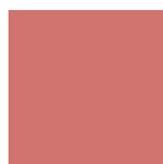
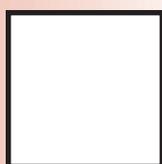


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State and Local Government Finance Amid Economic Turbulence

*Proceedings of a conference co-hosted by the Federal Reserve Bank of St. Louis
and the Weidenbaum Center on the Economy, Government, and Public Policy
at Washington University in St. Louis, April 9, 2010*

The State of State and Local Government Finance

Ronald C. Fisher

State Tax Revenue Growth and Volatility

Gary C. Cornia and Ray D. Nelson

States in Fiscal Distress

Robert P. Inman

Can State and Local Governments Rely on Alternative Tax Sources?

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Panel Discussion: The Future of State and Local Government Finance

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Commentaries

Elizabeth C. McNichol, Paul Rothstein, Gary A. Wagner

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State and Local Government Finance Amid Economic Turbulence

1

Editor's Introduction

Thomas A. Garrett

4

The State of State and Local Government Finance

Ronald C. Fisher

23

State Tax Revenue Growth and Volatility

Gary C. Cornia and Ray D. Nelson

59

Commentary

Elizabeth C. McNichol

65

States in Fiscal Distress

Robert P. Inman

81

Commentary

Paul Rothstein

88

Can State and Local Governments Rely on Alternative Tax Sources?

William F. Fox

102

Commentary

Gary A. Wagner

108

Panel Discussion: The Future of State and Local Government Finance

Robert Tannenwald and Chris Edwards

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Editor's Introduction

Thomas A. Garrett

The Federal Reserve Bank of St. Louis co-hosted a one-day conference on state and local public finance on April 9, 2010. Our co-host was the Weidenbaum Center on the Economy, Government, and Public Policy at Washington University in St. Louis. The purpose of the conference, titled “State and Local Public Finance Amid Economic Turbulence,” was to provide attendees with a nontechnical description of the major issues surrounding state and local public finance during the recent economic crisis and ongoing recovery.¹

To provide diverse views and experiences, the conference brought together state and local government officials, economic development professionals, academics, and local government policymakers. The conference format consisted of presentations of papers by academic scholars and a panel session involving recognized experts on state and local public finance. This issue of *Regional Economic Development* contains the proceedings from the conference.

THE CURRENT STATE OF STATE AND LOCAL PUBLIC FINANCE

Ronald Fisher, professor of economics at Michigan State University, provided the keynote address. Fisher provides an overview of the state and local government sector and a review of the

short-run impacts of the recent recession on state and local governments. He notes that governments currently face nearly unprecedented fiscal turmoil as a result of the 2007-09 recession. Fisher argues that despite an economic recovery, state and local governments will continue to face challenges both to improve effectiveness and efficiency in the provision of public services and to generate revenue sufficient to fund crucial public services.

AN ECONOMIC EVALUATION OF STATE AND LOCAL TAXES

Ray Nelson explores the relationship between the growth and volatility of state tax revenue. He argues that policymakers should carefully anticipate and consider the potential effects of proposed tax reforms and revenue enhancements on the long-term growth and volatility of state government revenue portfolios, especially during economic downturns. Nelson notes that although states cannot alter the volatility and growth rates of their economies, they can change the composition of their tax portfolios to minimize the effects of the business cycle on states' fiscal health. For this reason, state officials need to consider the natural tendencies of their economies when formulating tax policy.

In her discussion, Elizabeth McNichol argues that state revenue will not recover from its current depressed level until employment returns to normal levels, which is expected to take several more years. She estimates that states are facing budget shortfalls

¹ More information on the conference can be found at <http://research.stlouisfed.org/conferences/turbulence/>.

Thomas A. Garrett is an assistant vice president and economist at the Federal Reserve Bank of St. Louis.

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in fiscal year 2011 that are just as large as those they closed in fiscal year 2010 and that these problems will continue into 2012 and beyond. McNichol also presents several reasons that complicate measuring the growth and variability of state revenue—namely, changes in state tax rates and tax bases that occur over time.

FISCAL FEDERALISM IN THE UNITED STATES

Robert Inman discusses the fiscal relationship among various levels of government, known as fiscal federalism. Specifically, he evaluates the recent American Relief and Recovery Act (ARRA) as relief for states in fiscal distress. Inman finds that while the Act did provide significant aggregate fiscal relief to all state governments, the allocation of the program's funds provided at best weak relief for the states in greatest fiscal distress. The majority of each ARRA dollar went toward increased funding of state services generally or to new programs favored by Congress and the Obama administration. In place of federal assistance, Inman argues that each state should maintain a budget stabilization fund, or “rainy day” fund, equal to at least 10 percent of state expenditures to weather downturns in revenue. The best way to encourage such behavior, according to Inman, is for Congress to commit to no future federal bailouts of states in fiscal distress.

In his discussion, Paul Rothstein focuses on the efficiency of federal fund transfers to state governments and outlines several reasons why federal-to-state transfers may increase or decrease economic efficiency. Rothstein questions the existence of “moral hazard” in federal-to-state bailouts such as the ARRA; that is, state governments take excessive risk because they presume federal bailouts will supplant any losses, since political leaders are often punished for bad outcomes regardless of federal support to the states. He argues that an effective and efficient policy can be developed that delivers federal support during crises for qualifying states, encourages transparent budgeting and larger stabilization funds, and need not present moral hazard problems.

ALTERNATIVE REVENUE SOURCES AND IMPLICATIONS FOR GROWTH

William Fox evaluates selective sales taxes (taxes on alcohol, tobacco, and gambling) and business gross receipts taxes in terms of the characteristics of a good tax system: economic efficiency, adequacy, and equity. Rather than increasing tax rates on existing traditional taxes (corporate income, personal income, taxable retail sales) or expanding tax bases, in recent years state governments have been considering nontraditional forms of taxation as alternative revenue sources. Fox argues that (i) competition between states for gambling and sales of alcohol and tobacco will likely make it increasingly difficult for tax rates on nontraditional sources to rise dramatically higher and (ii) cross-border shopping and bootlegging will limit states' ability to push tax rates dramatically higher. The result will be that revenues from these sources will fall relative to total state tax revenues over the longer term. He also discusses many of the advantages and disadvantages of the gross receipts tax versus the corporate income tax and concludes that much more study on the economic effects of each tax is needed before enacting good public tax policy.

In his discussion, Gary Wagner notes that states' increasing reliance on nontraditional sources of revenue, such as selective sales taxes and gross receipts taxes, is in part due to the growth and variability problems facing traditional sources of tax revenue. Specifically, he notes that the U.S. economy has experienced a well-documented shift away from goods toward services in both production and consumption and that, combined with the increasing importance of “knowledge-based” production, sales tax bases are shrinking relative to the value of economic activity. In addition, since World War II state governments have become increasingly reliant on individual income tax revenue and less reliant on alcohol, tobacco, and motor fuel tax bases that are significantly less volatile over the business cycle. Wagner concludes by expanding on the advantages and disadvantages of the gross receipts tax and notes concern that the political appeal associated with a low gross receipts tax rate and its broad base tax will lead

policymakers to rapidly move toward some form of a gross receipts tax without a solid understanding of the consequences.

PANEL DISCUSSION: THE FUTURE OF STATE AND LOCAL PUBLIC FINANCE

The final session of the conference, a panel discussion, focuses on the future of state and local public finance. The panelists are Robert Tannenwald from the Center for Budget and Policy Priorities, Chris Edwards from the Cato Institute, and Karl Kurtz from the National Council of State Legislatures.² They discuss several issues, including the proper size of state governments in terms of expenditures and taxation, whether a more

dynamic economy is making the current tax systems of state and local governments obsolete, and innovative revenue-generating strategies for state governments.

ACKNOWLEDGMENTS

I thank the authors, discussants, and panelists for their participation. I also thank the Weidenbaum Center at Washington University in St. Louis for their professional partnership in organizing this event. Finally, I thank the managing editor of *Regional Economic Development*, George Fortier, and his staff, Judy Ahlers, Lydia Johnson, and Donna Stiller, for their fine work in putting the conference proceedings together.

² Karl Kurtz's comments were not available for publication.

The State of State and Local Government Finance

Ronald C. Fisher

This paper provides an overview of the state-local government sector, a review of the short-run impact of the 2007-09 recession on state and local governments, and a brief summary of key long-run challenges state and local governments will encounter in the next decade. State and local governments in aggregate represent about one-seventh of the U.S. economy, with education and welfare (mostly Medicaid) accounting for more than half. These governments currently face nearly unprecedented fiscal turmoil as a result of the recent recession. Even after the economy recovers, states and localities will face challenges both to improve effectiveness and efficiency in public service provision and to generate revenue sufficient to fund these crucial public services. (JEL E62, H1, H7)

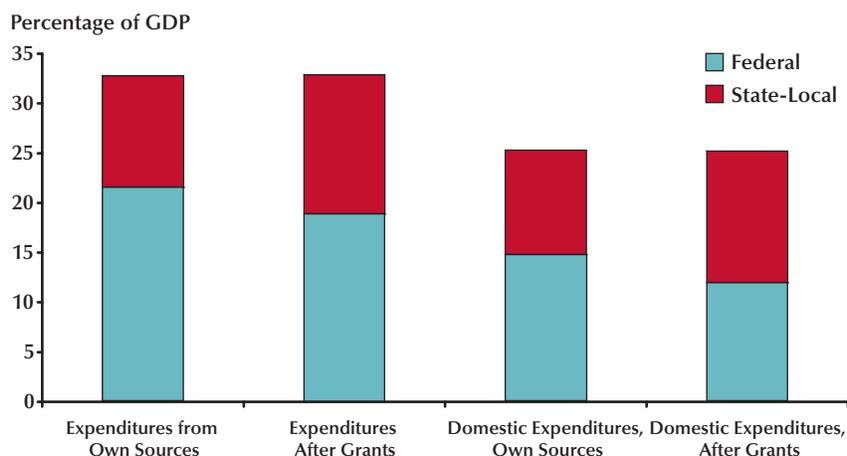
Federal Reserve Bank of St. Louis *Regional Economic Development*, 2010, 6(1), pp. 4-22.

The recession that began in late 2007 certainly is the most recent factor creating turbulent times for state and local governments. Some would say the current environment may be more reflective of a cyclone than mere turbulence, although the first decade of this century has been a continuing period of transition for these governments. After an era of remarkable growth from the end of World War II until the mid-1970s, these governments experienced remarkable stability from the mid-1970s to the end of the century. In the first decade of the twenty-first century, however, major structural changes in the economy, substantial demographic shifts, a blurring of the distinction between the private and public sectors, and now a long and deep recession have combined to alter the fiscal environment and behavior of these governments. The obvious issues are the nature of these factors influencing state and local governments to change, how these governments are responding, and what happens next.

Demographic changes—including aging of the population, changes in ethnic composition, and regional population shifts—have affected both service demand and productivity of the existing revenue structure. The decline of manufacturing and the corresponding growing importance of service, information, and financial industries also have had a dramatic effect. States have discovered that their tax structures may be poorly designed for the new economy and that reforms to the tax system are elusive. The increasing income inequality resulting in large part from the economic restructuring has increased the demand for a variety of state and local services, notably welfare and education. The rising relative cost of energy and increasing environmental concerns are additional factors pushing states and localities to develop or adopt new technologies for service provision. Certainly the recession has had a severe impact, but even after the economy recovers, state and local governments will continue to be affected by these long-term trends.

Ronald C. Fisher is a professor of economics at Michigan State University. The author thanks Amarpreet Jhita and Ravi Shah, undergraduate research assistants at Michigan State University, whose work was invaluable in tabulating and reporting data used in this paper. He also appreciates the assistance of the Governments Division of the U.S. Census Bureau, especially Christopher Pece and Stephen Owens, who arranged early access to Census of Governments data.

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Figure 1**Government Expenditures as a Percentage of Personal Income**

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis.

These issues are reviewed in this paper, beginning with an overview of the state-local government sector. How large is it? Where does their money come from? How is the money spent? How do states differ from each other? Attention then turns to the key short-term policy issue: the aftermath of and response to the recession. To what degree have states responded with tax increases compared with expenditure reductions, and is there a preferred source for additional revenue? Finally, a number of fundamental long-term policy issues—key issues to resolve over the next 10 years—are noted, including the structural problems with the revenue system and challenges to service provision.

AN OVERVIEW OF THE STATE-LOCAL SECTOR

The Magnitude of State and Local Governments

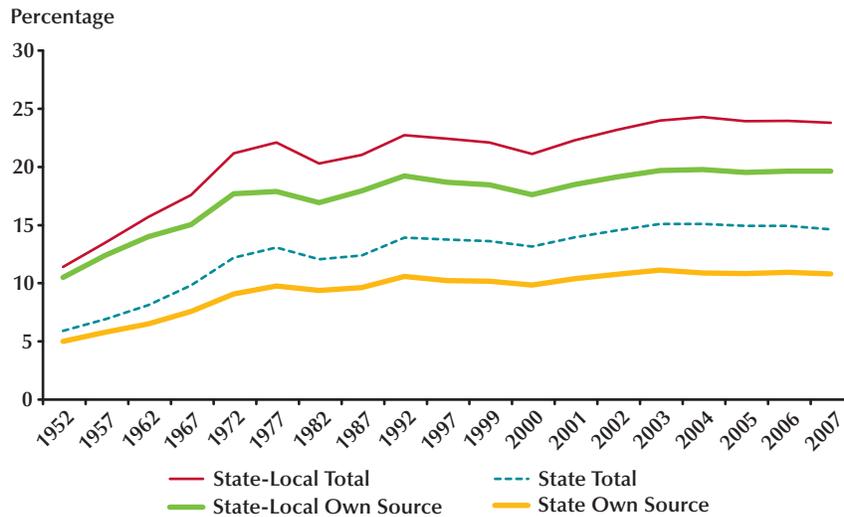
The state-local sector is an exceptionally important component of the U.S. economy, much more so than is often recognized. Individuals and federal officials may think only of their own state or city, which may indeed be small, but the aggregate impact of states and localities is substantial. In 2008,

state and local governments spent nearly \$9,000 per person. Spending by the sector accounted for about 14 percent of gross domestic product (GDP), double the share represented by consumer purchases of durable goods. State and local governments employ about 1 in 8 of all workers in the nation. When spending is measured by the levels of government that actually make the final expenditures (after accounting for grants received from higher-level governments), the state-local sector accounts for 43 percent of aggregate public spending and 52 percent of domestic public spending (excluding defense and international expenditures) (Figure 1). Perhaps most important, state and local governments are responsible for the public services most apparent to citizens, including education, health and welfare, transportation, public safety, and water and sanitation.

State-local spending grew much faster than income in the 1950s, 1960s, and most of the 1970s but has remained between 20 and 24 percent of personal income since the late 1970s (Figure 2). Compared with changes in population and inflation, real spending per person increased from 1950 to 2000, and especially fast from 1950 to 1990, but has remained essentially constant over this decade.

Figure 2

State and Local Expenditures as a Percentage of GDP: 2008



SOURCE: U.S. Census Bureau (State and Local Government Finance).

