and conversely. For each tax the more elastic is the tax base to rate changes, the lower will be the revenue maximizing rate μ^*.[22] Because of the long-run tax rate revenue relationship, a decline (increase) in rates may reduce (increase) revenues — if the initial rate is $0 \leq \mu < \mu^*$ — or increase (reduce) revenues — if $\mu^* < \mu \leq 1$. To understand the effects of deductibility reform we must know, therefore, on which side of the revenue-maximizing rate μ^* the city's tax structure now resides. I shall argue that it is likely cities are to the right of μ^* for property and sales taxation and to the left of μ^* for income (wage) taxation. This third and last step permits us to untangle the observed long-run effects of deductibility reform.

The city's decision to set a local tax is, of course, a political decision. Yet no city politican, it would seem, should rationally set rates beyond μ^*; he would lose both votes and revenues! Why then might $\mu > \mu^*$ for local taxes? The answer lies in the long-run elasticity of the local tax base and the time horizon of politicans relative to the time required to achieve a long-run tax base equilibrium. If the political time horizon is shorter than the

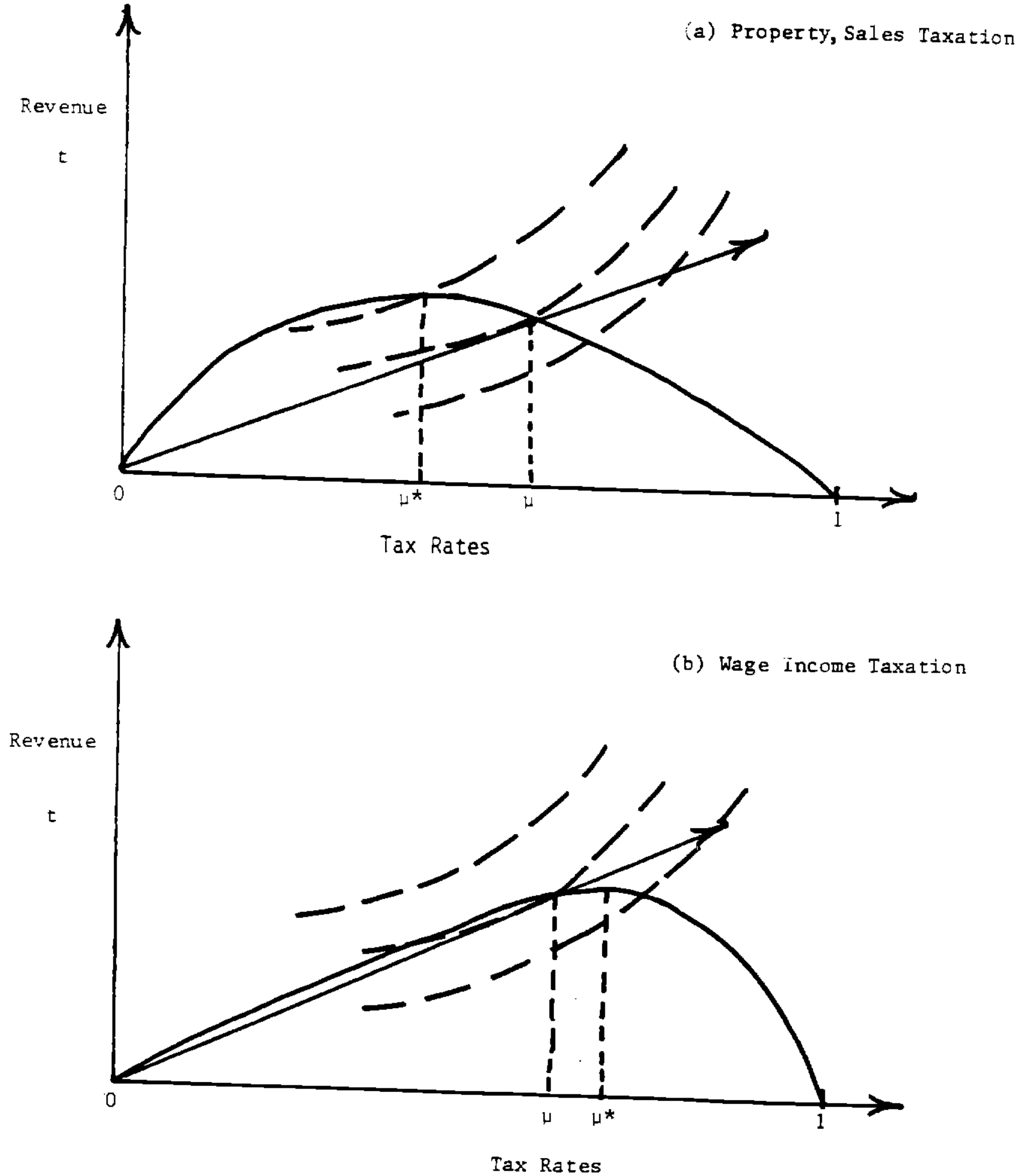
Figure ... Tax Rate-Revenue ...



economic adjustment process,tax rates to the right of μ^* are not only feasible but likely. Buchanan and Lee (1981) were the first to make this important point. Figure 2 illustrates two possible equilibria. The dashed lines in Figure 2 represent the elected officials' chances of re-election as a function of revenues (a "good" to be spent on services) vs. tax rates (a "bad"). As tax rates rise, increasing amounts of revenues are needed to offset the political losses from the rate increase; thus the political re-election curves bend upward. Higher re-election curves reflect preferred combinations of revenue and rates. The elected officials select that rate which maximizes their chances of re-election. The next election is generally only two years away and never more than four. Voter myopia ("what have you done for me lately") compresses a politican's time horizon still further.[23] As a consequence elected officials select that rate which is rational, subject to the short-run (fixed-base) tax rate-revenue schedule. The short-run revenue schedules are the (nearly) straightlines — denoted $B(\mu)$ — in Figure 1. It is feasible for the tax rate chosen subject to an always rising short-run revenue constraint to also be a long-run equilibrium on the downward sloping portion of the long-run revenue curve; for example $\mu_3 > \mu^*$ in Figure 2a.

