Abstract - We discuss budgetary institutions and the evolution of tax systems in the state and local sector, drawing on evidence from New York City. An increasing reliance on personal income taxes and a corresponding de-emphasis on property taxes have made the city’s tax revenues significantly less stable and more sensitive to fluctuations in the city’s economy. Nonetheless, adjusting the personal income tax rate to smooth revenues over the business cycle may be an effective way of transferring cyclical shocks from an actor who faces borrowing constraints (the city or state) to actors who do not face such constraints (upper income taxpayers).

INTRODUCTION

In fiscal year 1999, state and local governments in the U.S. ran a current surplus of 32 billion dollars. By the first quarter of 2002 (2002 Q1), the sector had fallen into a deficit of $55 billion (NIPA basis, annual rate). These problems were not quickly resolved. As of this writing, since fiscal year 2001, states have cut expenditures by over $200 billion, while tax increases added $15 billion to state coffers (Calmes, 2003). Nonetheless, budget difficulties remain. California entered fiscal year 2004 with an unresolved budget gap in excess of $30 billion; in the winter and spring of 2003 New York City took actions to close, at least on paper, a $6.4 billion gap in its FY 2004 budget. While these governments are at the extreme of the distribution of fiscal problems, significant stress continues to pervade the sector (Calmes, 2003).

The radical deterioration in the fiscal position of state and local governments was widely attributed to the effects of the recession that began in March 2001, and ended in November of that year. Over the period 2001Q1 to 2001Q4, real Gross Domestic Product (GDP) actually rose slightly, although it fell during both the second and third quarters. A major question facing analysts of the state and local sector is how the relatively mild and short-lived 2001 recession led to such significant budget problems. Recent work (Knight, Kusko and Rubin, 2003) indicates that only a small proportion of the state fiscal stress was directly attributable to the economic downturn, while others (Sjoquist and Wallace, 2003) point to the decline in asset values as part of the answer.
In this paper, we argue that institutional constraints have combined with features of the major taxes used by state and local governments to make the sector more vulnerable to large revenue shortfalls during economic downturns. We develop this insight with a case study of New York City. New York’s budgets are the size of a typical state’s, and its revenue system has more in common with that of state governments than it does with other municipalities. Yet its primary responsibilities are municipal services, its jurisdiction is geographically limited, and its fiscal decision making is heavily constrained by its parent government, New York State. In addition, we believe that New York City offers a look at the culmination of current trends in the taxation decisions of state and local governments. The New York example is, thus, instructive for students of the state and local sector more generally.

We begin with a description of the New York experience of fiscal crises and the evolution of its tax system over the last thirty years. We argue that the city’s increasing reliance on personal income taxes has made the city’s tax revenues more sensitive to fluctuations in the city’s economy and more susceptible to large changes in direction. We then discuss the interactions among institutions, revenue volatility and economic activity. Where institutions constrain the borrowing and lending of government, adjusting the personal income tax top rate to smooth revenues over the business cycle may transfer the impact of cyclical shocks from actors who face borrowing constraints (the government and lower income taxpayers) to actors who do not (upper income taxpayers). To the extent that these unconstrained actors smooth their consumption through borrowing, this method of smoothing revenues over the business cycle may, in fact, cushion the impact of cyclical shocks rather than exacerbate them.

NEW YORK CITY AND THE MANAGEMENT OF FISCAL STRESS

As part of the response to New York City’s severe fiscal crisis in the mid–1970s, the New York State Financial Emergency Act (FEA), a primary set of regulations governing fiscal policymaking in New York, was passed in 1975. The city’s fiscal problems had developed over the late 1960s and early 1970s, as spending routinely exceeded revenues, leading to increasing levels of short–term debt. By fiscal year 1975, the city’s outstanding short–term debt obligations exceeded $2,000 per capita in $1994 (Haughwout, 1997). The city’s creditors became increasingly uncomfortable with this pattern and refused to make further loans in June of 1975. This kicked off a fiscal crisis that led to numerous institutional changes and reforms aimed at making the city’s budget practices more transparent and requiring officials to submit budgets expected to be in balance (Fuchs, 1992).