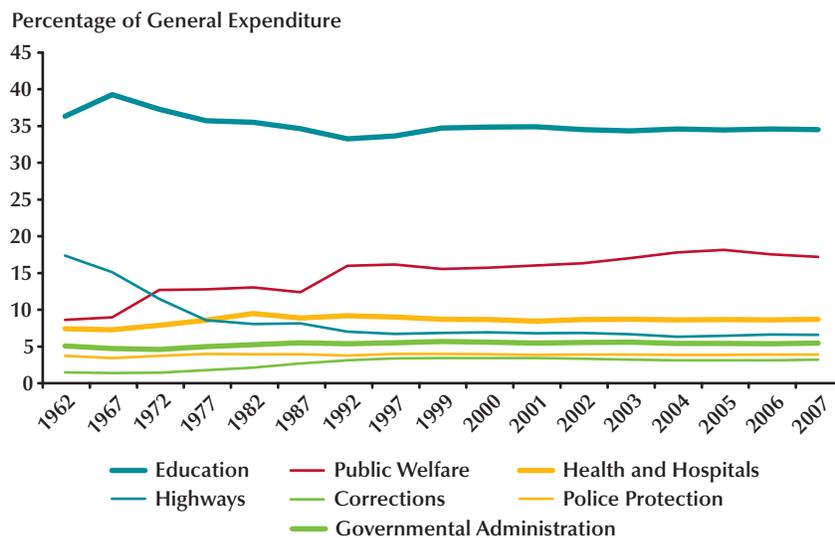
Types of Services and Expenditures

Two categories—education (35 percent) and welfare (17 percent, which includes Medicaid)—account for more than half of state-local spending. No other single category accounts for more than 10 percent of aggregate spending, including highways (7 percent), government administration (5 percent), police protection (4 percent), and corrections (3 percent). Government administration may be particularly noteworthy, as critics sometimes argue that state-local fiscal problems could be eliminated simply by cutting government “overhead” and reducing the number of officials, a claim that seems dubious given its low, 5 percent share of the total budget. There are important differences between state and local government spending patterns. Welfare, including Medicaid expenditure, is the largest spending category for state governments (21 percent), whereas education (38 percent) is the largest spending category for local governments. Both categories are a bit deceptive, however, as a large portion of state spending for Medicaid is funded by grants from the federal government, and

state governments provide substantial grants to cities and school districts to fund education.

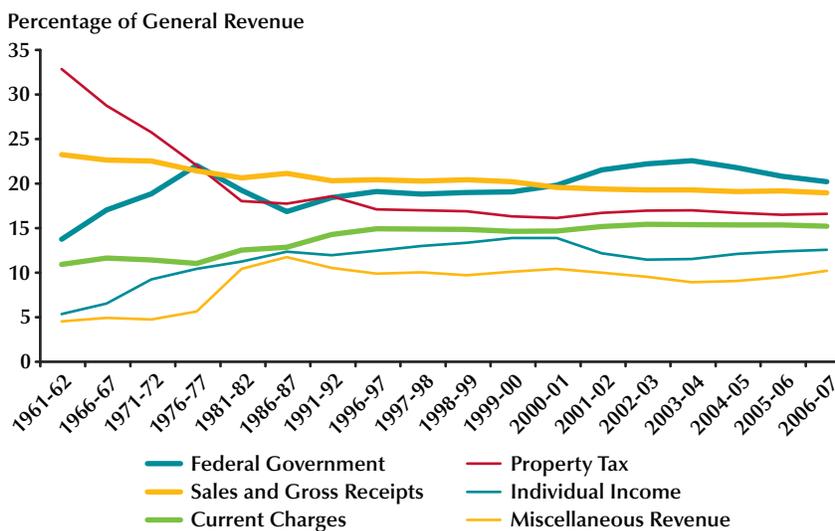
The composition of aggregate state-local budgets has been remarkably stable for 30 years, with education and public welfare accounting for about half of total spending (Figure 3). Taking a longer view, welfare spending increased as a share of the total budget, fueled initially by anti-poverty programs in the 1960s and then by Medicaid in recent decades. In contrast, expenditure for highways has not increased as fast as total spending, as construction of major roads and highways was completed and spending turned more to maintenance than expansion. Although the aggregate composition of state-local spending has not changed appreciably, there have been important changes within spending categories. For example, the share of education spending for K-12 schools increased, whereas the share for higher education institutions declined. Similarly, cash grants to low-income families have declined as a share of welfare spending, more than replaced by spending for health care.

Figure 3
Distribution of State-Local General Expenditure



SOURCE: U.S. Census Bureau (State and Local Government Finance).

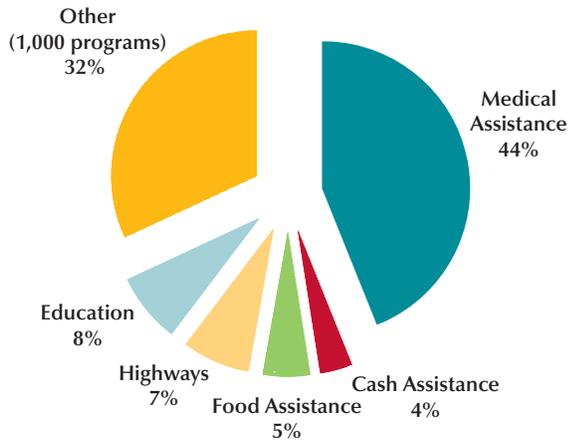
Figure 4
Distribution of State-Local General Revenue



SOURCE: U.S. Census Bureau (State and Local Government Finance).

Figure 5

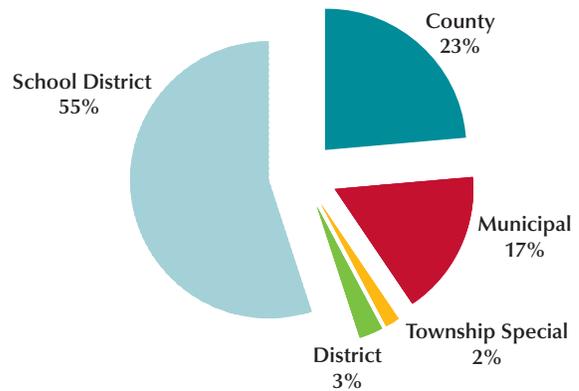
Federal Aid to State and Local Governments: 2008 (Total \$469.8 billion)



SOURCE: U.S. Census Bureau (State and Local Government Finance).

Figure 6

Distribution of State Aid by Type of Local Government: 2007 (Total \$446.7 billion)



SOURCE: U.S. Census Bureau (State and Local Government Finance).

Sources of Revenue

As shown in Figure 4, for the past 20 years state and local governments in aggregate have had a stable and balanced revenue structure based on five roughly equal major sources: federal aid (20 percent), sales and gross receipts taxes (18 percent), property taxes (17 percent), current charges and fees (15 percent), and individual income taxes (13 percent). Again, states differ a bit from local governments, with sales and excise taxes providing the largest source of own-source state revenues (24 percent) and property taxes the largest source of local revenues (28 percent). Since the early 1960s, the property tax and sales tax categories have declined in relative importance, whereas those for income tax and charges have increased.

As with spending, the apparent stability of this balanced revenue structure masks important changes within each tax category. For all three major state-local taxes, tax bases have been narrowed both by policy decisions and changes in the economy. Sales taxes apply to a smaller fraction of purchases largely because of the growth of spending on services and online purchases. Income taxes

now apply to a smaller fraction of income because exempt forms of income have grown in importance. And property tax exemptions for industrial and commercial properties intended to spur local economic development have reduced property tax bases.

Intergovernmental Relationships

Intergovernmental fiscal flows (resource transfers) between governments are an inherent characteristic of federal systems and particularly important fiscally in the United States. State governments receive 28 percent of their revenue from the federal government; local governments receive 4 percent from the federal government and 34 percent from state governments. The interdependence flows in both directions—federal and state governments provide substantial financial support to lower levels, and federal and state governments rely on states and localities, respectively, to provide services effectively with those funds.

Intergovernmental fiscal flows in the United States are especially important for the two largest subnational government service areas (Figures 5 and 6): school districts, which receive the largest

component of state aid, and medical assistance (mostly Medicaid), which receives the largest component of federal aid. As a result, local K-12 public education institutions receive 55 percent of their revenue from the state and federal governments, whereas state welfare expenditures receive 60 percent of their funding from the federal government.

Fiscal Diversity

This aggregate perspective of the state-local sector can be deceiving, however, because individual states or localities *usually* differ from the mythical “average” state or locality. Indeed, fiscal diversity is the fundamental and essential characteristic of federal systems. Individual state and local governments have substantial autonomy to select fiscal structures that best reflect their citizens’ desires or are optimal for that jurisdiction’s economic and social circumstances. Without diversity, there is little reason for subnational governments. If all states had identical laws, taxes, and public services, there might as well be only one.

In fact, state and local governments in the United States differ substantially in structure, levels of spending and revenue, sources of revenue and categories of spending, and the institutional characteristics of taxes and expenditure programs. It is impossible in this brief overview to detail all of these differences, but a few examples can serve well to illustrate the nature and magnitude of the variation.

Spending differences among states remain large, influenced by variation in the desired quantity or quality of services demanded, differences in costs of providing public services, and even differences in which services are deemed to be public responsibility. In 2007, state-local spending per person varied from more than \$12,000 (in Wyoming) to about \$6,000 (in Tennessee).¹ The information in Table 1 reveals that state spending differences declined substantially during the past century; in 1982 the difference between the highest- and lowest-spending states was relatively greater than in 2002. But spending differences apparently have

widened again this decade, as the ratio of the highest to lowest is larger for 2007 than in 2002.

Diversity also exists among state revenue systems. Individual states often use less-balanced revenue structures than is true for the full sector. Nine states have no income taxes. Although 46 states have general sales taxes, only 14 tax food purchases. Often, state tax structures are designed for the economic conditions in that state. For instance, Florida and Hawaii rely on sales taxes to take advantage of their many visitors; states with substantial mineral deposits, such as Alaska, Louisiana, Montana, and Wyoming, rely disproportionately on severance taxes; and Oregon (income tax, no sales tax) and Washington (sales tax, no income tax) have selected tax structures essentially opposite despite their neighboring location partly because of the differences in the two states’ economies. Perhaps nothing better illustrates the variety among states as much as the differences in tobacco excise taxes, which vary from \$3.46 per pack of cigarettes (in Rhode Island) to \$0.07 per pack (in South Carolina, naturally).

SHORT-TERM POLICY ISSUE: THE EFFECT OF AND RESPONSE TO THE RECESSION

The recession that began late in 2007 has imposed a nearly unprecedented fiscal decline on state and local governments. As shown in Figure 7, tax revenue for the overall sector declined for four consecutive quarters beginning in the third quarter of 2008. The changes by type of tax are shown in Figure 8; only the property tax maintained stability and continued to grow into 2009. As a consequence, *nominal* state-local tax revenue during calendar year 2009 was less than both 2007 and 2008 and about at the same level as 2006. The decrease in state-local tax revenue was led by dramatic declines in the individual income tax, which decreased more than 25 percent in the second quarter of 2009.

The effect on the revenue of state governments alone was substantially greater than for the sector as a whole because most state governments did not have the benefit of a stable property tax. State

¹ This excludes Alaska and Washington, D.C., jurisdictions with even higher per capita expenditure but special circumstances that make comparisons to other states deceptive.

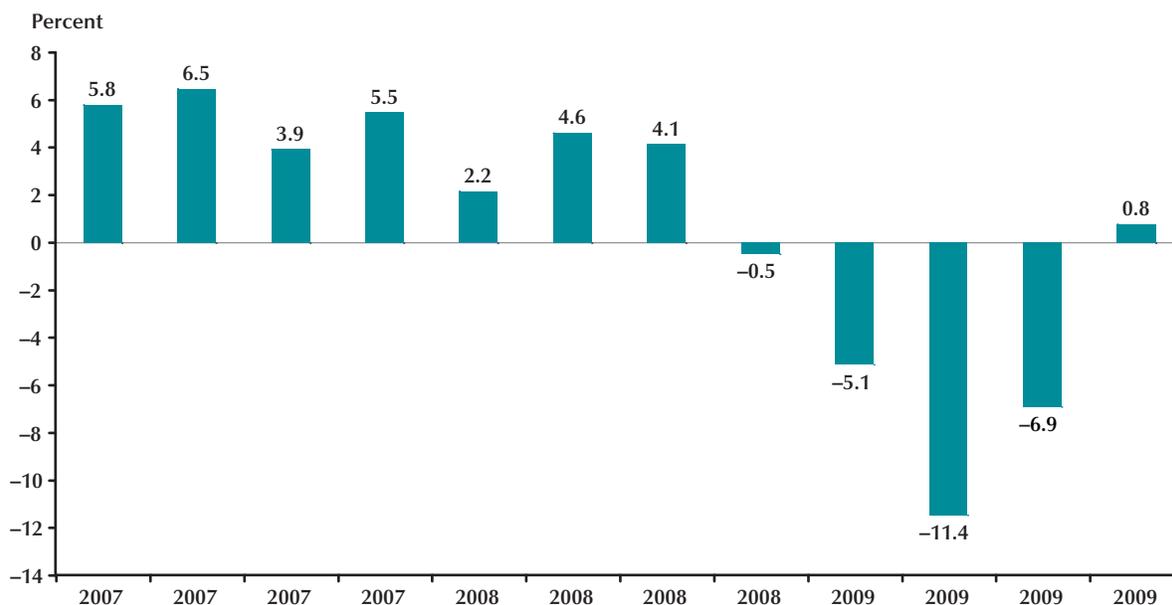
Table 1
Variation in Per Capita State-Local General Expenditure

Year	States	Mean (\$)	Coefficient of variation	Maximum (\$)	Minimum (\$)	Maximum-to-minimum ratio
1982	All	1,992	0.47	7,958	1,345	5.9
1992	All	3,900	0.30	9,893	2,751	3.6
1998	All	5,224	0.23	11,502	4,037	2.9
2002	All	6,217	0.23	13,466	4,889	2.8
2007	All	7,832	0.24	15,595	6,025	2.6
1982	All, excluding Alaska and Washington, D.C.	1,841	0.19	3,157	1,345	2.3
1992	All, excluding Alaska and Washington, D.C.	3,708	0.17	7,788	2,751	2.1
1998	All, excluding Alaska and Washington, D.C.	5,025	0.12	7,351	4,037	1.8
2002	All, excluding Alaska and Washington, D.C.	5,856	0.13	8,523	4,889	1.7
2007	All, excluding Alaska and Washington, D.C.	7,383	0.16	12,024	6,025	2.0

SOURCE: U.S. Census Bureau (State and Local Government Finance).