It is also likely. For those local taxes whose tax bases are sensitive in the long-run to tax rate changes, the peak of the long-run schedule will occur at relatively low values of μ. Further, if politicans' re-election curves are "flat" — i.e., voters value targeted expenditures relative to general tax rate relief — we can well expect a tangency to the right of μ^*. Such cities will be caught

Figure 2: Political-Economic Equilibrium



in a "revenue trap" or "fiscal crisis" where increasing rates only reduce tax base and revenues in the long-run. Available evidence suggests that local property taxes and local general sales taxes are likely to have elastic tax bases.[24] Further, politicians in the larger and older cities which comprise our sample are likely to face "tight" expenditure needs and hence "flat" re-election curves between revenue (i.e., expenditures) and tax rates. If so, tax rate-revenue allocations such as those in Figure 2a result. For property and general sales taxation, an equilibrium tax rate $\mu > \mu^*$ is both feasible and plausible.

The available evidence on the elasticity of local income tax bases to rate changes suggest a relatively inelastic base.[25] If this is so, then the peak of the income tax revenue curve will result at relatively high local rates. The equilibrium tangency of the politicans' still "flat" re-election curves to the short-run revenue schedule may therefore occur to the left of μ^*; see Figure 2b. Thus for local income taxes, it is feasible and likely that $\mu < \mu^*$.

No systematic argument regarding tax base elasticity for the set selective sales taxes seems possible. This tax category includes numerous miscellaneous taxes which vary greatly across sample cities. Some of these taxes are likely to have elastic bases (tobacco, liquor, entertainment, hotels) while the tax base of others will be rate inelastic (public utilities). Cities' legal access to the individual taxes may be restricted as well. For some cities (those who use public utility taxes) $\mu < \mu^*$ is likely, while for others (those who tax consumption and entertainment) $\mu > \mu^*$ is more plausible.

What are the implications of this political economic view (i.e., "structural model") for interpreting our reduced-form estimates of the effects of deductibility reform on city revenues? First, the proposed model is long-run; since most of the variation in deductibility is cross-section variation, the econometric results are long-run results as well. Second, the model does help us to understand the possibly counter-intuitive results of deductibility reform. For the full sample results, a fall in property and/or income plus sales tax deductibility <u>stimulates</u> total taxes, particularly from property taxation. This result is explained by the political decision to lower tax rates to keep the rich and upper middle class itemizers within the city, a decision which, in the end, actually helps city revenues. It should be noted that in the <u>short-run</u> city revenues decline and services — most likely those allocated to the poor — are reduced. Note too, that as rates fall, city politicans are moved to a politically less preferred (lower chance of re-election) rate-revenue allocation.

The three sets of subsample results can also be understood in light of this model of short-run politics and long-run economics. For cities in subsample 1, the loss of property tax deductibility leads to a rise in property tax revenues as predicted. But selective sales tax revenues decline; the reason is most likely a combination of effects. Subsample 1 cities have access to only property and selective sales taxes. Lowering the property tax rate is a first priority. In the short-run, however, revenues and public services will decline and to offset, at least partially, this revenue loss selective sales tax rates may be increased. In the long-run, if $\mu > \mu^*$ for selective sales taxes (an elastic tax base), revenue will decline. (A similar story, but with tax roles reversed, can be told for an increase in

BTSS.) For cities in subsample 2, we observe a similar fiscal reaction to the loss of deductiblity of property taxation. As BTPROP is increased, property tax rates are reduced and long-run revenues increase. To offset the short-run revenue loss, general sales tax rates may be increased, but as cities are likely to be in the declining range of this tax's long-run revenue curve ($\mu > \mu^*$), general sales tax revenues decline as BTPROP rises. The tax rates for the selective sales taxes may rise or fall, but if they fall and $\mu > \mu^*$ for these taxes (see below) then revenue $t^{(SS)}$ will rise with BTPROP as is observed in subsample 2. The loss of general sales tax deductibility (BTGS rises) will lead to a short-run reduction in general sales tax rates, but since $\mu > \mu^*$ long-run revenues from $t^{(GS)}$ rise. Property tax rates and selective sales tax rates may be increased to soften the short-run revenue loss, but since both taxes are on the downward side of their long-run revene curves ($\mu > \mu^*$) revenues will fall in the long-run. The loss of selective sales tax deductilibity (BTSS increases) for sample 2 cities will first lower these rates. If so, and as long-run $t^{(SS)}$ rises, we must conclude that sample 2 cities are on the falling segment of their long-run revenue curve, that is, $\mu > \mu^*$. The reduction in short-run revenues is offset by rate increase for general sales taxes, which (as $\mu > \mu^*$) leads to a long-run decline in $t^{(GS)}$. Property revenues rise slightly in the long-run, implying that property rates were initially reduced as BTSS rose. Finally, for cities in subsample 3, the loss of property tax deductibility again reveals the familiar pattern. As BTPROP rises, property rates are reduced and property tax revenues rise in the long-run. To offset the short-run loss of revenues, tax rates on local income taxes are likely to be increased. As a consequence, long-run revenues rise for income taxes (as $\mu < \mu^*$). With the increase in BTPROP, the rates for selective sales taxes may rise of fall, but if they fall (as they did in subsample 2) and if $\mu < \mu^*$ for these taxes (see below) then revenues $\bar{t}^{(SS)}$ will decline as observed. The loss of income tax deductibility (BTINC increases) leads to a lowering of income tax rates and a short-run and long-run loss of income tax revenues (again as $\mu < \mu^*$). To offset the short-run revenue loss, property tax rates and selective sales rates may be increased; these adjustments will lead to the estimated long-run decline in property tax revenues (as $\mu > \mu^*$) and long-run increase in selective sales revenue (if $\mu < \mu^*$). The loss of selective sales tax deductibility (BTSS up) is likely to lead to a lowering of these rates. If so, and as $t^{(SS)}$ declines, we must conclude that sample 3 cities are on the rising segment of their selective sales revenue curve; that is, $\mu < \mu^*$. Finally, the fall in $t^{(SS)}$ is offset by our increase in income tax revenues as income tax rates are raised.