While there can be no doubt that New York’s fiscal situation has improved dramatically since the FEA was first passed, the city’s finances remain variable, as events of recent fiscal years have demonstrated. In this section, we examine one source of instability in the city’s budget: its tax revenues. We argue that by shifting emphasis from a property tax–dominated system to one more dependent on income taxes, the city has become tied to a less stable and more economically sensitive revenue base.

Trends in New York City Spending and Tax Collections

New York City receives revenue from four major taxes: Property, Personal Income, General Sales and General Corporation. Figure 1 depicts the path of real ($1993) revenues from these sources and total general expenditures in fiscal years.
1970–2002. Also shown on the graph is the New York City Index of Current Economic Indicators (NYC CEI), a measure of the state of the local economy.\(^1\) The figure shows the magnitude of New York City’s general expenditure (the city spent about $40 billion in fiscal year 2002) and the importance of these taxes in the city’s finances. Interestingly, general expenditures appear to be unrelated to the short–run changes in the economy as measured by the CEI, even after 1975.\(^2\)

Meanwhile, revenues from the four major taxes have grown about 50 percent since 1970, highlighting the city’s increased reliance on these taxes relative to other sources of general revenue. The four–tax share rose from about 40 percent of total general expenditures in 1970 to just under 50 percent in 1999. Smaller taxes, fees, and grants–in–aid finance most of the remainder. The decline in tax revenues that accompanied the city’s 2001–2002 economic downturn reduced the four–tax share of revenues to just under 45 percent by 2002.

The composition of the four–tax total has changed markedly over the past three decades. In 1970, the property tax accounted for 68 percent of the revenues generated by the four major taxes, while the personal income tax accounted for 8 percent. In 1999, the property tax accounted for 42 percent of four–tax revenues and the personal income tax for 30 percent. The share of four–tax revenues generated by sales and general corporation taxes has changed little, rising from 25 percent in 1970 to 28 percent in 1999. The share of four–tax revenues generated by

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\(^{1}\) The NYC CEI is a measure of current economic activity estimated using the methodology of Stock and Watson. It is described fully in Orr, Rich and Rosen (1999).

\(^{2}\) Regression of the percentage change in general expenditure on the percentage change in the CEI yields a coefficient of –0.25 and a standard error of 0.21. This result is heavily influenced by the pre–fiscal crisis period, however. A similar regression for 1979–2002 produces a coefficient of 0.04 and standard error of 0.25.
the personal income tax fell to 25 percent during the recent downturn, but the clear trend over the last thirty years has been toward income taxation and away from property taxation. This trend towards income taxation has been a common feature of the revenue systems of state and local governments nationwide (Dye and McGuire, 1991; Sobel and Holcombe, 1996; see also Sweeting (2003) for a discussion of New York City).

The Recent Downturn

When the downturn in the New York City CEI began in February 2001, revenues from personal income taxation fell quickly and sharply, while property tax revenues continued to grow (see Figure 2). Revenues from the sales and general corporation taxes also declined. The net effect on four–tax revenues was negative.

City expenditures are difficult to cut in the short run. A large share of city expenses is determined by either contractual obligations, which are unaffected by the state of the economy, or entitlements, like local Medicaid and welfare costs. Figure 2 shows that city expenditures in most budget categories rose throughout the recent economic downturn.

The FEA limits New York City’s ability to cushion its budget from the effects of the business cycle through saving or borrowing. It prohibits the city from running budget deficits and limits its ability to hold cash reserves that arise from unexpectedly strong tax receipts. Thus, the city cannot hold a “rainy day fund.” At best—as in the 1990s—the city may use surplus funds to pre–pay debt service and subsidies to non–city agencies such as the NYC Transit Authority.3 New York City thus faces a relatively strict operating budget constraint, with few exceptions.