Figure 7

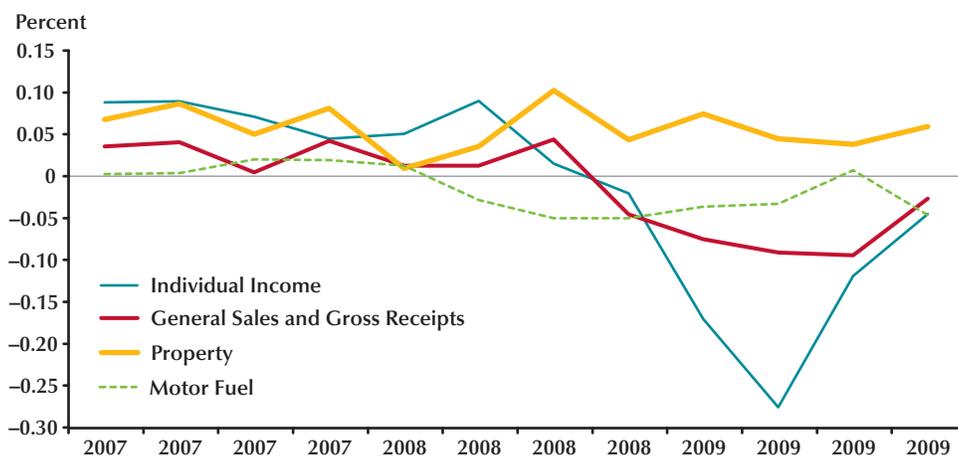
Percentage Change in State-Local Tax Revenue (quarter over quarter)



SOURCE: U.S. Census Bureau (Quarterly Summary of State & Local Tax Revenue).

Figure 8

Percentage Change in State-Local Tax Revenue by Tax Category (quarter over quarter)



SOURCE: U.S. Census Bureau (Quarterly Summary of State & Local Tax Revenue).

government tax revenue has declined for five consecutive quarters, through the fourth quarter of 2009 (and preliminary estimates at the time of this writing suggest a further decrease for most states in the first quarter of 2010). The decreases were so large that state government *nominal* tax revenue in calendar year 2009 was at about the same level as 2005; essentially, state governments lost three years of revenue growth.

State and local governments responded in a number of ways to the recession, as one might expect. Declining revenue coupled with increased demand for services caused states to face potential deficits, or “budget gaps,” of more than \$60 billion for fiscal year (FY) 2009 and more than \$120 billion for FY 2010, according to the National Governors Association and the National Association of State Budget Officers (NGA and NASBO) estimates. About 30 states raised taxes or fees for FY 2010, including 12 that increased the income tax, mostly for higher-income taxpayers. But the number of states increasing various excise taxes or various charges and fees was much greater (NGA and NASBO). States and localities also benefited from federal stimulus support provided by the American Recovery and Reinvestment Act of 2009 (ARRA)—about \$140 billion for the period July 2008 to December 2010, intended to increase federal government financing of Medicaid and support state financing of public education. By all accounts, ARRA funding had its largest effect in FY 2010. Even with tax increases and more federal support, states still enacted cost-saving measures and reduced spending by about 4 percent in 2009 and an additional 5 percent in 2010.

The conventional wisdom since World War II had been that state and local governments in aggregate have been a countercyclical force during recessions, using reserves and tax increases to maintain, or even increase, spending. As noted by Robert Rafuse (1965) in a classic article, “abstracting from trend, state and local expenditures have been a stabilizing factor in the economy during every post-war expansion and contraction.” Such a policy was supported by the development of “rainy day,” or budget stabilization, funds in many states and the automatic (unemployment compensation, federal matching funds for Medicaid, food stamps,

and so on) and discretionary federal support that flows to states during recessions.

The current response by state and local governments to the recent recession seems to be different from that to previous recessions, however, as shown by the analysis in Table 2. Comparing the 2010 response to the 2007-09 recession with the 1984 response to the 1981-82 recession, which was the last economic decline of a similar magnitude, reveals the following. In the current cycle, state and local governments have had smaller relative revenue increases and larger relative spending decreases, with relatively less reliance on broad-based taxes (income and sales) and relatively more reliance on narrow excise taxes (tobacco, alcohol, gambling). In 1984, spending decreases totaled less than 1 percent because 29 states increased taxes by a total of more than 3.1 percent of aggregate revenue. In 2010, spending decreases totaled more than 5 percent, whereas 30 states increased taxes by a total of only about 1.75 percent of aggregate revenue.

A number of factors may account for the difference, but one is clear. States acted in the 1990s and earlier in this decade to reduce taxes substantially—relatively more than in the past. From 1994 through 2001, when the economy was growing rapidly, states acted explicitly to reduce taxes substantially. Then for FYs 2005-06 through 2008-09, about half the states acted in each prior year to reduce taxes or tax rates. Indeed, states acted 62 times in this later period to reduce income taxes, with a net reduction of about \$4.4 billion. So, state and local governments took advantage of periods of economic growth to reduce tax rates, which both limited the buildup of reserves and made these governments vulnerable to subsequent economic declines.

With expectations that employment and income will grow slowly and that federal stimulus support will end in 2010, it is projected that states will face potential deficits for FY 2011 and FY 2012 in the magnitude of \$55 to \$70 billion annually (NGA and NASBO). What should states do? Many options have been used already. As noted, expenditure reductions were greater than revenue increases for 2010, even though more than half of the states increased taxes. State-local employment was reduced, wages were cut, state grants to local gov-

Table 2
State Fiscal Actions in Recession Periods

Fiscal year	States increasing revenue*	Amount of revenue increase* (\$ billion)	Percentage of state general revenue*	Income tax and sales tax increases*	Percentage of state budget change*	Peak unemployment rate (%)
1984	29	10	3.10		-0.7	10.8
1992	31	15	2.50	20; 18	5.1	7.8
2003	23	8	0.65	5; 11	1.5	6.3
2010	29	24	1.75 (estimate)	10; 8	-5.4	10.1

NOTE: *At the time budgets were enacted.

SOURCE: NGA and NASBO (*The Fiscal Survey of the States*).

Fisher

ernments were reduced, and funds from available balances and reserves were shifted to cover budget gaps. My expectation is that tax increases will be necessary. Indeed, I believe they are desirable. And if tax increases are warranted, I suggest that state income taxes seem the best revenue option.

Maintaining state services and spending, even with tax increases, will have a positive effect on the recovery. Spending by state and local governments can provide important stimulus to both local and national economic recovery, especially when spending by consumers is weak. Some may be concerned about increasing taxes during the downturn, but it is difficult to understand how laying off teachers and police officers, wage reductions, lowering reimbursement to health care providers, or reducing maintenance or construction of public facilities will help the economy grow.

Income taxes are the fairest source of additional revenue, especially given the differential effects of the recession. Unemployment remains high, and workers in some industries who are still employed have made wage concessions. Workers in strong or growing businesses have, in contrast, enjoyed wage increases. Income tax increases are collected from those still working in proportion to earnings. Individuals faring the best during the recession and recovery pay the most, and tax increases may even be targeted to higher-income taxpayers through the use of graduated rates. By contrast, even people who are out of work may pay sales taxes or excise taxes on such things as gasoline, cigarettes, or alcohol.

Income tax rate increases, even if temporary, provide the best prospect for future revenue growth as economic conditions and employment improve. Research shows clearly that income taxes have the largest long-run revenue elasticity and thus respond much more in the long run to economic growth than either excise taxes or general sales taxes. Indeed, that is precisely why income tax revenues declined so drastically during the recession. As employment and income grow, states will want to generate revenue to replace the lost federal stimulus funds, reinstate service reductions required by the recession, and rebuild balances and state rainy day funds in preparation for the future. Income taxes provide states and localities

the best opportunity to accomplish these goals quickly.

Income tax increases, especially if targeted to higher-income taxpayers, are effectively a way for states to leverage additional stimulus support from the federal government. Because state-local income taxes are deductible in calculating federal income tax for individuals who itemize deductions, a \$100 increase in state taxes costs a taxpayer in the 35 percent tax bracket as little as \$65. The difference is reduced federal tax. Thus, for every \$100 of additional income tax revenue received by states and localities, residents pay substantially less; the remainder is effectively additional federal stimulus.

Finally, as shown in Figure 8, income taxes declined more than any other state-local revenue source since 2005 because of direct state decisions and the recession. When the economy was growing, states acted to reduce income taxes or income tax rates. When the recession hit, income taxes were affected more than any other source of funding for states and localities. Temporary income tax increases as the recovery begins and accelerates would simply replace that lost revenue. If states are going to reduce tax rates during periods of economic growth, rather than using the growth to establish substantial reserves, then it seems reasonable for them to increase tax rates when the economy (and revenue) is not growing.

LONG-TERM POLICY ISSUES

Revenue Structure

Substantial economic, demographic, and technological changes have already affected state and local government revenues greatly. With the prospect of these changes continuing, or even intensifying, state and local governments are expected to continue to consider a number of substantial reforms to their revenue structure. Five of these crucial challenges are noted briefly below:

- (i) State and local income taxes often provide preferential treatment for retired individuals by taxing the types of income earned by retired individuals at lower rates than other forms of income and by providing additional exemptions or credits. With the population

aging and relatively more retired individuals, the cost of such preferential treatment is expected to increase greatly. This issue is considered in greater detail below.

- (ii) Most state and local retail sales taxes were designed initially to apply to sales of tangible property and thus, even today, often do not apply to sales (or consumer purchases) of most services. As the consumption of services continues to represent a rising share of consumer spending, the exemption of services means that sales taxes apply to a declining share of spending. Over time, therefore, sales tax revenue will not increase as fast as consumer spending and higher tax rates may be necessary. There also may be important distributional effects because those taxpayers who buy relatively more services pay less tax.

The Federation of Tax Administrators (2008) reports that of 168 specific services identified, only 8 states tax the sale of at least half of those services and only 23 tax more than one-third. Only about half of the states tax ticket sales for entertainment and sporting events, and professional services by doctors, lawyers, and so on are taxed in only seven states. In contrast, Hawaii and New Mexico are known for having broad-based sales taxes that include most of these services.

- (iii) State and local sales taxes were designed as “destination-based” taxes, with liability determined by the location of the buyer rather than the location of the sale. Under current federal law, states and localities cannot require out-of-state sellers to collect a sales tax unless the seller has a physical presence (“nexus”) in that jurisdiction, such as a retail branch. In addition, it is often difficult for states to collect sales and use taxes from buyers if the sale transaction occurred in another location. The increasing prevalence of cross-jurisdiction sales as a result of Internet transactions is another reason state and local sales taxes may apply to fewer purchases and become less productive.

In essence, both the issue of taxation of service purchases and the difficulty of taxing

cross-border purchases illustrate how the typical state sales tax structure is outmoded, having been designed for a different time and economy. So, the challenge to states is either to redesign the sales tax or scrap it entirely for a different consumption tax.

- (iv) The dislike of property taxes, even compared with other state-local taxes, has been a recurring theme in state-local finance for a number of years. But recent challenges to the property tax seem to be motivated by different factors rather than traditional concerns and may imply a renewed wave of proposals for reducing or constraining this tax, which has continued to provide nearly 30 percent of local government revenue and 75 percent of local tax revenue. Three factors seem to have been important in driving recent concerns about property taxes and proposals for reductions: (i) uneasiness and uncertainty created by the growth of property taxes, especially related to growth in housing values for homeowners, (ii) concern about the value of fiscally independent local governments as opposed to tax revenue collection or direct provision of services by state governments, and (iii) concern about the distributional impact of property taxes compared with alternative state-local taxes. This seems quite different from the 1980s and 1990s when disparities in property tax wealth and the resulting implications for financing schools were the prime motivators of “reform” efforts.

Recent research reported in Fisher, Bristle, and Prasad (2010) suggests that the rapid growth in property taxes and resulting taxpayer uncertainty, especially for homeowners, has been the major impetus for the most recent wave of proposals to reduce property taxes. It is not clear whether this focus on rising property taxes reflects concern about the uncertainty of property tax bills when taxes change often and substantially, an illusion that homeowners are not wealthier despite large capital gains, uncertainty about the permanence of capital gains, or a perception that homeowners are now bear-

Table 3**Sources of Personal Income (percentage distribution)***

Income source	1960	1980	2000	2009
Wage and salary disbursements	66.3	59.7	57.3	52.3
Employer contributions for employee pension and insurance funds	3.5	8.0	7.2	8.7
Employer contributions for government social insurance	2.3	3.9	4.1	3.8
Personal interest income	6.0	11.9	12.0	10.3
Personal dividend income	3.3	2.8	4.5	4.6
Old-age, survivors, disability, and health insurance benefits	2.7	6.7	7.4	9.6
Family assistance	0.2	0.5	0.2	0.2
Other personal transfer receipts	1.1	3.2	4.2	7.7

NOTE: *Columns do not total 100% due to unreported categories.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis.

ing an “unfair” share of public service costs due to the relative growth of residential property taxes.

- (v) Public finance economists have long noted that pricing of state-local services (that is, financing either construction or use of facilities and services with fees as opposed to taxes) has potential advantages for some services often provided through state and local governments. Prices (fees) can target direct users in proportion to the benefit, assist in measuring the demand for public services, and be used to allocate use during periods of congestion. Such pricing is most common for services that have largely private benefits, such as water, electricity, health care at public hospitals, higher education, recreational facilities, and transportation. Indeed, fees collected for health care and higher education accounted for more than half of state-local charges and fees in 2007.

Two recent trends suggest that the use of pricing (fees) may become more attractive in the future. First, state governments across the nation have decided that public higher education students should pay a larger fraction of the cost of education. For all public institutions, tuition has increased from 23 percent of revenue to 37 percent in the past 13 years. Even with the large increases in

prices, enrollment in public higher education continues to grow. It seems unlikely that this trend will be reversed, and in fact the concept may be applied to other government-provided services. Second, changes in technology have made it easier, less costly, and more efficient to collect fees and tolls for roads, public transit, and other public utilities (think electronic monitoring and meters). I imagine that some of that technology might eventually be applied to other public services as well.

Income Taxation and Senior Citizens

Although many of these issues have been widely discussed and dissected in detail, here I review one—senior citizen taxation—that has not had the same attention but illustrates the combined economic and political aspects of the issues discussed here.

In 1960, wages and salaries of workers accounted for two-thirds of total personal income, whereas Social Security (Old-Age, Survivors, and Disability Insurance [OASDI]) provided less than 3 percent (Table 3). By 2009, wages and salaries had fallen to only 52 percent of personal income and Social Security (OASDI) benefits had risen to nearly 10 percent. Income from interest, dividends, and employee pension and insurance funds also

had grown in relative importance. This changing relative importance of income sources reflects the aging of the U.S. population and the growth of both public and private retirement benefits—facts relevant to states, which historically have provided favorable tax treatment for senior citizens. According to a report by Davis Baer (2007), 26 states and Washington, D.C., exempt Social Security benefits from state income taxation, 23 states exempt private pension benefits (at least partially), and 28 states plus Washington, D.C., provide additional personal tax exemptions for seniors.

Michigan is an extreme example. Menchik (2003) reports that the effective state income tax rate for senior citizens in that state is *negative*—seniors as a group pay no state income tax but receive refunds or credits. Specifically, in Michigan Social Security and public pension benefits are tax exempt, there is a large exemption for private pension benefits, and seniors receive an additional personal exemption, a partial capital income exemption, and a generous and refundable property tax credit administered by the state income tax.

As the demographic trend continues in the next decades and retired individuals comprise a growing fraction of the population, income taxes in states with such tax benefits will be applied to a declining share of income and thus become less productive. So, an obvious philosophical and policy question arises: Should senior citizens pay toward state services? Certainly they continue to benefit directly and indirectly from state services after retirement. Many of the state income tax provisions noted were enacted when a substantial proportion of senior citizens lived near or below the poverty level. But the growth of Social Security, pensions, and other benefits has changed the environment. Today, fewer than 10 percent of senior households live below the poverty line, which is less than any other major population segment. Yet, any official in state government will tell you that senior citizens are also a powerful political force.