The reactions of user fees and license revenues to changes in deductibility also show a logical pattern. The bulk of fees and license revenues are charges to business for city services (transport, severage, sanitation, airports). While my measures of deductibility focus on households as taxpayers, the variation in household tax prices from deductibility provisions, tax credits, and state tax rates are likely to be positively correlated with a deductibility benefit for firms as well. If so, an observed loss of deductibility threatens firm exit from the city too. A logical strategy for cities is to lower firm taxes. Fees and license revenues is one of the major "taxes" cities now impose on business. Thus an increase in BTPROP, BTINC, BTGS, and BTSS should have negative effects on fees (F). Generally they do. The only important exception is the positive effect of an increase in BTSS on F for subsample 2; the positive adjustments in F are very small however, for BTSS varies at most by 4% (thus $\bar{F}$ varies by about 5% = 1.22 x 4%). Where swings in tax prices are important, the elasticity of fees is negative.

With most reduced-form analyses one can only speculate as to the underlying structure which produces the observed behaviour. This study is no exception. Yet such speculations are a useful "test" of the validity of the empirical analysis. Do possibly counter-intuitive empirical results have a plausible and consistent structural explanation? If so, our confidence in those estimates increases. I have argued that the empirical results of Tables 1 and 2 can be supported by such a structural explanation. To be sure, more research is needed to reveal the true structure of local fiscal choice, but the model presented here of short-run politics and long-run economics must be regarded as a plausible contender.[26]

IV. Deductibility Reform and City Revenues

Table 3 summarizes the predicted effects of alternative deductibility reform proposals on city revenues, first for our full sample and then for each of the three subsamples. (A data appendix lists the cities in each subsample.) For each reform, I estimate the implied dollar change from the average 1980 values of real (deflated) taxes per capita (T) and real fees per capita (F) for each sample. The initial 1980 levels of taxes and fees are listed in Table 3. I also calculate the percentage change in taxes or fees from their 1980 values.

Deductibility Reforms*

Policy 1: Full removal of federal deductibility of local property taxation only.

Policy 2: Full removal of federal deductibility of local general sales taxation only.

Policy 3: Full removal of federal deductibility of local income taxation only.

Policy 4: Full removal of federal deductibility of all local taxation.

Policy 5: Taxpayers are allowed to deduct local taxes above 1% of household adjusted gross income (AGI).

Policy 6: Taxpayers are allowed to deduct local taxes up to a ceiling of 6.5% of adjusted gross income. Local taxes above this ceiling are not deductible.

Policy 7: Local tax deductibility is replaced by a percentage tax credit. The level of the credit is set so that the cost of credit in federal tax revenues equals $19 billion annually.

Policy 8: Removal of local tax deductibility with cities given a revenue sharing grant equal to local governments share of $19 billion annually.

Table 3

Deductibility Reform and City Revenues

Policy Reform	Full Sample Taxes	Full Sample Fees	Subsample 1 Taxes	Subsample 1 Fees	Subsample 2 Taxes	Subsample 2 Fees	Subsample 3 Taxes	Subsample 3 Fees
0. Pre-Reform (1980) Policy*	$126	$69	$118	$68	$128	$73	$157	$66
1. ($Δ)	$6.36	-$2.42	$16.99	$4.35	-$3.97	-$40.52	$28.12	$7.98
(%Δ)	5.1%	-3.5%	14.4%	6.4%	-3.1%	-55.5%	17.8%	12.1%
2. ($Δ)	$.29	-$.36	(n.a.)	(n.a.)	$13.31	$6.50	(n.a.)	(n.a.)
(%Δ)	.2%	-.5%	(n.a.)	(n.a.)	10.4%	8.9%	(n.a.)	(n.a.)
3. ($Δ)	$.29	-$.36	(n.a.)	(n.a.)	(n.a.)	(n.a.)	-$20.70	-$23.69
(%Δ)	.2%	-.5%	(n.a.)	(n.a.)	(n.a.)	(n.a.)	-13.1%	-35.9%
4. ($Δ)	$6.94	-$3.14	$16.99	$4.35	$9.34	-$34.02	$7.42	-$15.71
(%Δ)	5.5%	-4.5%	14.4%	6.4%	7.3%	-46.6%	4.7%	-23.8%
5. ($Δ)	-$.81	-$.16	-$.73	-$.44	-$.49	-$.78	-$.53	-$.22
(%Δ)	-.6%	-1.1%	-.7%	-1.1%	-.5%	-1.4%	-.4%	-.4%
6. ($Δ)	$11.80	-$2.18	$21.37	$6.99	$12.28	-$29.34	$10.60	-$14.39
(%Δ)	9.4%	-3.2%	18.1%	10.3%	9.6%	-40.2%	6.7%	-21.8%
7. ($Δ)	$1.39	-$.63	$3.40	$.87	$1.87	-$6.80	$1.48	-$3.14
(%Δ)	1.1%	-.9%	2.9%	1.3%	1.5%	-9.3%	.9%	-4.8%
8. ($Δ)	$6.30	-$.90	$16.40	$7.41	$8.70	-$25.11	$6.79	-$11.68
(%Δ)	5.0%	-1.3%	13.9%	10.9%	6.8%	-34.4%	4.3%	-17.7%

Policy options 1 to 4 remove deductibility for local property taxation only (1), general sales taxation only (2), income taxation only (3), and finally for all local taxes simultaneously (4). To estimate effects of reform on revenues, the revenue elasticities in Table 2 corresponding to each tax price and sample were multiplied by the percentage increase in each deductibility component. I assume the deductibility component of tax price will rise to 1.0 when federal deductibility is removed. This is an overestimate of the change in tax price since state deductibility of local taxes and state tax credits for property taxation may not disappear. The estimates in Table 2 are therefore maximal estimates of revenue adjustment. The total effect on city revenues will be the sum of the dollar changes in taxes and fees.