When the economy suddenly turns down, as it did in 2001–2002, New York City faces a combination of falling revenues, fixed or rising expenditures, limited cash reserves, and a limited ability to borrow. This combination forces the city to

Figure 2. Breakdown of Total General Expenditures and Four–Tax Revenues, 1999–2003

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Forum on the State and Local Fiscal Crises

resort to asset sales and tax rate increases to close budget gaps. We argue in the next section that the shift from property to income taxation has made the potential revenue shortfalls associated with an economic downturn more severe.

Characteristics of New York City's Major Tax Bases

Three properties of tax bases that are useful in understanding the evolution of New York City’s tax revenues are their persistence, volatility and economic sensitivity. The more strongly positive the relationship between this year’s and last year’s growth is, the more persistent a base is said to be. If the officials who choose tax rates simply assume that next year’s base growth will look like this year’s, they will often be wrong when the base is not persistent, potentially leading to budget gaps.

Figure 3 shows the paths of the city’s income and property tax bases since 1970. The property tax base appears to be more persistent than the income tax base. There are relatively long periods where the property tax base is either rising or falling. One year of above–trend growth tends to be followed by another. The income tax base, on the other hand, changes direction frequently. Above–trend growth in one year tends to be followed by below–trend growth the next. These observations are confirmed by statistical tests summarized in the first row of Table 1. Like the property tax base, the sales tax base is fairly persistent. There is no significant relationship between this year’s and last year’s deviations from trend growth in the general corporate tax base.

Figure 3. Bases of Four Major New York City Taxes

Our base measures follow Haughwout, Inman, Craig and Luce (2003). The property tax base is market value of taxable property, as estimated by the New York State Office of Real Property Services. For other taxes, we estimate the base from average rate and revenue information.
A second important characteristic of a tax base is its volatility. Volatility is the magnitude of unexpected changes in a series. A volatile series exhibits large unanticipated deviations from trend, while a stable series exhibits only small deviations. Volatile tax bases are uncertain—knowing this year’s performance of the tax base provides little information as to what it will do next year. The resulting uncertainty in what the tax base will do leads to uncertain revenues and the risk that budget gaps, both surpluses and deficits, will be large.

All of the tax bases are quite volatile in the sense that unexpected changes are substantial in comparison to the same measure for the CEI. The entries in the second row of Table 1 represent the average magnitude (in percentage terms) of the growth in each tax base that is unexplained after accounting for last year’s growth. Higher numbers indicate more volatility. The bases of the city’s property and sales taxes are less volatile than those of the income and general corporate taxes.

Finally and perhaps most importantly, economic sensitivity (sometimes called “elasticity”) is the strength of the short-run relationship between a tax base and the current state of the economy. Sensitive bases respond strongly to contemporaneous changes in the economy, while insensitive bases do not. Revenue sources whose bases tend to decline sharply when the economy slows will make the city susceptible to budgetary shortfalls during economic downturns.

Refer again to Figure 3, which plots the bases of the income and property taxes and the CEI. While the property tax base appears to be impervious to contemporaneous changes in the CEI, turning points in the CEI tend to be followed by changes in the direction of the property base two to five years later. The personal income tax base, on the other hand, tends to change direction at the same time as the CEI. This contrast is confirmed by the third row of Table 1, which shows that the personal income tax base responds quickly and strongly to changes in the CEI. The sales and general corporate tax bases also respond quickly, but less elastically, while there is no discernible short-run relationship between growth in the property tax base and growth in the CEI. To summarize, the income tax base, which has grown in importance as a source of city revenues, is less persistent, more volatile

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5 Careful readers will notice a large decline in the personal income tax base in 1971, followed by an immediate rise in 1972. The data for these observations are calculated the same way as the other years, but it is possible that they are affected by the timing of the tax increase that took place in that year. Eliminating 1970 and 1971 from the data has no qualitative effect on the results in the tables.
and more sensitive to the economy than the property tax base.\textsuperscript{6}

\textit{The Evolution of New York City’s Tax Structure}

The shift in the source of New York City’s tax revenues from the property tax to the personal income tax was the result of both changes in tax rates and differential growth in the relevant bases. Figure 3 shows that the personal income tax base grew more between 1970 and 2002 than did the property tax base. Figure 4 shows that the personal income tax rate rose between 1970 and 2002 while the property tax rate fell.\textsuperscript{7}