Service Provision

For state and local governments, if the main long-term revenue challenge is designing a revenue system for the modern economy, the main long-

term expenditure challenge is improving the “effectiveness” of service provision—that is, finding ways to get the greatest result for the money expended. Four services that top this “bang for the buck” list of issues are reviewed (including the criminal justice system, which is discussed in further detail below). In addition, the structure of state-local government, which is itself becoming a major issue, is also discussed.

- (i) State education policy has shifted from the focus in the 1980s and early 1990s on reducing disparities in school resources to a focus in this decade on considering methods of evaluating and improving educational results. The story is now quite well known. Increased state government financing of K-12 education reduced spending differences among schools and increased real per student spending substantially, which resulted in specialized attention and dramatically smaller class sizes. Yet, educational outcomes measured by a variety of standardized tests or school completion rates have not improved substantially.

Not surprisingly, the state and federal governments reacted. States adopted enhanced graduation requirements (47 states), graduation tests (23 states), school “report cards,” and opportunities for nontraditional teachers and schools (“charter schools”). The federal government’s “No Child Left Behind” law mandates annual evaluation and improvement, with a set of prescribed remedies for schools that are not improving. This has been a dramatic change, with centralized governments assuming increased responsibility for traditionally local issues. With the growing importance of education in the international job market, one expects this push for “improvement” in educational outcomes to continue.

- (ii) Improving the effectiveness of criminal justice systems has become a focus of state governments across the nation. Especially during the 1990s and earlier in this decade, state-local spending on public safety and corrections increased rapidly, in large part

because the number of people in state prisons increased substantially. As incarcerations grew, corrections and public safety occupied an increasingly larger fraction of state budgets amid concern that public safety outcomes have not improved proportionately. As a result, states are now reconsidering criminal justice policy. This issue is considered in greater detail below.

- (iii) Although not exclusively a state-local issue, expanding access to and controlling the costs of health care are exceedingly important for state and local governments. Health care costs affect states both in their role as the primary financial supporter of health care for low-income families (principally through Medicaid) and in their role as a major employer. Medicaid expenditures are approaching 15 percent of total state-local spending, and various estimates of aggregate health-related spending by state and local governments (including Medicaid, public health programs, health care benefits for employees, and the cost of health care for prisoners) suggest a range between 25 and 30 percent of total state-local expenditures. If health care costs continue to increase at relatively fast rates nationally, then these expenditures could easily take an even larger share of state-local budgets.

The recent adoption of new health insurance legislation by the federal government certainly is expected to affect state-local government expenditures, although the nature and magnitude of those effects are not yet clear. Changes in Medicaid rules are expected to increase eligibility in some states, adding to the number of people covered; but on the other hand, requirements for businesses and individuals to purchase health insurance may reduce the number of persons requiring Medicaid assistance. To the extent that provisions in the law intended to reduce the growth rate of health care costs are successful, those reductions will reduce budget pressure for state and local governments. Thus, individual states and localities are in much the same position as private businesses, having

to respond to rising health care costs but not being in a position to alter those national trends independently.

- (iv) Public employees have been a target in the state-local government response to the recession, with widespread reductions in employment and salaries, but concern about public employee pension and benefit plans had arisen even before the recession. Three issues are often discussed. First, most state-local employees continue to be covered by defined-benefit pension programs, even as many private employers have shifted to defined-contribution or 401(k) plans. Second, often public employees are eligible for retirement and receipt of pension benefits at relatively young ages, sometimes after working 25 or so years, even when retirement ages for Social Security and some private pensions are rising. Third, in many cases, state-local employee contracts have required that these workers pay a smaller fraction of health insurance costs than many employees in the private sector.

These differences resulted from a number of factors. Sometimes public employees were paid lower salaries than comparable private sector workers, with the difference offset by more-generous benefits. Sometimes, as also happened in the private sector, employers agreed to generous retirement benefits because those costs were deferred into the future. And in some cases, retirement at relatively young ages was in recognition of the strenuous nature of some jobs, as often cited in the case of public safety workers, for instance. Changing circumstances have called all of these into question. Life expectancy and quality of health have improved substantially, with people now commonly working well into their 60s. Individual retirement savings plans are now the norm. With many past state-local employees now retired, state and localities are bearing the retirement costs that were once considered “deferred.” And states are worried about the implicit debt that the future retirement costs of current employees represents. Thus,

it seems almost certain that all of these aspects of state-local employee contracts will be reexamined in the future.

- (v) Finally, even the basic structure of local government is being reexamined, with two aspects often mentioned. First, with about 89,500 local governments—including counties, municipalities, townships, school districts, and other special districts, some with overlapping responsibilities and boundaries—questions are being raised as to whether some consolidation in this structure would reduce costs or improve accountability to citizens. The more than 14,500 school districts are a second concern. Many school district boundaries were set many years ago and often do not correspond to boundaries of other local governments. And the boundaries established in the past coupled with population change and migration means that school districts vary greatly in both area and number of students. So, it seems likely, especially in some states, that the structure of these local governments may be reconsidered as the pressure for more effective and lower-cost service provision continues.

Criminal Justice Policy

Criminal justice expenditures and policy, especially for corrections, deserves further discussion, partly because this has been an especially fast-growing component of state-local budgets and partly because it raises important issues of social policy as well as fiscal policy. As with taxation of senior citizens, criminal justice policy also illustrates the interaction between economic and political forces.

In 2007, state and local governments spent about \$68 billion on corrections and about \$191 billion on criminal justice services in aggregate. Although spending in this category grew exceptionally fast in the 1980s and 1990s, with average annual growth of about 10 percent, spending is still a relatively low fraction of state and local budgets. Criminal justice expenditures in aggregate (including police, courts, and prisons) are about 7 percent of state-local expenditures, and corrections spend-

ing alone is less than 3 percent. However, because of this category's rapid spending growth, its share of state-local budgets has doubled since the early 1980s.

Despite the increased spending and the implications for states' fiscal conditions, it seems to me that the key issues here are ones of efficiency and social policy. The United States has the highest incarceration rate in the world, with 1.6 million persons incarcerated in federal and state prisons in 2008, or 504 per 100,000 people. Incarceration rates doubled in the 1980s, increased by 60 percent in the 1990s, but have increased only 5 percent since 2000. And the incarceration rate actually *decreased* in 2008 for the first time in many years, suggesting that states have begun to make policy adjustments. The efficiency of criminal justice policy based on jail time can be questioned partly because recidivism remains high. After release, many former prisoners violate release conditions or commit other crimes and return to prison. And crime rates had declined nationally even while incarceration rates continued to increase substantially.

The criminal justice policy followed by the state and local governments in the 1980s and 1990s not only led to a high rate of incarceration but also had disproportionate effects among the population. In 2008, 58 percent of federal and state prisoners were black or Hispanic, with 35 percent being black males; both rates far exceed the ratio of those minority groups in the population. Indeed, the incarceration rate for black males (3,161 per 100,000) is six times greater than that for the total population.

A general equilibrium perspective is helpful, I believe, in interpreting these disproportionate effects of criminal justice policy. Policy decisions concerning illegal drugs substantially contributed to increased incarceration rates. Indeed, 53 percent of prisoners in federal prisons and 20 percent of state prisoners were sentenced for drug-related offenses, some involving supply and some use. Involvement with illegal drugs may be related to the success or failure of our public education system, also a service provided through state and local government. High school completion rates in many large urban school districts remain low, possibly contributing to the drug business and subsequently

to prison populations. Finally, a disturbing statistic is that about half of the prisoners in state and federal prisons are parents of minor children (Loury, 2007). So, high incarceration rates contribute to the number of single-parent households, which is the group with the greatest concentration of poverty in the United States today and a substantial component of those whose health care is financed through Medicaid. Therefore, one important aspect of state-local budgets—corrections costs—is influenced by another important state-local service (education) and influences the fastest-growing component of state spending (Medicaid).

SUMMARY OF THE STATE-LOCAL “STATE”

State and local governments in aggregate represent about one-seventh of the U.S. economy, with education and welfare (mostly Medicaid) accounting for more than half. For the past 20 years, the state-local sector has been stable in relative size, with spending varying only between 21 and 24 percent of personal income. These governments rely on five roughly balanced revenue sources— income, property, and sales taxes and federal grants, with a growing role for pricing of services through fees and charges. State and local governments currently find themselves under stress from both the recession and long-term economic and demographic changes. So, they are faced with a set of challenging questions. Where will future revenue come from? How can they provide services more effectively? What structural changes are warranted?

Given the magnitude of the challenges, it seems likely that this transition decade will lead to a period of major change. In the short run, taxes may be increased to restore fiscal stability as the economy recovers. Of course, tax increases alone will not be enough. Several options have been widely discussed, including redesigning corrections systems, reconsidering public employee pension and benefit plans, broadening tax bases, building more substantial fiscal reserves (often called rainy day funds), and even reorganizing local government structure.

To minimize fiscal problems in the future, state and local governments seem likely to be forced to consider a number of long-term structural changes. Most important, it seems there is little support for relative growth of spending (that is, spending that rises faster than income or population), but changing demands and costs likely will result in a different mix of services produced differently than currently. It is not difficult to forecast a continued focus on improving K-12 outcomes and access to health care while simultaneously controlling health care costs. These two large programmatic areas dominate state-local budgets, so fiscal stability and service efficiency seem impossible without addressing these concerns.

In terms of revenue, discussion certainly will continue about broadening tax bases to make the main state government taxes (income and sales) more relevant to the modern economy. Whether the appropriate policy changes will be implemented seems more problematical, as those changes face substantial political challenges. There are interesting parallels between reforming and modernizing income and sales taxes at the state government level and reforming and modernizing Social Security at the federal government level. Everyone seems to think it is necessary, but implementation is another matter. And if these difficult political decisions are not made, then the fiscal problems of the relevant governments certainly seem likely to worsen. Finally, given the continuing aversion to taxes and the growing use of digital technology, increased interest in charging for services provided through state and local governments seems likely.

Although many fiscal changes seem probable for the state-local government sector of our economy, one fundamental fact seems unlikely to change: State and local governments will continue to be central in the lives of most citizens through the public services they provide—schools and universities; roads, parking, public transit, and airports; health care and public hospitals; police and fire protection; courts and state prisons; water and sanitation; waste collection and disposal; parks and recreation opportunities; income support for low-income families; and environmental protection—essential services for everyday living.

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Fisher

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State Tax Revenue Growth and Volatility

Gary C. Cornia and Ray D. Nelson

Macroeconomic conditions and tax structures jointly determine the growth and volatility of state tax revenues. Since a variety of economic conditions exist among states, government policymakers should carefully anticipate and consider the possible impacts of proposed tax reform and revenue enhancements on the long-term growth and volatility of their unique tax revenue portfolios. In the short run, states generally cannot alter the volatility and growth rates of their economies. They can, however, change the composition of their tax portfolios to minimize the effects of the business cycle on their fiscal health. For this reason, state officials need to consider the natural tendencies of their economies when formulating tax policy. For example, states with volatile economies might want tax portfolios that minimize the impact of national macroeconomic trends; those with stable economies might consider adopting more aggressive tax portfolios that optimize their tax revenue growth/volatility combinations. (JEL H21, H72, R51)

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In recent years, state legislators and governors faced difficult budget deliberations caused by revenue shortfalls. News reports repeatedly identify and chronicle the dire fiscal conditions faced by most states. Dadayan and Boyd (2009) report record drops in tax revenues and describe historically difficult budgeting conditions. Unfortunately, if the patterns continue, states will yet face severe budgeting challenges beyond the official end of the national recession. These challenges will be especially acute if a sluggish labor market recovery and renewed banking sector stress persistently retard sales and income tax receipts.

Gamage (forthcoming) identifies a recurrent pattern of state fiscal crises. He describes how states often broaden tax bases or raise tax rates during recessions to maintain commitments made during prosperous periods. When the economy begins to recover, states experience budgetary relief as tax revenues grow. Eventually, the higher rates and

broader bases generate significant increases in tax revenues and often lead to new or broader financial commitments. However, when the economy lapses into recessionary conditions, these commitments inevitably contribute to higher levels of budgetary stress. The resulting budget deficits once again challenge state officials to find new revenue sources and cut expenditures.

Sobel and Wagner (2003) suggest that, when changing the tax code to generate additional revenue, government officials and public policymakers should consider the implications of such revisions on the long-run expected growth and volatility of tax revenues. Highly volatile taxes or taxes with high income elasticities are useful when trying to balance a budget but create substantial challenges when the economy contracts. What increases rapidly during an economic expansion also falls precipitously during an economic contraction. The resulting challenge of revenue shortfalls during a downturn is especially acute in the current eco-

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economic and political environment. Although economic discussions of taxes almost always include consideration of the important principles of equity, efficiency, and economic development, the goal of balancing budgets currently trumps almost every other policy dimension.

Two main factors affect the growth and volatility of state tax revenue receipts over the business cycle. First, the uniqueness of each state's economy ultimately affects its growth and volatility. Second, a state's choice of taxes, tax base, and tax rates can alter the revenue growth and volatility inherent in its economy. Because macroeconomic conditions vary so widely among states, subnational government officials must wisely consider the growth and volatility of their unique tax portfolio to minimize future fiscal challenges.

Legislative and executive tax policy can benefit from answers to the following research questions:

- (i) How can state economic growth and volatility be accurately measured and consistently compared?
- (ii) How do alternative revenue sources contribute to the growth and volatility of revenues generated by state tax portfolios?
- (iii) How do state economies and tax portfolios interact to determine tax revenue growth and volatility?

The paper proceeds as follows. Analysis of the three questions first considers patterns in the U.S. business cycle and subsequently focuses on the variety of economic conditions experienced by individual states. Examination of the growth and volatility of individual tax sources, especially sales, income, and property taxes, suggests their potentially differing effects on revenue growth and stability. Inquiries into tax volatility are guided by building on the literature initiated by Groves and Kahn (1952). Two illustrations then demonstrate how knowledge of tax revenue growth and volatility can be incorporated into budgeting decisions and public policy. Because the growth and volatility of tax receipts likely depend on economic conditions and tax policy, the analysis of historical patterns helps identify best practices among states. Such analysis can potentially help decisionmakers know which growth and volatility characteristics have

helped states weather the current fiscal storm. Finally, the analysis here makes practical recommendations based on a summary of empirical findings and research conclusions.

This article uses simple graphical constructs to summarize extensive data resources. Hopefully, this approach will foster insights that government officials and budget analysts might find useful in their tax reform and budget balancing efforts. Of course, more sophisticated statistical models are possible and appropriate for future work. The simplicity of the graphical tools and data exploration philosophy pioneered by Tukey (1977) and refined by Tufte (2001), however, increases the probability that policymakers and their respective professional staffs will use the findings of the present research effort. In the past, similar graphical communication has proven very successful and influential in helping executive and legislative branch officials understand empirical findings critical for tax policy.