Policy options 5 to 8 all seek to reduce the possible negative effects on state and local revenues of reform while retaining the potential efficiency and tax equity advantages of removing deductibility. To reduce the potential revenue loss to state and local governments, particularly in the short-run, we can either allow partial deductibility (options 5 and 6) or offer offsetting subsidies to taxpayers (option 7) or to local governments (option 8) directly. Each of these modified proposals, however, will reduce the net savings to the Treasury from reform. Treasury and ACIR (1985 chapter 3) estimate that option 4, full removal of deductibility, will save $34 billion of federal tax revenues annually. Policy options 5-8 allocate some of these savings to ease the burden of reform. To insure comparability, the policy parameters of proposals 5 to 8 are set so that each costs approximately $19 billion in lost federal revenues; see ACIR (1985, chapter 3).

Option 5 only allows deductibility of local taxes which exceed a floor of 1% of taxpayers' adjusted gross income. I have assumed the typical itemizer is in the 28% marginal tax bracket and has an adjusted gross income of $40,000. Thus under option 5 the taxpayer can deduct all state and local taxes over $400. Since most taxpayers pay in excess of $400/year in state-local taxes, the taxpayers can still itemize marginal local tax payments. The price effect of deductibility remains. However, itemizers loses .28 x $400 in lost deductions or approximately $120/year. This income loss can reduce local taxes and fees (see Table 1; CINC coefficient). If we assume the resulting loss in income per capita is about $30 per year ($120/year ÷ 4 members per family), then revenues will decline as shown in Table 3, row 5.[27]

Policy Option 6 is a variation of policy 5; taxpayers are still allowed to deduct but now only to a ceiling of 6.5% of adjusted gross income. Beyond this ceiling local taxes are not deductible. For the typical itemizes in the 28% marginal tax bracket and earning $40,000, state and local taxes up to $2600 per family will be deductible (= .065 x $40,000). Only taxpayers in very high tax states and cities will be affected by the 6.5% ceiling. Those affected will lose deductibility for taxes above $2600, but they retain a fixed gain of $728 (=.28 x $2600) from the deduction up to the ceiling. The effects of this reform on city revenues is difficult to predict precisely. Cities whoes itemizers pay less than their ceiling in state and local taxes are unaffected by the reform. Cities whose typical itemizers pay more than their ceilings may adjust revenues. This adjustment is estimated as a combination of the revenue effects of option 4 offset by the revenue increases which result from increased resident income (from income with option 4) because of the fixed gain from the partial deduction (= $728/family or $182 per capita). See Table 3, row 6.

Policy option 7 partially offsets the loss of deductibility by a tax credit for local taxation defined as γ in our earlier definition of the tax price. The size of the credit is set so as to cost the Treasury approximately $19 billion: $\gamma = .07$ under this reform.[28] Combining lost deductibility with a 7% credit will increase the deductibility components of sales, income, and property tax prices from their initial values ($\cong .86$) to .93. The resulting revenue adjustments are reported in Table 3, row 7.

Option 8 gives the city the direct revenue assistance to offset any negative effects of deductibility reform. In this reform all state-local taxes lose federal deductibility but state and local governments receive $19 billion in revenue-sharing aid as compensation. I estimate that approximately $33 per resident will be returned to local governments.[29] Not all of the $33 transfer goes to city services, however; some (a small amount) may be allocated to tax relief (see Table 1; RSAID coefficient). Table 3, row 8 estimates the equilibrium changes in tax and fees under option 8. To estimate the <u>total</u> revenue effects of this reform, the $33 transfer must be added to the estimated changes in fees and taxes.

Other reforms are of course possible and have been suggested. Table 3's results bound the likely effects of the other major reform proposals. The Kemp-Kasten proposal which would retain deductibility for property taxation (at 25% rate only however) but disallow deductibility of sales and income taxes will have effects approximately equal to the sum of those for policies 2 (sales) and 3 (income) in Table 3. The Bradley-Gephardt tax reform plan drops sales tax deductibility (option 2) and lowers the rate (to 14%) at which property and income taxes can be deducted. The effects of this reform are bounded between those from option 2 (only sales) and option 4 (full removal).

What is the effect of deductibility reform on city revenues? Four conclusions emerge from the policy simulations in Table 3. First, total taxes change very little in the long-run, falling by at most 13% (reform 3, subsample 3) and generally rising slightly. Second, fees and license revenue (predominantly a tax on firms) generally fall, often significantly (policies 4,6, and 8 for subsamples 2 and 3).[30] Third, the net long-run effect on total revenues ($\Delta T + \Delta F$) of full deductibility reform (options 4 to 8) is usually positive, but when negative, the revenue loss is at most 12% of pre-reform revenues (= -\$24.68/\$201 for option 4, subsample 2). Fourth, the offset policies 5 to 8 reduce the revenue effects significantly. In fact, the revenue-sharing offset (policy 8) substantially increases city revenues once we add \$33 per capita of revenue-sharing aid to the city budget.

While the results in Table 3 should be encouraging to the proponents of state and local deductibility reform, we must remember that these estimates apply only to large cities and they measure only the long-run effects of dropping deductibility. States and suburban governments may behave quite differently; see Kenyon (1985) and Gramlich (1985). And there is no doubt that in the short-run cities will feel the pressure to lower taxes and public services.