New York City’s current tax rate structure makes the city’s revenues more sensitive to changes in the state of the city’s economy than it was three decades ago. In Figure 5, we compare the city’s tax structure as it actually evolved with the one that was in place in 1970. It is evident that the city raised rates overall after 1970, and the resulting system generated much more revenue ($43 billion in $1993) over the 30–year period than the city would have received had it left rates at their 1970 levels.\textsuperscript{8} Yet in spite of

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\textsuperscript{6} Another potentially important feature of a tax base is its relationship to the other tax bases. Although the growth rates of the income, sales, and corporate tax bases are positively correlated, the correlation between growth in the property tax base and growth in any of the other tax bases is near zero. Since the income and property taxes dominate the revenue system and their correlation is near zero, we do not focus on co-movements of the tax bases here.

\textsuperscript{7} The personal income tax rate depicted in Figure 4 is the rate faced by taxpayers in the top income bracket. The pattern of changes in the average rate is quite similar.

\textsuperscript{8} These figures are obtained by applying the 1970 rate to the observed base in each year, then aggregating across taxes. They thus ignore the possibility that changes in rates since 1970 have affected the bases on which they are levied. If that is the case, and Haughwout, Inman, Craig and Luce (2003) argue that it is, then this procedure overstates the aggregate revenue that the 1970 structure would have generated for those rates that ultimately fell (property) and understates it for those that rose (income, sales and general corporation).
this large overall increase in taxation, we estimate that the 1970 structure would have generated more revenue than the city actually received during the last two city downturns (1991–1992 and 2001–2002). The property tax base, which dominated the 1970 structure, is far less sensitive to the economy than the personal income tax base, which is more important now.

The city’s current (2002) revenue system is also less persistent than the 1970 system. Table 2 compares the features of the city’s current tax system with one based on 1970 rates. The source of the changes is the shift away from property taxes and toward income taxes. The income tax base is less persistent, more volatile and more sensitive to the local economy. It also tends to decline at the same time as the sales and corporate tax bases. Changes in the city’s tax structure have generated more tax revenue by relying more heavily on the least persistent and most economically sensitive base.  

THE EVOLUTION OF TAX SYSTEMS, REVENUE DYNAMICS AND ECONOMIC ACTIVITY

Why did New York City’s tax system evolve in this way? The decisions made by city officials reflect many factors, including the constraints of the FEA. These “hard” constraints force city officials to balance budgets, even though achieving balance may come at the cost of slowing the economy. Here, we discuss the interaction of institutional constraints and tax policy, and the effects of tax rate decisions on dynamic revenue variability and economic activity.

When budget officials are confronted with expected budget gaps, they may pur-

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Note that the volatility of the 1970 rate system is marginally higher than that of the 2002 system. This results from the fact that the overall variance of revenues is lower in the latter since the relatively high variance property tax is down-weighted. While the strength of persistence in revenues also declines, the reduction in overall variance essentially offsets this effect, leaving volatility little changed.
sue one of several courses of action. One possibility is to borrow or, equivalently, draw down public savings. For many state and local governments, borrowing to cover gaps in the operating budget is prohibited, but saving in the form of rainy day funds is encouraged. Both of these strategies require periods in which current revenues exceed current spending, either to accumulate savings or to repay borrowing. Thus, when the interest rate on borrowing and lending is the same, these are economically equivalent. In New York City, both saving and borrowing are essentially prohibited, making it an instructive example of the effect of binding liquidity constraints on subnational fiscal policy.

When expecting a budget gap, officials who face such binding constraints must choose between cutting expenditures and/or raising taxes. Concern that these constraints force state and local officials to undertake pro-cyclical fiscal policy has animated much recent academic and popular discussion of budget gaps at the state-local level. Here, we suggest that the effect of these constrained fiscal decisions on the dynamics of economic growth depends on the incidence of taxes and spending, particularly with regard to borrowing constraints.