HISTORICAL BACKGROUND

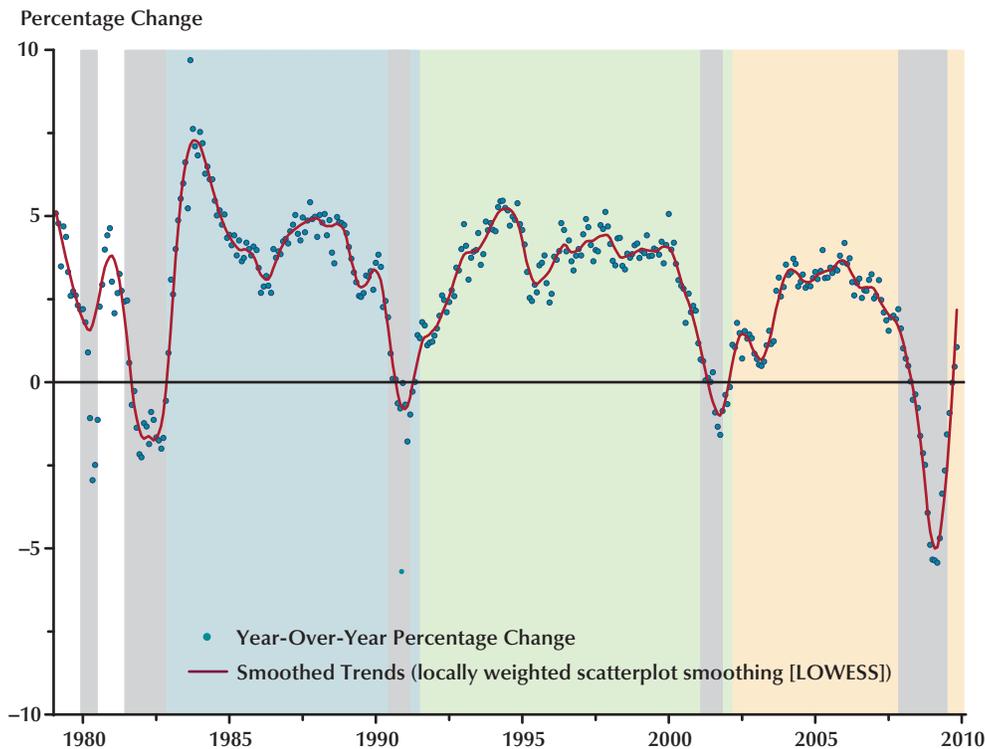
Holcombe and Sobel (1997) and Crain (2003) emphasize the importance of including the expected growth rates and volatility of revenues and expenditures whenever conducting fiscal analysis. Their comments suggest that the first step in understanding revenue growth and volatility is to consider the macroeconomic background that generates the revenue streams.

Recent Macroeconomic Patterns

Researchers commonly focus on the National Bureau of Economic Research (NBER) Business Cycle Dating Committee's declarations when studying business cycles. NBER leading, coincident, and lagging indicators establish the beginning, end, and duration of national expansions and recessions. The NBER cycle analysis works well at the national level. However, because state business cycles do not synchronize perfectly with national patterns, state-level measures are needed to make interstate business cycle comparisons. Fortunately, the Federal Reserve Bank of Philadelphia publishes monthly coincident indexes that measure each state's economic activity in a consistent fashion.

Figure 1

The U.S. Business Cycle and Year-Over-Year Growth Rate of the National Coincident Index (1979-2009)



SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes.

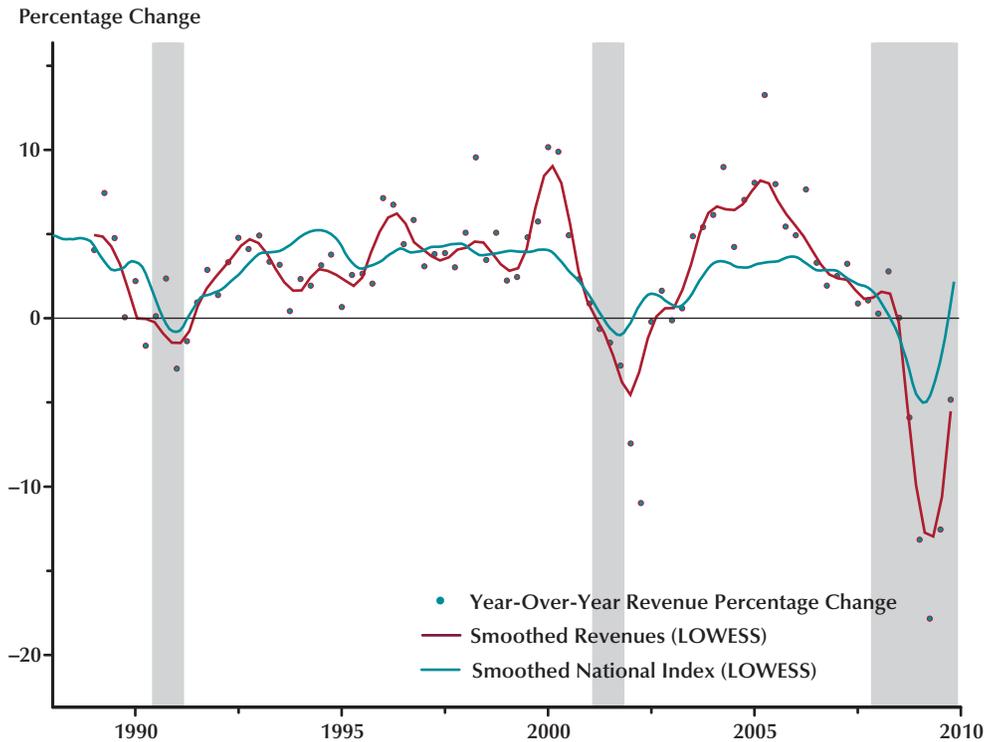
The Philadelphia indexes provide insightful indicators for anticipating state tax revenues. The methodology implemented by the Philadelphia Fed builds on the pioneering work of Stock and Watson (1989). Crone and Clayton-Matthews (2005) adapt this methodology to state-level data. They collapse (i) nonfarm payroll employment, (ii) average hours worked in manufacturing, (iii) the unemployment rate, and (iv) real wage and salary disbursements into a single index by using a dynamic single-factor model. The method uses a Kalman filter to extract a major component from each of these four different time series. With this approach the trend for each state's index is set to the trend of its gross state product. With careful implementation, the long-term growth in a state's

index closely tracks the state's overall business-cycle patterns. Because the model and the input variables are consistent across all 50 states, the resulting state indexes are comparable.

The Philadelphia Fed also constructs a national coincident index that provides growth and volatility data for the U.S. economy—a useful starting point for evaluating the potential influences on total state receipts. Figure 1 shows the year-over-year growth rate in the national coincident index. The five recessions shown vary significantly in their severity and duration. According to NBER business cycle dating protocol, a very brief and mild recession began in July 1990 and ended in March 1991. Once a vigorous expansion began, the economy accelerated into the longest post-World War II expansion on record.

Figure 2

Total State Tax Revenues Over the Business Cycle: Year-Over-Year Growth Rates (1989-2009)



SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes and Census Bureau Quarterly State and Local Government Tax Revenue.

Similarly, another brief and mild recession began during March 2001 and officially ended in November 2001. In contrast to the previous business cycle, the economy did not recover rapidly after that recession. The figure, which reflects the large emphasis on labor market conditions in the Philadelphia Fed index, show that a jobless recovery continued almost two years after the recession officially ended.

The present recession that according to the NBER began in December 2007 is noteworthy because of its depth and length. The national coincident index did not fall below the previous year's level until a few months after that start date. The depth of the fall is the worst since the Great Depression. Because of the prominent weighting of labor markets in the index, it reflects the millions

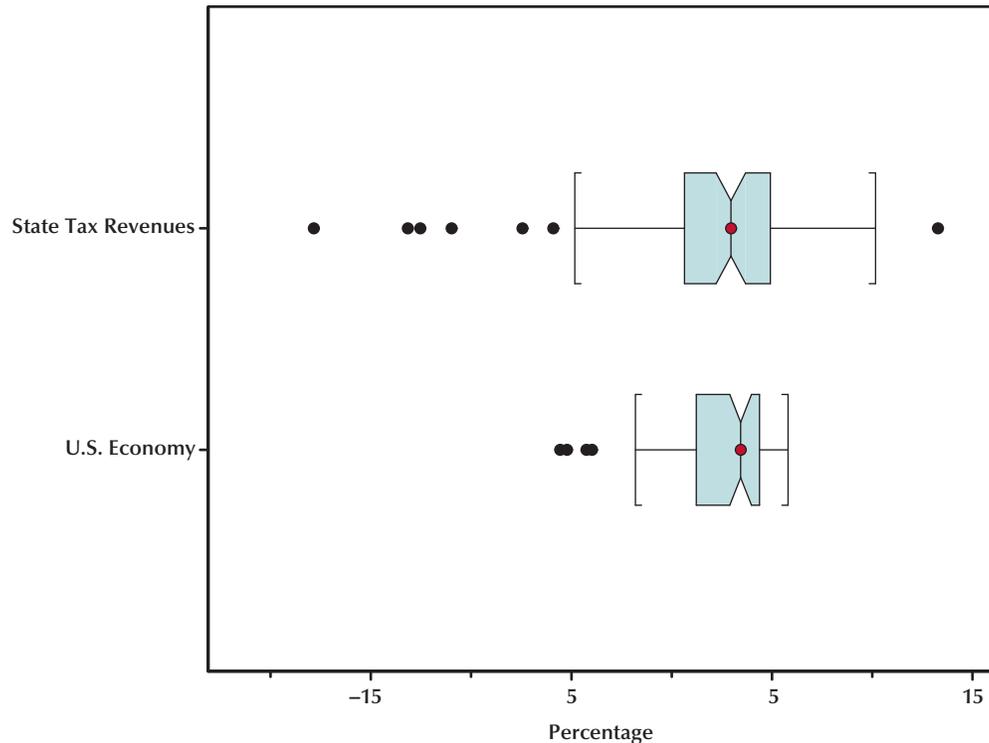
of jobs lost since the beginning of the recession. The depth of the decline makes some economists pessimistic about the time it will take for labor markets to return to employment levels achieved during the previous expansion.

State Tax Revenues and the Business Cycle

Total state tax revenues as estimated by the Census Bureau show the current fiscal dilemma faced by many states. Figure 2 demonstrates how total state tax revenues vary over the business cycle. The blue line corresponds to the rate of change in the year-over-year national coincident index shown in Figure 1. Adjusting each tax revenue time series by the Personal Consumption Expenditure Index gives real rates that are comparable to the

Figure 3

State Tax Revenues versus the U.S. Economy: Year-Over-Year Growth Rates in Quarterly Observations (1989-2009)



SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes and Census Bureau Quarterly State and Local Government Tax Revenue.

real national coincident index growth rates. Interestingly, state tax revenues, shown in red, declined more rapidly than the U.S. economy (as depicted by the national coincident index) in each business cycle. In the recession that began in 1991, neither the magnitude nor duration of declines in revenues were significant enough to cause severe budgeting challenges. As would be expected, revenues increased over the entire record-long expansion of the Clinton administration, at times at a rate well in excess of that for the U.S. economy. However, during three different periods, revenues declined at a rate greater than that for the U.S. economy.

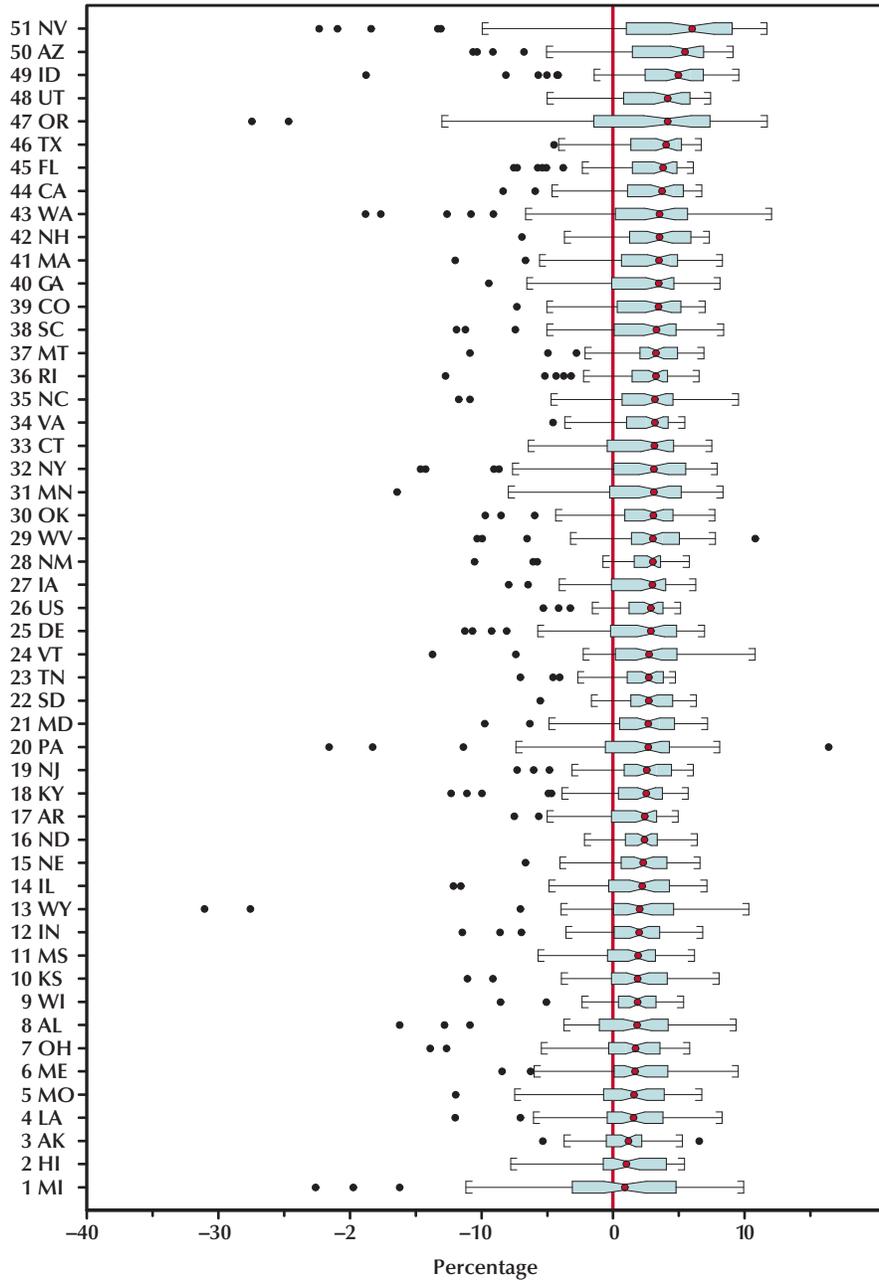
In the recovery from the 2001 recession, the U.S. economy grew slowly and the labor market strug-

gled to improve. This jobless recovery undoubtedly translated into the slow growth in state tax revenues. Eventually, tax receipts accelerated rapidly and even exceeded growth in the U.S. economy substantially until partway through the next recession. During one quarter, the year-over-year growth rate for total state tax revenues exceeded 15 percent. During the most recent recession, state tax revenues decreased dramatically relative to the U.S. economy, which corresponds to the unprecedented, record-breaking decline mentioned by Dadayan and Boyd (2009).