V. Conclusion: Should We Drop Deductibility?

Removing the deductibility of state and local taxes has emerged as the cornerstone of the recent efforts to reform the current federal tax code. While numerous other deductions or "loopholes" are closed by the Treasury's tax package, it is state and local deductibility reform which provides the revenues needed to lower overall rates and to raise the level of personal exemptions. While fewer loopholes or a simplier tax code is always a worthwhile objective, one suspects it is tax relief which makes the Treasury's proposal so politically appealing. Yet it is important to consider the removal of state and local tax deductibility as a policy in its own right, not simply as a source of new federal revenues. The empirial analysis presented here may help us to decide the issue.

First, the major efficiency gains from deductibility reform, at least for our central cities, will come not from lower local public spending but from a more efficient structure of local taxation. Deductibility reform is likely to lower tax rates on property, retail sales, and wage income in the center cities. Each of these taxes is a source of significant resource misallocation, discouraging the efficient location of housing and productive capital.[31] Further, as our central cities appear to be on the downward side of their rate-revenue schedules for property and sales taxation, lower rates may actually mean more revenues and thus public services. Deductibility reform "shocks" the central city away from a politically expedient, but economically inefficient, structure of local finance.

Second, there are gains in public sector equity, but a full federal-state-local budgetary incidence will be required to weigh the pluses and minuses across income classes. The removal of deductibility itself and the return of those revenues as lower tax rates and higher personal exemptions clearly helps lower income families. Only rich families are itemizers, while all households gain from the reduction in federal rates. The likely incidence effects within the local public sector are more difficult to judge. Local taxes may become more regressive to the extent cities can legally tilt their rate structures, and city services (as argued in III-B above) are likely to become more pro-rich. Yet city services may also increase for all households in the long-run as city revenues rise. It is not clear the center city poor will lose services in the long-run. Public services in the suburbs are likely to fall, however. If suburban governments have avoided the politically inefficient "revenue trap" and are still on the rising portion of the tax rate-revenue schedule, then the loss of deductibility will lead to lower service demands by as much as ten percent (Gramlich, 1985). Thus deductibility reform may narrow public service inequities between city and suburban residents. On balance lower income, non-itemizers gain federal tax relief and possibly lose local public services. Upper income itemizers within the city pay higher federal taxes but gain local public services. Upper income itemizers within the suburbs will pay higher federal taxes and lose local public services. Whether these re-allocations constitute a net gain in social equity clearly depends on one's sense of fairness and relative weighting of public vs. private goods.

Footnotes

*Professor, University of Pennsylvania and Research Associate, NBER. This work was completed while the author was a Visiting Professor of Economics at the University of California, Berkeley (fall, 1984) and at Stanford University (Spring, 1985). The hospitality of both institutions, NBER-West, and the Hoover Institution is greatly appreciated. Portions of this work were funded by a grant from the ACIR. The analysis is part of a larger project on urban fiscal policy supported by the Federal Reserve Bank of Philadelphia. None of the above organizations bear responsibility for the analysis or conclusions presented here. The helpful comments of Dick Netzer, Helen Ladd, and Larry Huckins are gratefully acknowledged as is the very able research assistance of Harry Paarsch.

[1]Other possible sources of funding current public services are the expansion of short-term debt or the depletion of cash and security holdings. Efforts to include these sources and estimate a current accounts deficit equation were not successful. The problem appears to be too little variation in the dependent variable over the sample period for the majority of the sample cities.

[2]Previous work on the effects of federal tax laws on local and state finance has been limited to one year cross-section analyses; see Inman (1979), Hettich and Winer (1984), and Kenyon (1985). Such cross-section studies cannot adequately control for unmeasured political, economic, or institutional differences across observations, differences which may be highly correlated with the extent of

deductibility or taxpayer itemization (often used as a proxy for deductibility). Therefore the estimated influence of deductibility may be badly biased in such studies. Estimation using pooled cross-section, times-series data is the only solution to these problems.

[3] See Mueller (1979 chapter 3).

[4] But see Inman (1982).

[5] All fiscal data for this study are from the annual U.S. Census publication, City Government Finances, for the fiscal years 1960 to 1979-80. The revenue categories analyzed here correspond to the Census' definition of total taxes (T), tax revenue from property taxation ($t^{(1)}$), general sales taxation ($t^{(2)}$), selective sales taxation ($t^{(3)}$), income taxation ($t^{(4)}$), all "other" taxes ($t^{(5)}$), and fees and licenses (F = "motor vehicle licenses" plus "miscellaneous licenses" plus "charges and miscellaneous general revenue" minus "charges for higher education"). Total revenue (R) corresponds to the category "general revenue from own sources" minus "charges for higher education." Utility revenue or employee-retirement revenues are excluded from analysis.

[6] In addition to testing for a fixed (or intercept) effect of tax availability on revenue decisions, I also divide the forty-one city sample into three, mutually exclusive subsamples according to tax instrument availablity; see Data Appendix for details. This more general treatment allows both the intercept (α_{is}) and slope

coefficients (β_{is}'s) to differ according to a city's access to different taxes.

[7]Most states will impose rate limitations on local sales taxation and local income taxation as well, but information on the exact limits were not available for all years of our sample. What data were available showed little variation (rates usually between 1% and 2%) across the cities in our sample. Thus the tax-access dummy variables DI and DGS will, in effect, be rate limit dummy variables where DI = 0 and DGS = 0 mean a rate limit equal to 0.

It is important to emphasize that even when cities face effective rate limits, tax revenues from the constrained tax are still endogenous as city's often retain control over tax base and always retain control over enforcement and collection. Tax rates are only one, though probably the most important, of the control variables to limit local revenues.

Data for RLIM and LEVYLIM are obtained from the Advisory Commission on Intergovernmental Relations, Significant Features of Fiscal Federalism, various years, and from Advisory Commission on Intergovernmental Relations, State Limitation on Local Taxes and Expenditures, February , 1977.