To focus on main ideas, assume that expenditures are fixed in the short run, and that budget officials must raise taxes to close the budget gap. A representative taxpayer’s spending consists of two components—public and private. If she is constrained (like state and local governments) to equate current income with current spending, then a negative shock to her income will reduce both components, with the reduction in the public component appearing as reduced tax revenues received by local government. Assume for the purpose of illustration that taxes have no distortionary effect on her income. Then, neither tax increases to close the budget gap nor tax cuts to sustain private spending will affect aggregate spending.

Suppose, however, that some taxpayers do not face binding borrowing or lending constraints and are thus able to smooth their spending in the face of both positive and negative shocks. Then, state-local fiscal policy can affect the timing of demand. In this case, shifting tax burdens to those actors who can borrow or reduce saving in order to smooth their consumption has the potential to cushion a shock to income and reduce the volatility of aggregate spending.

If this logic is correct, then a borrowing constrained government that wishes to smooth the effects of the business cycle should transfer the shock to actors who are able to use borrowing and lending to smooth their spending. Such actors will likely be higher income residents or large businesses with access to credit. Note that tax officials must use the tax system to smooth both downturns and upturns in the economic cycle. If tax rate increases during a downturn are thought to be permanent, taxpayers will perceive a permanent negative shock to their income and decrease their current consumption accordingly. Increases in the top income

<table>
<thead>
<tr>
<th>Actual Revenues</th>
<th>Property</th>
<th>Income</th>
<th>Sales</th>
<th>Corporate</th>
<th>Revenue Characteristics</th>
<th>Persistence</th>
<th>Volatility</th>
<th>Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0.436</td>
<td>4.1</td>
<td>-0.008</td>
</tr>
<tr>
<td>Fixed 1970 Rates</td>
<td>3.71%</td>
<td>0.64%</td>
<td>3.0%</td>
<td>5.6%</td>
<td>—</td>
<td>0.548</td>
<td>5.9</td>
<td>0.347</td>
</tr>
<tr>
<td>Fixed 2002 Rates</td>
<td>2.40%</td>
<td>1.17%</td>
<td>4.0%</td>
<td>8.9%</td>
<td>—</td>
<td>0.329</td>
<td>5.8</td>
<td>0.552</td>
</tr>
</tbody>
</table>

Note: Persistence, volatility, and business cycle sensitivity figures are as described in Table 1.
tax rate during a downturn can effectively help to smooth shocks only if they are accompanied by reductions when revenue growth is strong.

While we cannot attribute a motivation to smooth the local economic cycle to New York City’s budget officials, the pattern of changes to the city’s progressive personal income tax is consistent with this story. Since 1970, the top rate on New York’s personal income tax has consistently moved in the opposite direction from the city’s economy (see Figure 4), cycling between 3.5 and 4.5 percent since 1971. The simple correlation between growth in the top rate and growth in the CEI is –0.45. The top rate for fiscal year 2004 will be 4.45 percent, almost precisely the level reached during the 1989–1993 downturn. Note that the top rate stayed at this level well into both the 1980s and 1990s expansions, but rose rapidly in 1989 as the CEI peaked.

If rate changes are instead used to raise permanent revenue, then the dynamic effect is a revenue system that is increasingly sensitive to the economy. That is, when the average share of revenue coming from cyclically sensitive tax bases is increasing over time, aggregate revenues will become more sensitive to the economy. In this case, future shocks will result in larger reductions in public sector revenues, and bigger gaps to be closed with “emergency” tax increases. The increases in income taxation that took place in New York between 1970 and 1975 have this character, and have, as noted above, made the city’s aggregate revenues more sensitive to the economy. The share of total revenues raised by the income tax has continued to grow since 1975 as the property tax rate has fallen. Since 1975, changes in the city’s income tax rate have been more consistent with smoothing, although reductions in rates during upturns tend to be more gradual than the increases during downturns.