The box plots in Figure 3 facilitate comparison of the distributions of the changes in state tax revenues and the U.S. economy. These plots succinctly summarize the location and spread of each distri-

Figure 4A

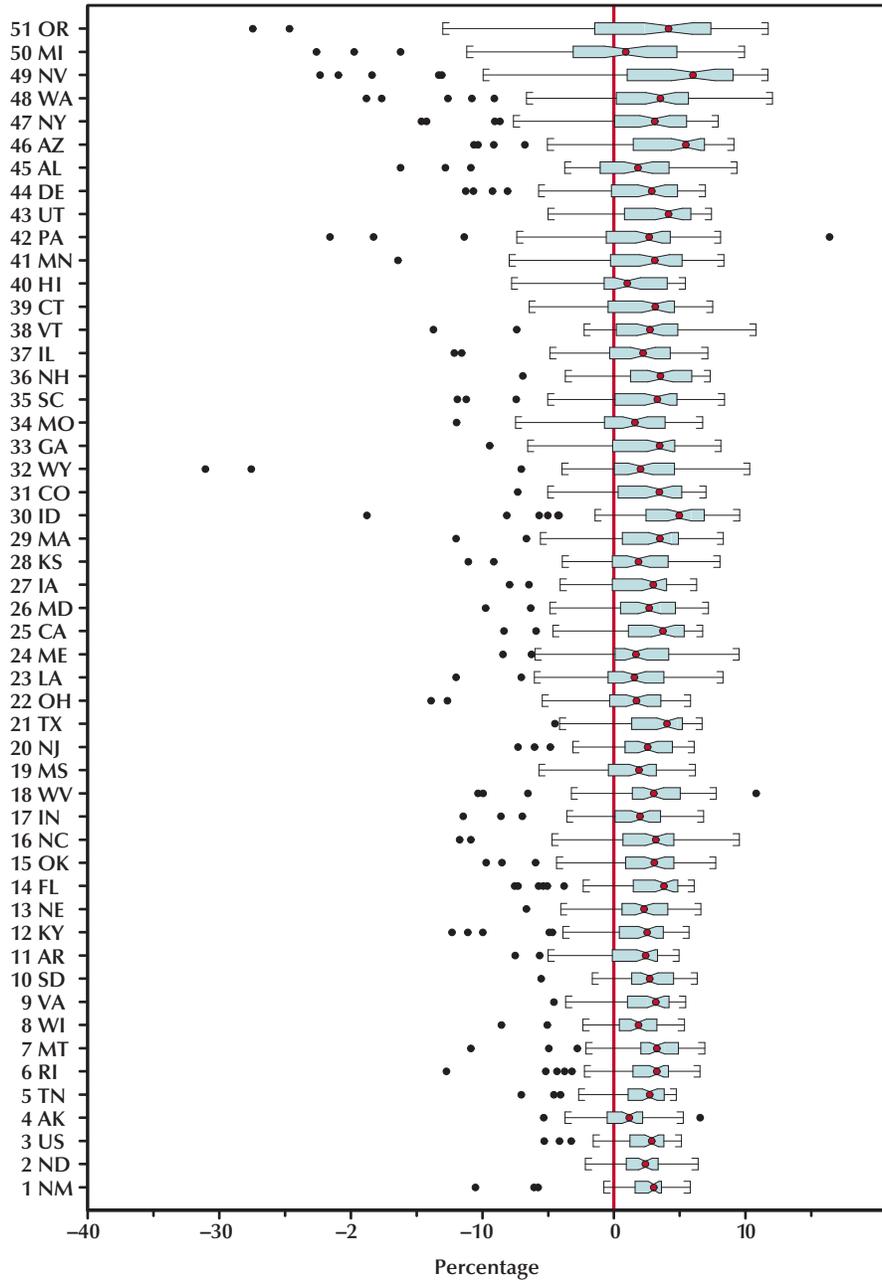
State Economies: Year-Over-Year Growth Rates in Monthly Coincident Indexes Ranked by Median of Percentage Change (1995-2009)



SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes.

Figure 4B

State Economies: Year-Over-Year Growth Rates in Monthly Coincident Indexes Ranked by Interquartile Range of Percentage Change (1995-2009)



SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes.

bution by using first, second, and third quartiles. The median of the distributions is depicted by the dot in the middle of the notched box. The length of the box depicts the interquartile range (IQR), the difference between the third and first quartiles, and is one measure of the distributions' spread. Put another way, the middle 50 percent of observations lie in the range encompassed by the box. The whiskers give another measure of the spread and bracket all observations within $1.5 * \text{IQR}$ distance from the sides, or hinges, of the box. In the revenue box plot, the large and small observations outside the whisker boundaries are classified as outliers and correspond to quarters when revenue either fell precipitously or grew rapidly.

Figures 2 and 3 support the conclusion that the average rates of change in state tax revenues and the U.S. economy are equal but more volatile for revenues. First, in Figure 3, the middle (median) of the box plot for revenues is slightly less than that for the economy. Second, half of the increases in revenue exceed the largest increase in the economy. This means that the size of state governments increased relative to the U.S. economy during the period 1994-2009. The box plots also suggest that growth of revenues is more volatile and negatively skewed than growth of the economy. Both the width of the IQR and the length of the whiskers show that revenues have a bigger spread than the economy. Although revenues and the economy both have extreme increases and decreases as indicated by the outliers, the negative skewness conclusion for revenues follows because the number of extreme declines in revenues exceeds that for the economy. The fact that measures of state tax revenue growth and volatility both exceed similar measures for the U.S. economy suggests that state budgets are very exposed and susceptible to potential economic downturns.

Individual State Growth and Volatility During the National Business Cycle

To make budgeting and policy recommendations for individual states, it is important to question whether national patterns generalize to individual states. Another interesting investigation explores the possible trade-off between growth and volatility (Groves and Kahn, 1952). Previous work by

Crain (2003) investigates whether the expected return and risk trade-off found in financial markets similarly applies to the relationship between a state's economic growth and volatility and its tax revenues.

The box plots in Figures 4A and 4B lead to relevant observations about the growth and volatility of individual state economies. The plots depict the distribution of year-over-year percentage changes in the Philadelphia coincident index for each individual state and for the U.S. economy. The two plots differ only in their criterion for ranking. Figure 4A is ranked by the median growth rate of the coincident index for each state.

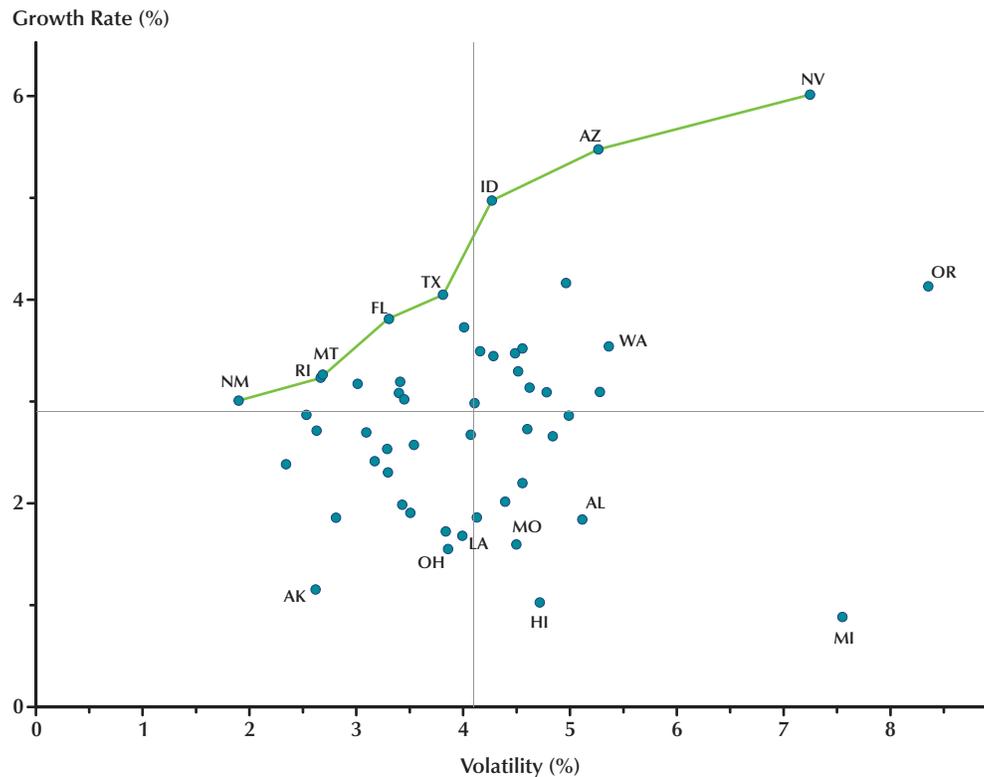
As would be expected, in Figure 4A the United States ranks in the middle (26th) simply because it is the weighted average of all states. Because of the number of extreme negative observations during the current recession, all of the means tend to pull toward the left side of the box and whisker diagram. This is consistent with a negatively skewed distribution for the rates of change. The number of negative outliers shows that all states suffered at least some extreme declines in their economies during the period 1995-2009.

The box plots in Figure 4B focus on volatility rather than growth. Figure 4B presents the same information as in Figure 4A, except each state is now ranked by the IQR rather than the median. Figure 4B identifies Oregon, Michigan, Nevada, Washington, and New York as having volatile economies. As expected, the United States, a portfolio of all states, has low volatility. New Mexico, North Dakota, Alaska, Tennessee, and Rhode Island also have relatively stable economies. Michigan is especially noteworthy because it has a negative average growth rate. Three large negative quarters for Michigan pull the mean significantly down from the median. It is also interesting that its spread shown by its IQR and the length of the whiskers imply that the Michigan economy is also very volatile. Michigan does not have the benefit of a high growth rate to compensate for its high volatility. This contrasts with the high-growth and high-volatility combinations evident for Oregon, Washington, and Nevada.

Despite the attention California receives in the popular press, its economy does not exhibit extreme

Figure 5

The Growth-and-Volatility Efficiency Frontier for State Economies: Year-Over-Year Percentage Change in Monthly Coincident Indexes (1995-2009)



SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes.

volatility, even though it does have a very high growth rate. As expected because of their geographical proximity, Washington and Oregon seem to exhibit similar characteristics. Two states that heavily depend on energy extraction, Wyoming and Alaska, have low growth rates. Alaska, however, does not endure the same extreme variability in economic growth that Wyoming does. Texas distinguishes itself with its desirable combination of high growth and low volatility.

The Efficiency Frontier for State Economies

Figure 5 shows growth and volatility of state economies combined into a single scatter plot. This graph is very similar to that often derived in finance

to analyze the efficiency frontier for security markets. The corresponding measurements from the finance discipline are expected return and volatility. Figure 5, using the same data used for Figures 4A and 4B, plots the median return and IQR for each state. It is preferable to have high growth with low volatility. The reference lines that divide the graph into growth/volatility quadrants are based on the median growth rate and median standard deviation. States on the efficiency frontier, those with the best growth and volatility combinations, dominate the states below them (those with lower growth) and to the right of them (those with higher volatility).

The following states distinguish themselves by having economies on the efficiency frontier: New Mexico, Rhode Island, Montana, Florida,

Texas, Idaho, Arizona, and Nevada. States that seem to have inferior combinations of low growth and high volatility are Michigan, Alabama, Hawaii, and Missouri. Alaska, Ohio, and Louisiana fit into the low-growth/low-volatility quadrant. Some states that have widely reported and especially acute fiscal challenges—California for example—surprisingly have relatively stable economies and moderate growth rates.

DIVERSITY AMONG STATE TAX PORTFOLIOS

The second determinant of state tax revenue growth and volatility comes from the characteristics of individual taxes. Each state selects its own set of revenue sources, which it combines into its tax portfolio. In addition, each state chooses its tax base and corresponding tax rates.

The Constitution of the United States allows substantial freedom for states to adopt different tax schemes. The variety of adopted tax policies reflects a wide spectrum of political preferences among state populations. The state of Oregon, for example, has resisted adopting a retail sales tax. This contrasts with a neighboring state, Washington, which has a retail sales tax but no income tax. Even among the 44 states that have a retail sales tax, its implementation is far from uniform. Retail sales tax rates range from below 4 percent to double digits. Sales tax bases also show similar variety. About 75 percent of states exempt food purchases from the retail sales tax. The desire to mediate the regressive nature of the retail sales tax motivates this exemption. In many cases, however, the food exemption eventually leads to higher rates on the remaining taxed goods. In most states, the retail sales tax base includes very few services; however, some states tax many services.

State individual income tax has a similar pattern of heterogeneity. A few states do not impose any such income tax. Those states with an individual income tax choose a variety of tax rates and bases. In general, most states start with the federal income tax as the base but adopt different levels of exemptions and deductions. Marginal tax rates range from under 5 percent to over 10 percent.

Some states have income brackets taxed at different rates, whereas others apply one rate to all taxable income. These differences in tax bases and rates cause state tax revenues to respond in a variety of ways to macroeconomic changes.

A standard theme in state tax design is to keep tax bases as broad as possible while keeping tax rates as low as possible. Many believe that broad bases and low rates generate less revenue growth during economic upswings but also result in smaller revenue shortfalls during economic downturns.

Although state tax portfolios vary significantly, most states rely on some combination of sales, individual income, and property taxes. Because property taxes primarily finance local governments, meaningful consideration of this potential revenue source requires expanding the tax revenue definition to include all state and local taxes. Otherwise, the resulting analysis would give a distorted view of the property tax.

Growth and Volatility of Individual State Taxes

As mentioned, business cycle phases cause state governments to regularly alter their tax structure. Frequent and substantial changes to tax codes influence the growth rate and volatility of tax sources. Although calculating growth and volatility estimates based on a uniform tax policy would yield accurate and informative results, such ideal data unfortunately do not exist. It is true that one might try collecting fiscal note analyses for individual states to adjust for their tax rate and base changes. Such an approach, however, suffers from accuracy and feasibility concerns. The inherent inaccuracy of fiscal note estimates can itself potentially bias growth and volatility estimates. Even if fiscal notes were totally accurate, however, the diversity of state analytical procedures would likely make the task of collecting such data impractical.

For this reason, when interpreting and comparing growth and volatility estimates for various taxes, it is important to remember that (i) the growth rates and risk of each tax depend on the inherent characteristics of the tax category and (ii) the estimates also include the propensity of government officials to alter the tax structure. As shown subsequently, major and frequent changes to the tobacco

tax base and rate significantly influence the mean and standard deviation of tax revenues. For this reason, it is important to use resistant statistics (such as medians and IQRs, as used here) to describe the historical distribution of rates of change. These statistics can effectively exclude extreme rate and base changes from the estimation process.

With the aforementioned caveats in mind, first consider possible differences in the growth and volatility of individual taxes as measured by traditional location and scale measures. The box plot in Figure 6A depicts the distribution of year-over-year changes in quarterly observations in the major tax categories reported by the Census Bureau. The categories in the box plot are ranked according to the median percentage change in total revenue. Taxes on alcoholic beverages and motor fuels have low growth rates. These two taxes are also very stable and provide states and local governments with a steady revenue source. Unfortunately, these taxes represent a very small portion of most states' general revenues.

Motor license taxes include vehicles and drivers. As shown in Figures 6A and 6B, this category has the third-lowest growth rate among the 10 revenue categories. Measuring the volatility as a standard deviation unfairly labels this tax revenue source as relatively more volatile. The box and whiskers, based on the resistant IQR statistics, indicate much less volatility. Three extremely large outliers shown in Figures 6A and 6B unduly influence the estimated standard deviation. A combination of population growth and licensing fee increases likely explains the extreme increases in revenue. Less explainable is the one quarter of significant decline.