[8]CINC is defined as disposable income per resident (from Sales Management, Effective Buying, 1960 - 1980) adjusted for the resident's share of local taxes. CAID is defined as city aid from federal and state governments other then welfare aid or general revenue-sharing; data from Bureau of the Census, City Government Finances, 1960 through 1979-80. RSAID is general revenue-sharing aid as reported in Bureau

of the Census, City Government Finances, 1960 to 1979-80. PI is a city cost of living index based upon the metropolitan annual costs of goods and services for a family of four, net of housing expenses; data are from U.S. Department of Labor, Bureau of Labor Statistics, Handbook of Labor Statistics, various years from 1967 to 1980. PI for years prior to 1967 use the city's 1967 metropolitan index deflated by the national CPI for the years 1960 to 1966.

[9] This variable was first presented in Inman (1972, 1979); see also Zimmerman (1983). Denzav and Mackay (forthcoming) provide a general treatment of this variable.

[10] Itemization by income class is available annually for a national sample of taxpayers from Statistics of Income, Individual Income Tax Return, published by the IRS.

[11] Data on the marginal tax rate for federal income taxes are from Table no. 437, Statistical Abstract of the United States, 1983, the source of which is unpublished data from the U.S. Treasury. Data on the marginal tax rates for state income taxes are available from the Advisory Commission on Intergovernmental Relations, Significant Features of Fiscal Federalism, various years, and from state tax codes for years not available from Significant Features.

[12] Data necessary to define the relevant rate of property tax credit are available from the Advisory Commission on Intergovernmental Relations, Property Tax Circuit-Breakers: Current Status and Policy

Issues, February, 1975, and from the ACIR publication, Significant Features of Fiscal Federalism, various years. The credit rate (γ) for eligible taxpayers is defined as γ = (average benefit paid per claimant/average property tax paid per claimant) for each state. As most programs are limited by income, only those taxpayers in each city who are income eligible are allowed a value of $\gamma > 0$. If an age restriction also applies (often only taxpayers over 62 are eligible), γ was multiplied by the percent of households in the city over the age limit. A similar adjustment was made if the program was limited to homeowners; γ was multiplied by the percent of households who are homeowners. Unfortunately data on age and home ownership by income class are not available by city; thus a more precise estimate of the average rate of credit could not be calculated.

[13] Data on the percent of city property assessed as commerical-industrial property (PCI) are available from the publication Property Taxation, Census of Government, for the years 1957, 1962, 1967, 1972, 1977, and 1982. Simple linear trends were calculated for the intervening sample years.

The percent of general sales taxation paid by non-residents (PNRGS) was estimated as the ratio = (total retail sales in the city - resident purchases)/(total retail sales in the city), where resident purchases was approximated by the share of residents' disposable income spent on taxable items. Taxable items under general sales taxation generally include all expenditures except services, transportation, health care, and housing; the taxable share was estimated to be .6 of disposable income (see Houthakker and Taylor (1970) or Rock (Table 1, 1984). Data for retail sales in the city and for disposable income are available from Sale Management, Survey of Buying Power, for the years 1960-1980.

The percent of selective sales taxation paid by non-residents (PNRSS) is in principle estimated by the ratio = (total selective sales in the city - resident purchases of selective sales)/(total selective sales in the city), where "selective sales" is defined to include public utility sales in cities which tax public utility sales and entertainment, hotel, and recreation activities in cities which tax these activities. Data on entertainment, hotel and recreation expenditures in cities are available from Sales Management, Survey of Buying Power; 1960-1980. The residents' expenditures on entertainment, hotel and recreation within the city was estimated as .03 of residents' disposable income; this share is one-half of the total share of disposable income generally allocated to such activities; see Houthakker and Taylor (1970). Data on public utility sales are not available by city. I therefore assumed all of public utility taxes — the bulk of which are paid by firms — fall on non-residents. With this adjustment PNRSS is now approximated by the ratio = (public utility taxes + $\emptyset$(total selective sales taxes - public utility taxes)/(selective sales taxes), where $\emptyset$ equals the non-residents share of entertainment, hotel, and recreation expenditures within the city.

The percent of city wages earned by non-residents (PNRY) is approximated by the ratio (suburban income per family x number of commutors)/(total wage income earned within the city). Sales Management, Survey of Buying Power, 1960-1980, provides estimates of suburban income per family. The Bureau of the Census publication

Journey to Work, 1960, 1970, 1980 provides data to estimate the fraction of the city work force who commute; data for intervening years are calculated by a linear trend. Total wage income earned in the city is the sum of suburban commuter income plus city resident income earned in the city. City resident income is estimated as city income per capita times the number of city jobs held by city residents (i.e., total city jobs less jobs held by commuters). Data on city resident income are from Sales Management, Survey of Buying Power, 1960-1980. Data on total jobs within the city are from U.S. Census, Journey to Work, 1960, 1970, 1980 and equals the total number of people who work within the city; intervening years are calculated by a linear trend. Adjustments to PNRY are made for cities which tax commuters and residents at different rates.

[14] The percent of fees and licenses (exclusive of fees for higher education) paid by non-residents (PNRF) is approximated by the share of fees and licenses from parking fees, highway tolls, airport fees, water transport fees, and fees from miscellaneous commercial activities.

[15] For a more complete discussion see Inman (1982,1983).

[16] Gordon and Slemrod (1985) explore this form of tax shifting in more detail.

[17] The variable, ratio of city to suburban income (RCSI), has been used with some success in other work (Inman, 1982) to measure the potential mobility of city residents to suburbs. Cities whose mean household

income is low relative to mean suburban income have poor residents surrounded by relatively rich suburbs (small values of RCSI) while cities whose mean income is high relative to mean suburban inocme have relatively rich residents surrounded by poor suburbs (high values of RCSI). In both instances, acceptable suburban housing will be unavailable to city residents who wish to leave. Exit will therefore be limited. Regions where mean city and suburban incomes are approximately equal will have more extensive suburban housing options for city residents, and the threat of exit will be more intensely felt by city officials. The ideal specification is therefore RCSI and $RCSI^2$. This specification was tried, and in all cases a minimum or maximum was achieved well beyond the limits of our sample. To conserve degrees of freedom the log specification was therefore adopted.