Increased reliance on cyclically sensitive taxes incident on relatively unconstrained agents may require more frequent rate adjustments, but may result in a smoother path for aggregate economic activity than would have occurred had governmental revenue been drawn from more stable taxes incident on more constrained households. When the public sector is borrowing constrained, as most states and localities are, minimizing pro–cyclical changes in (combined public and private) current spending may require transmitting shocks to unconstrained households, who can offset them, in part, by borrowing and saving.

In New York City, the combination of a rigid requirement for ex ante balance, a prohibition against rainy day funds and variable tax bases has been associated with increasing reliance on the city’s least stable and most economically sensitive revenue source—the personal income tax. While careful monitoring and hard constraints on borrowing and saving have done New York much good, they have not eliminated periodic budget crises. Indeed we argue that tax policy changes made since 1970 have made them more likely. While this suggests a potential concern about such constraints, it is important to note that the city’s changing tax policy may have concomitantly reduced the amplitude of the city’s business cycle.

This view of the effect of balanced budget constraints on revenue variability and sensitivity to the economic cycle differs from both popular accounts and the prevailing view among scholars of state–local public finance. Sobel and Wagner (2003), for example, argue that states should increase their reliance on smoother tax bases to reduce revenue volatility. They suggest in particular the addition of food expenditures to the sales tax base. Such a change would reduce revenue variability across the business cycle since food expenditures are relatively insensitive to the state of the economy. Yet compared to
adjusting income tax rates on relatively wealthy households, such a change to the sales tax seems likely to shift burdens from less constrained to more constrained households, offering no cushion to the business cycle.

The idea that taxpayers’ differential ability to borrow and save has implications for the economic effect of government behavior is a common feature of macroeconomic discussions of fiscal policy (Auerbach and Kotlikoff, 1998; see especially Chapter 6 and pp. 214–216). Applications of these models are often to the federal government sector, which itself has the ability to borrow. Balanced budget requirements and taxpayers’ differential ability to borrow and save should, in our view, be an important aspect of future state–local fiscal analyses.

There are several important aspects to this research agenda. First, it is necessary to determine how binding the constraints on state–local governments really are. While the existence of balanced budget requirements for states and localities is well known, there exists some evidence that they vary in their restrictiveness (e.g., Bohn and Inman, 1996). If state and local governments can save during upswings and/or borrow (or dissave) during downturns, then the problem of pro-cyclical state–local fiscal policy is likely less severe than some have argued. If state and local officials are in fact borrowing constrained, then a second question concerns whether the fiscal changes enacted in response to economic shocks are incident on actors who are able to smooth their private consumption through borrowing and lending, and if so, why. These incidence questions are by no means easily answered, but in our view, are crucial to a better understanding of the effects of state and local fiscal policies. Armed with the answers to these questions, researchers will be better positioned to describe economically efficient state and local fiscal institutions.

**CONCLUSION**

When governments subject to binding borrowing constraints encounter negative revenue shocks, they face the difficult choice of raising tax rates or cutting expenditures. Not all tax increases have the same dynamic properties, however; permanent increases in rates on sensitive bases will mean that the next shock will likely be larger, resulting in larger budget gaps. In New York City, the personal income tax, with a base that is more cyclically sensitive and volatile than the property and sales taxes, has seen rate increases during downturns since 1970. The result has been a revenue system that is increasingly sensitive to short run changes in the economy.

An important question is how much state–local revenue fluctuations matter. One concern is that institutional balanced budget constraints demand pro-cyclical tax increases and spending reductions. Standard analyses, however, do not consider potential differences in liquidity constraints among private sector actors. By using the tax system to transmit shocks to and from those who can borrow and save to smooth current consumption, state–local fiscal policy may be able partially to smooth shocks to aggregate demand. In New York City, taxation decisions appear to be consistent with this objective, but other motivations may easily underpin the city’s taxation decisions.

This paper intentionally asks many more questions than it answers. We know relatively little about the objective functions of budget officials in the face of economic shocks, and perhaps even less about the incidence of changes in fiscal policy in response to institutional constraints and the business cycle. What can be said for certain is that the causes and effects of state and local revenue variability merit further study, as the sector’s size and importance make a thorough
understanding of its behavior crucial to effective economic policy making.

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