The corporate income tax is especially problematic in state budgeting because of its high volatility. Interestingly, its high volatility is not associated with a high growth rate. From a similar point of view used to analyze financial markets, this is a high-risk revenue source without compensation provided by higher expected growth.

The "All Other" tax category exhibits high positive skewness. This probably results from attempts by legislative and executive branches to search for "low-hanging fruit" to augment tax revenues and help balance budgets during economic downturns.

As mentioned, the retail sales and gross receipts tax is a very significant revenue source for state and local governments. As shown in Figures 6A and 6B, it grows moderately relative to other tax revenues and is also reasonably stable. It does have a couple of very negative growth quarters. The mean for this category is probably influenced by a series of three quarters of significantly large declines. In some states, the sales tax generates over 50 percent of state revenues. In most states, however, the sales tax is less than 40 percent of total state revenues.

It is difficult to characterize how tobacco taxes respond to the growth and volatility of the business cycle because the tax rate on these products has increased so rapidly during the period covered by these data. Tobacco taxes show extreme positive growth rates. This surely reflects significant increases in tax rates applied to tobacco products. For this reason, the median and IQR rather than the mean and standard deviation much better summarize the growth and volatility of tobacco tax revenues.

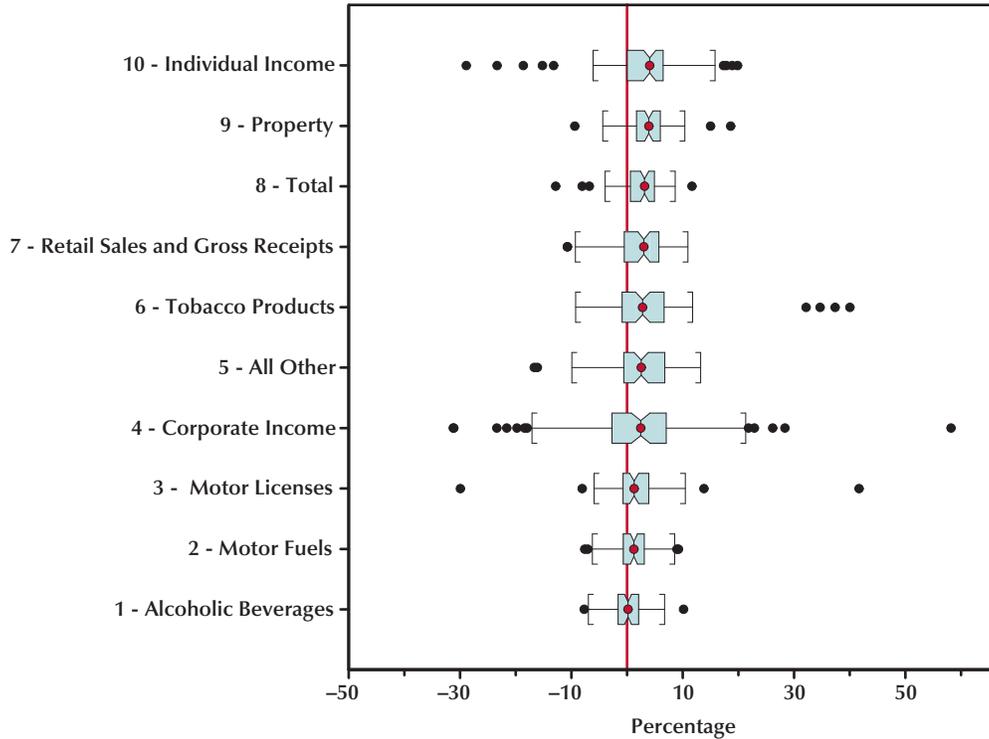
As mentioned, individual income taxes also constitute a very important source of revenue for state and local governments. Their growth rate exceeds that of the retail sales and gross receipts taxes. It is also much more volatile. This volatility is undoubtedly the source of many of the current budgeting challenges faced by state and local governments. Notice the large number of outliers, which correspond to negative rates of growth during the current recession. The significant number of positive deviations possibly encouraged state and local governments to increase their government expenditures and base budgets.

The property tax is mainly used to finance local government. Its combination of high growth and low volatility make it a very attractive revenue source. Its high growth rate is undoubtedly related to the real estate bubble that existed during the early part of this century. If real estate prices continue to decline, however, the growth rate of the property tax could decline commensurately.

Consider now the diversification potential for states of including multiple revenue sources within their tax portfolio. Combining the nine tax categories in Figures 6A and 6B gives a portfolio with

Figure 6A

State and Local Taxes: Year-Over-Year Growth Rates in Quarterly Revenues Ranked by Median of Percentage Change (1989-2009)



SOURCE: Census Bureau Quarterly State and Local Government Tax Revenue.

the eighth-largest growth rate and third-smallest volatility, respectively. This seems to indicate that states with a combination of taxes would tend to decrease the volatility of tax revenues without sacrificing expected growth. This result is consistent with the principles used to achieve diversification in financial market portfolios.

The Efficiency Frontier for Individual State Taxes

Figure 7 plots the growth and volatility measures for each tax category based on the median growth rate and IQR for each category. Once again, the combination of low volatility and high growth is superior. Alcoholic beverages, motor fuels, property, and individual income exhibit this com-

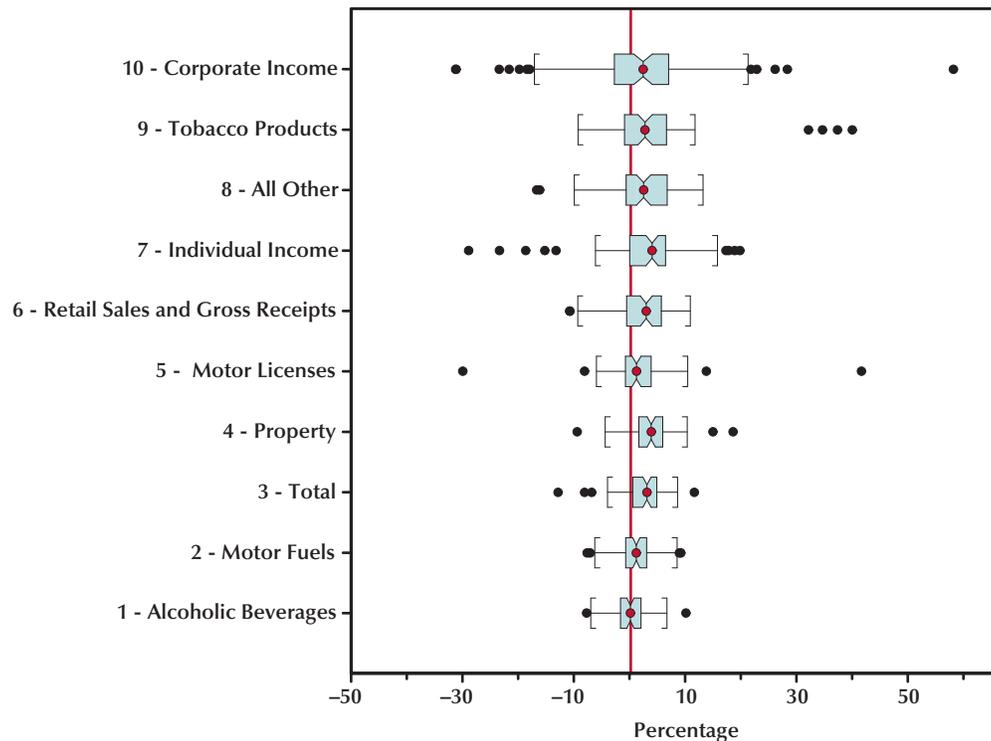
ination and all lie on the efficiency frontier. Interestingly, the portfolio of total taxes would also lie on the efficiency frontier. Individual income tax, as mentioned, has both high growth and high volatility. This contrasts with the retail sales and gross receipts taxes, which have relatively lower growth and volatility. The inferiority of the combination of low growth and high volatility for the corporate income tax is apparent by the tax’s far placement from the efficiency frontier.

State Tax Portfolios

Figure 8 documents the diversity among state tax portfolios. Based on the fiscal 2008 total tax receipts as reported by the Census Bureau, the figure shows proportions of revenue derived from each potential tax resource.

Figure 6B

State and Local Taxes: Year-Over-Year Growth Rates Ranked by IQR of Percentage Change (1989-2009)



SOURCE: Census Bureau Quarterly State and Local Government Tax Revenue.

This figure highlights the importance of sales and income taxes at the state level, which individually or together are significant components in all state tax portfolios. Several states derive a substantial amount of revenue from the “All Other” category, including the energy-extraction states of Alaska and Wyoming, as well as North Dakota, Delaware, Montana, and New Hampshire.

The ranking in Figure 8 is based on each state’s Herfindahl-Hirschman Index, which is calculated as

$$H = \sum_{i=1}^N s_i^2,$$

where s_i is the revenue share of the i th tax. New Hampshire, Montana, Vermont, and Delaware have balanced portfolios. Alaska, Florida, South Dakota, Nevada, Washington, Texas, Tennessee, Hawaii,

and Oregon are largely dependent on a single tax source and do not have diversified tax portfolios.

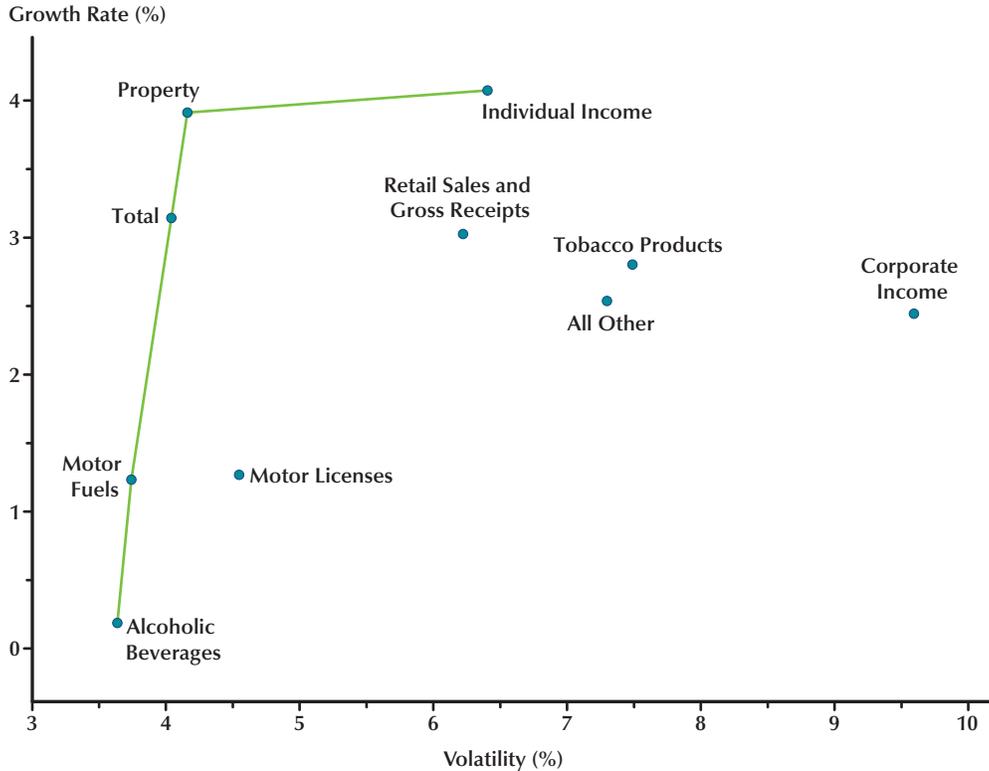
GROWTH AND VOLATILITY PATTERNS OF STATE TAX REVENUES

Thus far the empirical investigation reveals a variety of state economic reactions to different phases of the business cycle. As discovered, unique characteristics of each state’s economy strongly influence the observed historical growth and volatility combinations. Likewise, different types of taxes exhibit distinctive combinations of growth and volatility.

Although each state has limited influence over the economic structure that determines its reaction

Figure 7

The Growth-and-Volatility Efficiency Frontier for State Tax Revenues: Year-Over-Year Percentage Change in Quarterly Revenues (1988-2009)



SOURCE: Census Bureau Quarterly State and Local Government Tax Revenue.

to the business cycle, it can choose the components that it includes in its tax portfolio. Volatility can also be influenced by changes in the tax structure that alter either the tax rate or base. The discussion now turns to how each state’s economy, together with its tax portfolio, has affected its historical state revenue growth and volatility combinations.

Growth Rates and Volatility

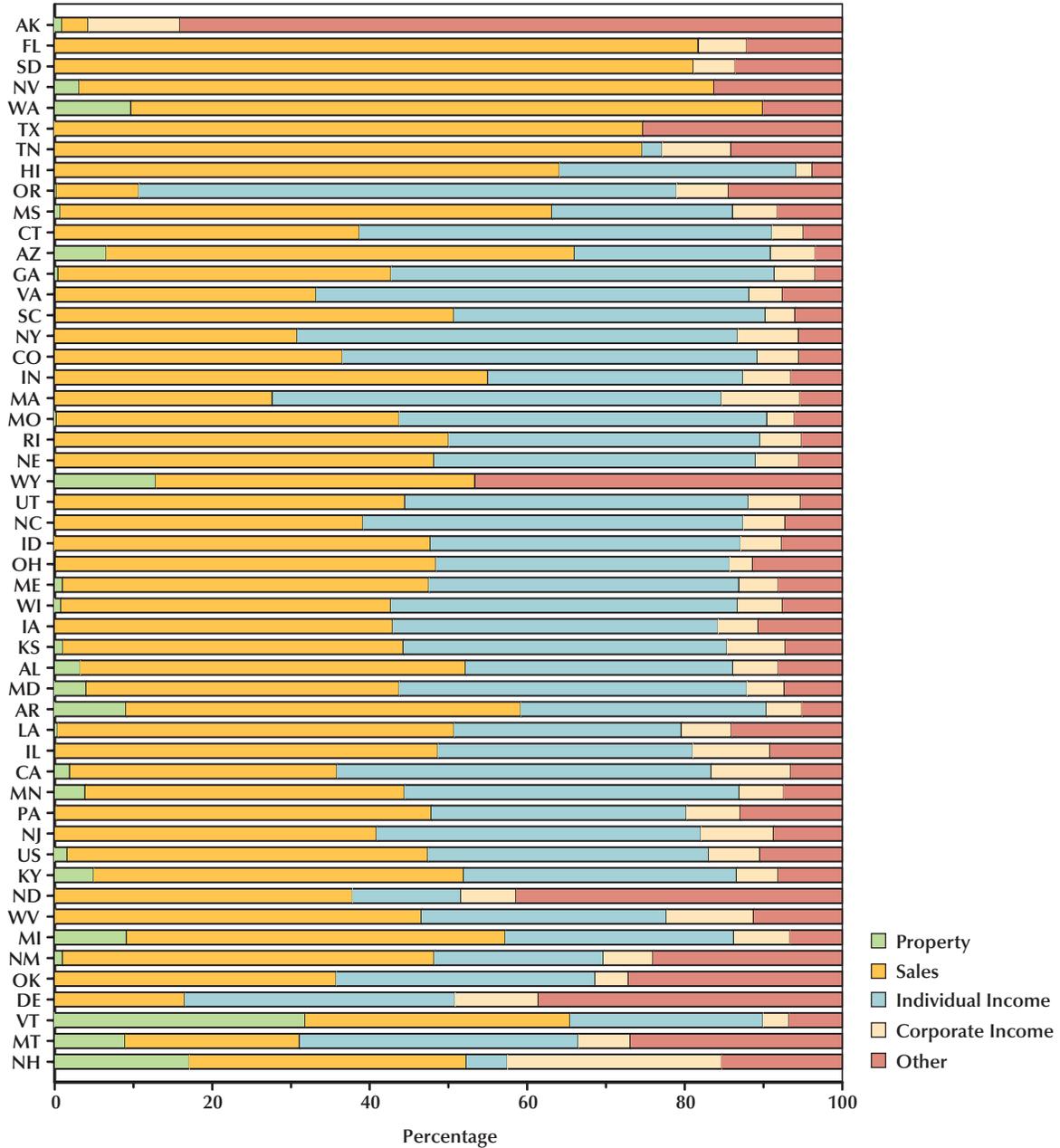
The distributions of year-over-year changes in real revenues for each state are summarized in the box plots in Figure 9. Similar to other figures, Figure 9A is ranked by median growth rates and Figure 9B by IQRs. Before considering individual states, note the large number of positive and nega-

tive outliers in Figures 9A and 9B compared with those in Figures 4A and 4B. Whereas economic growth rates in Figures 4A and 4B are dominated by negative outliers from the large recent economic declines, tax revenue growth rates in Figures 9A and 9B achieve more balanced, symmetrical combinations of extreme positive and negative values. Observe, however, the dominance of Alaska in determining the scale of Figures 9A and 9B.