[18]For a discussion of the New York fiscal crisis and similar crises in Cleveland and Philadelphia, see Inman (1983). Prompted by these events, the period 1975 to 1980 was a time of increased public scrutiny of central city budgets and tax structures.

[19]The omitted tax category is defined as "other taxes" by the U.S. Bureau of the Census publication, <u>City Government Finances</u>.

[20]The differences are generally statistically significant. The initially hypothesized specification is that $T = \alpha + \beta_0\tau + \beta_x X + \varepsilon$, where τ = (1-BTPROP)(1-PCI). If included separately the estimated coefficient of (1-BTPROP), denoted $\hat{\beta}_1$, should equal β_o (1-PCI) while

the estimated coefficient of (1-PCI), denoted $\hat{\beta}_2$, should equal β_0(1-BTPROP). One test of the hypothesis that the two variables are correctly specified via τ alone is a test that $\hat{\beta}_1/(1\text{-PCI}) = \beta_0 = \hat{\beta}_2/(1\text{-BTPROP})$, or alternatively the $\hat{\theta} = \hat{\beta}_1/(1\text{-PCI})) - \hat{\beta}_2/(1\text{-BTPROP}) = 0$. A t test of the null hypothesis that $\hat{\theta} = 0$ in the total tax equation against the alternative hypothesis that $\hat{\theta} \neq 0$ rejects the null hypothesis at a .99 confidence interval; $t = \hat{\theta}/\sigma_{\theta} = 132.6/39.33 = 3.37$. A similar test for the coefficients on BTINC/SAL and (1-PNRINC/SAL) from Table 1 does not reject the equality of those coefficients however; $t = \hat{\theta}/\sigma_{\theta} = .43$. Yet over all subsample revenue regressions we can generally reject equality of the components of τ^{GS}, τ^{SS}, and τ^{INC}. As I shall argue below there are compelling reasons for different effects of these variables on city revenues; see section III-B.

[21] The arguments for the separate effects of deductibility and non-resident taxation on city revenues raises the possiblity that PCI, PNRGS, PNRSS, and PNRY are not exogenous but in fact determined in part by revenues. To test for the possibility of serious simultaneous equation bias in our estimates of the effects of deductibility on revenues, I re-estimated all models excluding PCI, PNRGS, PNRSS, PNRY, and (for similar reasons) ARBINT. The coefficients on the deductibility variables were essentially unchanged.

[22] Tax revenues $t^{(r)}$ are maximized at the rate where $\partial t^{(r)}/\partial\mu = (1 + \varepsilon(\mu))B(\mu) = 0$, where $t^{(r)} = \mu B(\mu)$ and $\varepsilon(\mu)$ is the elasticity of tax base, $B(\mu)$, with respect to the tax rate μ. As the tax base becomes more responsive to changes in tax rate, the elasticity becomes more

negative and the value of $\partial t^{(r)}/\partial\mu$ declines. For constant elasticities at least, this implies that $\partial t^{(r)}/\partial\mu$ will reach 0 at lower values of μ as tax bases become more elastic.

[23] See Fair (1978). Given the high mobility of voters into and out of local communities, the "what-have-you-done-for-me-lately" mentality may be rational for local voters as well. See Inman (1982) on pension funding.

[24] See Grieson (1974) on property taxation and Grieson et. al. (1977) for sales taxation.

[25] Labor supply elasticities are generally low, but more importantly the elasticity of job location with respect to tax rates is also modest. Gruenstein (1980) estimates that while Philadelphia does lose jobs with tax increases, total wage tax revenues are still increasing.

[26] The implicit structure of the model presented here will define local tax rates ($\mu^{(r)}$) and revenues ($t^{(r)}$) as the outcome of an economic process which defines a long-run revenue schedule — $t^{(r)} = f(\mu^{(r)};Y)$, where Y are exogenous economic variables — and a short-run political reaction function which selects ($\mu^{(r)}$, $t^{(r)}$) combinations subject to a set of political variables (Z) and current period tax bases which are themselves a function of Y and past revenue policies — $t^{(r)} = g(\mu^{(r)};$ $Z, Y;\mu_{-1}^{(r)}, t_{-1}^{(r)})$. Equilibrium allocations occur when the political reaction function intersects the long-run revenue curve; see Figure 2. The reduced form of this model becomes:

$$t^{(r)} = t^{(r)}(Y,Z;,Y_{-1},Z_{-1})$$

Which is the specification outlined in equations (1) – (5) above. Economic constraints define the Y variables while political constraints and legal constraints are included in Z. Deductibility reform influences $t^{(r)}$ directly through Y and indirectly through the political reaction function via Y_{-1}.

[27]The subsample results are based upon estimated effects of CINC on T and F from subsample revenue regressions not reported here. The effects are similar to those given in Table 1 for the full sample. Subsample regressions are available from the author upon request.

[28]The credit is defined so as to return \$19 billion to the state and local sector as a subsidy to state and local taxation. I estimate state and local taxes to be about \$260 billion in 1985; thus γ = \$19b/\$260b $\simeq$ .07.

[29]The general revenue sharing program will spend \$19 billion per year or \$85 per capita. Approximately 39 percent of total state and local taxes are raised by local governments. If federal aid is divided between the state and local sectors according to resident taxes paid, then 39 percent of total aid or \$33 per capita (= .39 x \$85) will be given to local governments.

[30]It should be noted that the Treasury's most recent proposal continues to permit firms to deduct state and local taxes as a

business expense. If the argument in section III is correct that fees are reduced to soften the blow to firms of lost deductibility, then the induced reduction in fees under the Treasury plan should be less than the losses reported in Table 3. There may still be pressure to lower fees under the Treasury proposal to the extent that lost deductibility for households is shifted to firms. For example, firms may bear the burden of differential local wage and sales taxation. In any case, the fee reductions in Table 3 are likely to be an on outer estimate of the revenue loss with deductibility reform.

[31]See, for example, Grieson (1974) and Haurin (1981).

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Data Appendix
Means (standard deviations)

Variable Name	Full Sample	Subsample 1	Subsample 2	Subsample 3
Dependent				
T	$104.14 (65.72)	$100.99 (71.12)	$110.28 (72.78)	$130.14 (75.45)
$t^{(PROP)}$	$69.61 (56.51)	$91.25 (70.31)	$62.97 (49.37)	$60.07 (50.78)
$t^{(INC/SAL)}$	$32.21 (30.98)	n.a.	n.a.	n.a.
$t^{(GS)}$	n.a.	n.a.	$25.29 (14.94)	n.a.
$t^{(SS)}$	n.a.	$8.49 (8.04)	$12.49 (10.96)	$10.35 (11.87)
$t^{(INC)}$	n.a.	n.a.	n.a.	$49.01 (24.62)
F	$50.98 (27.84)	$42.36 (21.58)	$58.27 (29.03)	$61.43 (28.71)
Legal				
DED	.202 (.402)	.387 (.488)	.133 (.340)	.138 (.346)
DWL	.145 (.352)	.102 (.304)	.224 (.417)	.138 (.346)
DI	.242 (.421)	n.a.	n.a.	n.a.
DSS	.314 (.465)	n.a.	n.a.	n.a.
DGS	.361 (.481)	n.a.	n.a.	n.a.
RLIM	.061 (.052)	.051 (.059)	.067 (.049)	.068 (.053)
LEVYLIM	.199 (.401)	.216 (.412)	.255 (.437)	.094 (.293)

Variable Name	Full Sample	Subsample 1	Subsample 2	Subsample 3
<u>Economic</u>				
CINC	\$3101 (577)	\$2891 (542)	\$3355 (586)	\$3123 (451)
CAID	\$61.12 (65.27)	\$62.86 (69.52)	\$57.06 (54.84)	\$83.93 (82.87)
RSAID	\$4.50 (6.44)	\$3.15 (5.57)	\$5.51 (6.51)	\$7.45 (7.89)
PI	1.289 (.430)	1.188 (.401)	1.397 (4.37)	1.402 (.440)
$\tau^{(PROP)}$	.554 (.089)	.523 (.096)	.578 (.091)	.536 (.067)
BTPROP	.868 (.043)	.866 (.051)	.867 (.029)	.875 (.046)
(1-PCI)	.638 (.098)	.605 (.107)	.666 (.101)	.613 (.071)
$\tau^{INC/SAL}$	.560 (.422)	n.a.	n.a.	n.a.
BTINC/SAL	.865 (.213)	n.a.	n.a.	n.a.
(1-PNRINC/SAL)	.628 (4.81)	n.a.	n.a.	n.a.
τ^{SS}	n.a.	.314 (.367)	.156 (2.05)	.676 (.444)
BTSS	n.a.	.946 (.057)	.975 (.045)	.979 (.037)
(1-PNRSS)	n.a.	.327 (.379)	.161 (2.05)	.689 (.451)
τ^{GS}	n.a.	n.a.	.682 (.553)	n.a.

Variable Name	Full Sample	Subsample 1	Subsample 2	Subsample 3
BTGS	n.a.	n.a.	.871 (.028)	n.a.
(1-PNRGS)	n.a.	n.a.	.795 (.642)	n.a.
τ^{INC}	n.a.	n.a.	n.a.	.555 (.175)
BTINC	n.a.	n.a.	n.a.	.887 (.033)
(1-PNRY)	n.a.	n.a.	n.a.	.628 (.202)
(1-PNRF)	.822 (.164)	.857 (.094)	.759 (.218)	.865 (.095)
ARBINT	.028 (.016)	.024 (.014)	.032 (.016)	.031 (.019)
<u>Political</u>				
PCRICH	23.16 (4.95)	22.48 (4.42)	24.89 (5.65)	19.77 (2.76)
PCPOOR	11.94 (3.99)	11.99 (4.77)	11.97 (3.79)	13.27 (2.60)
LRCSI	.077 (.381)	.002 (.343)	.223 (.368)	.033 (.398)
YEAR	1970 (6.06)	1968 (6.06)	1971 (5.68)	1972 (5.57)
CRISIS	.286 (.452)	.205 (.401)	.374 (.485)	.386 (.488)

n.a. = Not applicable to sample.

Composition of Subsamples+

Subsample 1: Use of property and selective sales taxes only.
Atlanta,* Baltimore, Birmingham, Boston,* Buffalo,* Cleveland, Dallas, Ft. Worth, Houston, Indianapolis,* Kansas City, Memphis,* Milwaukee,* Minneapolis,* Newark,* Norfolk, Oklahoma City, Omaha, Portland,* Rochester, San Antonio, Seattle, St. Paul.

Subsample 2: Use of property, general sales tax, or selective sales taxes only.
Birmingham, Buffalo, Chicago,* Dallas,* Denver,* Ft. Worth,* Houston,* Kansas City, Long Beach,* Los Angeles,* New Orleans,* New York, Norfolk,* Oakland,* Oklahoma City,* Omaha,* Phoenix,* Rochester,* San Diego,* San Francisco,* San Antonio,* Seattle,* St. Louis.

Subsample 3: Use of property, selective sales, and income taxes. Some cities in this sample may also have access to a general sales tax.
Baltimore,* Birmingham,* Cincinnati,* Cleveland,* Columbus,* Detroit,* Kansas City,* Louisville,* New York,* Philadelphia,* Pittsburgh,* St. Louis,* Toledo.*

+ Cities may appear in more than one subsample if new taxes are made available over time. An * locates the tax subsample to which the city belonged in 1980.