The box plots in Figure 9A show that many of the high-growth states are located in the western region of the United States. It also appears that two energy-intensive states, North Dakota and Wyoming, achieve significantly large growth rates. The contrast between Oregon and Washington revenues is noteworthy. Washington is a low-growth state and

Figure 8

State Tax Portfolios: Proportions of Total 2008 Tax Revenues Ranked by the Herfindahl-Hirschman Index

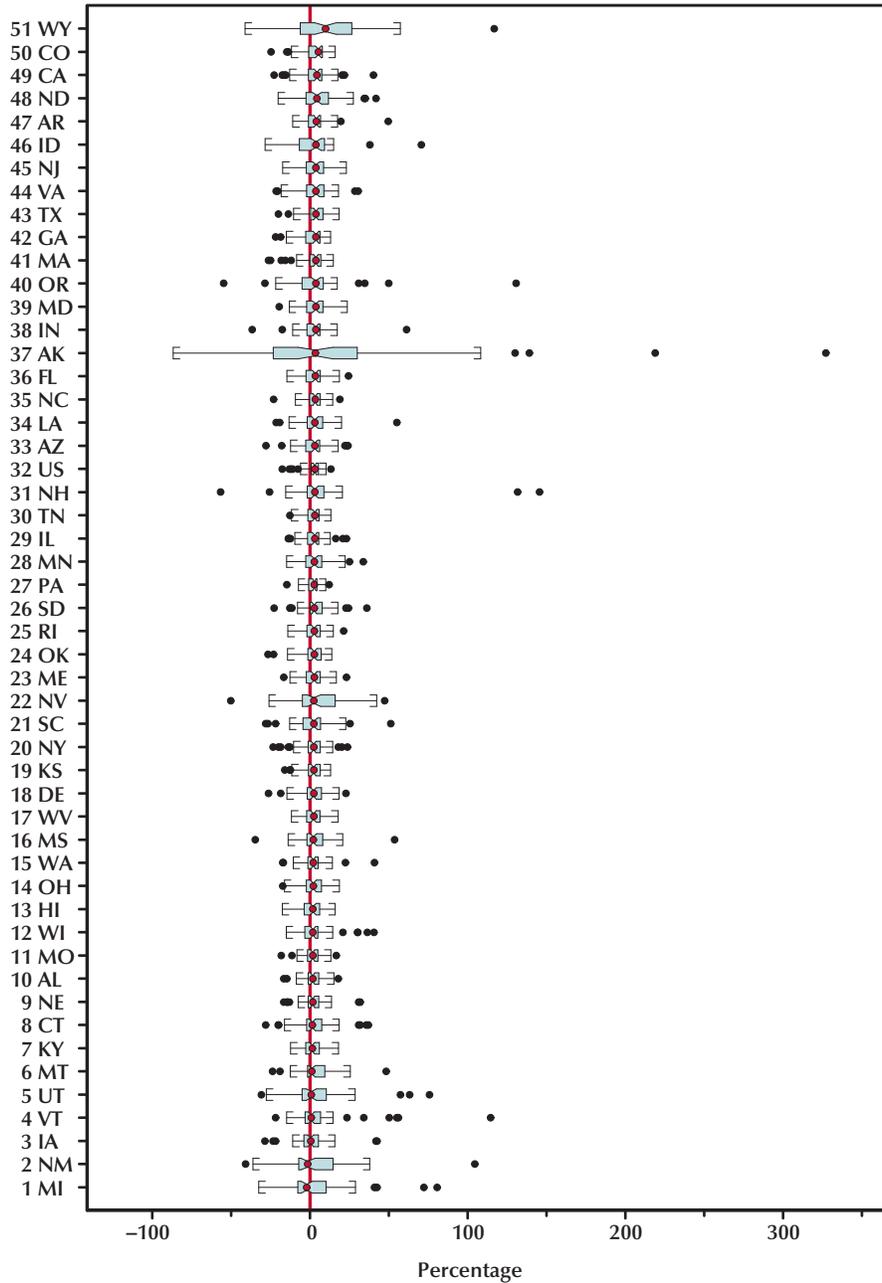


NOTE: Ranked from least to most diverse.

SOURCE: Census Bureau Annual State and Local Government Tax Revenue.

Figure 9A

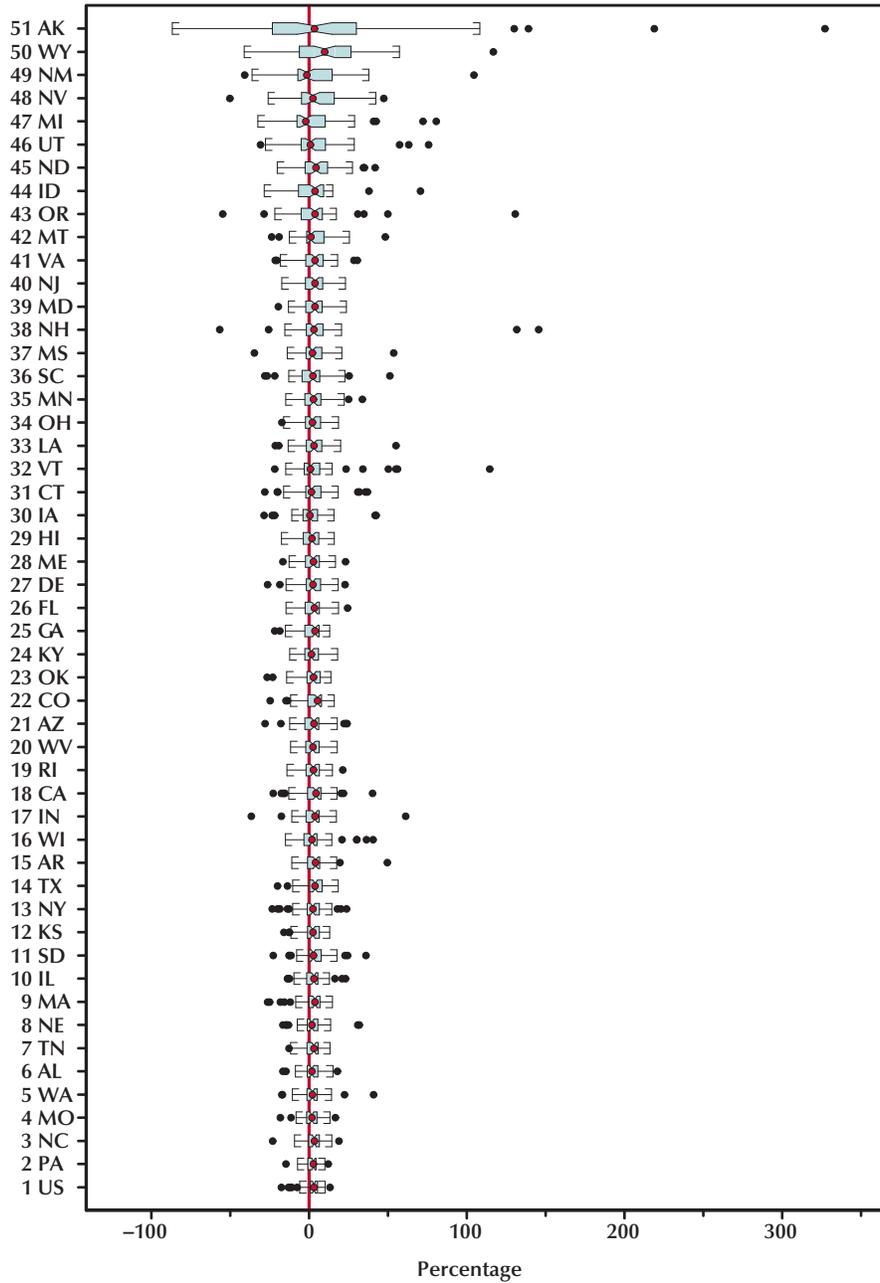
State Tax Revenues: Year-Over-Year Growth Rates in Quarterly Tax Receipts Ranked by Median of Percentage Change (1995-2009)



SOURCE: Census Bureau Quarterly State and Local Government Tax Revenue.

Figure 9B

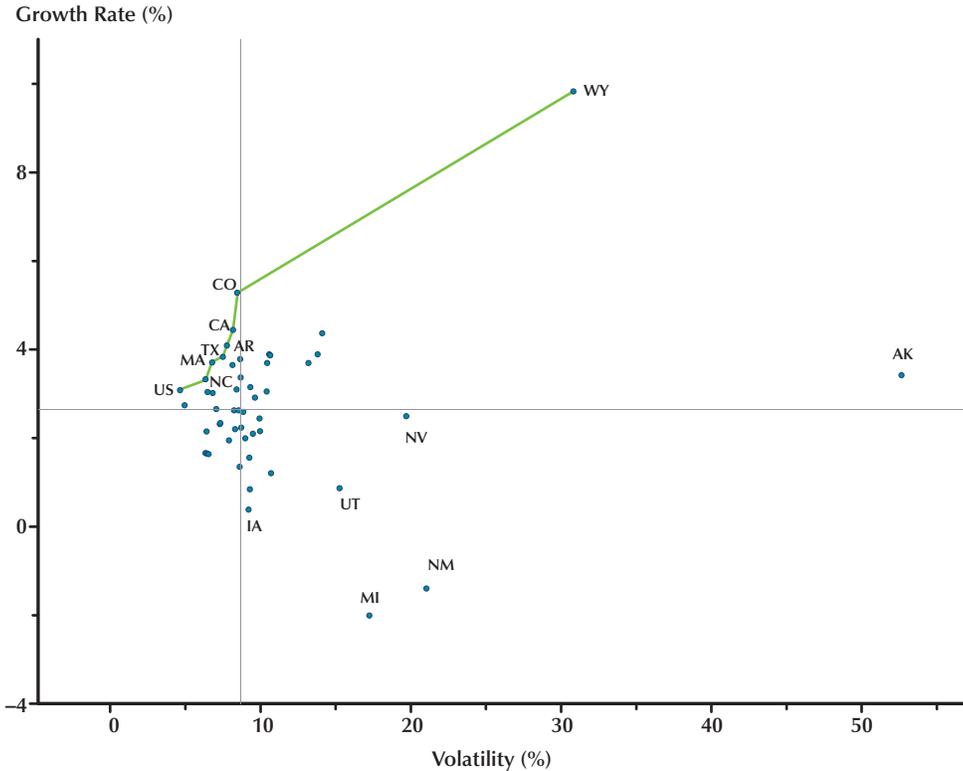
State Tax Revenues: Year-Over-Year Growth Rates in Quarterly Tax Receipts Ranked by IQR of Percentage Change (1995-2009)



SOURCE: Census Bureau Quarterly State and Local Government Tax Revenue.

Figure 10

The Growth-and-Volatility Efficiency Frontier for State Tax Revenues: Year-Over-Year Percentage Change in Quarterly Total State Tax Receipts (1995-2009)



SOURCE: Census Bureau Quarterly State and Local Government Tax Revenue.

depends heavily on the sales tax. Oregon, its neighbor, is a high-growth state because it depends on the individual income tax. Thus we see that tax structure might strongly influence the growth rate.

Figure 9B ranks states by the volatility of their tax revenues as measured by the IQR and shows that the western states with high growth rates also have high levels of variability. This is especially true for Alaska and Wyoming. Interestingly, Texas is not as volatile. As expected because of diversity, the U.S. aggregate of total state revenues is not very volatile. The highly stable tax receipts of Tennessee are probably influenced by its dependence on the retail sales tax rather than the individual income tax.

The Efficiency Frontier for State Revenues

Figure 10 plots the growth and volatility of state tax revenue based on the medians in 9A and IRQs in Figure 9B, respectively. The line in Figure 10 identifies those states with efficient combinations. As mentioned, Wyoming has both a high growth rate and high volatility and finds itself on the efficiency frontier. Colorado, California, Arkansas, and Texas seem to achieve relatively higher growth rates without incurring significantly more volatility. Other states that distinguish themselves by being on the efficiency frontier are Massachusetts and North Carolina. This raises an interesting future research question about the combinations of economic and tax structure characteristics that generate

tax revenues with desirable growth and volatility attributes.

AD HOC OBSERVATIONS OF INDIVIDUAL STATES

Ad hoc comparisons give some insight into tax policies that can exacerbate or moderate a state's dependence on the business cycle. They can also highlight potential practices that might moderate the adverse effect of low-growth and/or highly volatile state economies on tax revenues.

In Figures 11 to 23, summary diagrams for selected states offer insight into best practices. Panel A compares the growth rates of the given state's tax receipts (green), its economy (red), and the national economy (blue). The box plots in Panel B compare the distributions of the rates of change for these same three categories. The scatter plots in Panels C and D show how the given state's growth and volatility compared with the growth and volatility of all other individual state economies and tax structures, respectively. Panel E shows the composition and balance of the given state's tax portfolio.

First, consider Texas (Figure 11), which distinguishes itself by having both its economy and tax revenues on the efficiency frontier. Both exhibit medium growth and volatility (Panels C and D, respectively). Its economy closely follows the national pattern, which is evident in the time-series graph (Panel A) and the box plots (Panel B). Its tax portfolio depends primarily on the sales tax; however, "other" revenues also contribute significantly to total state revenues (Panel E). This tax portfolio places Texas's revenues in the moderate-growth and moderate-volatility category (Panel D).

Neither the Arkansas (Figure 12) nor Tennessee (Figure 13) economies reach the efficiency frontier (Panels C), but their tax portfolios give them improved combinations of growth and volatility that put their tax revenues on the efficiency frontier (Panels D, respectively). Both economies closely mimic the national growth pattern (Panels A). Interestingly, their tax portfolios differ (Panels E): Arkansas depends on a combination of property, sales, individual income, corporate income, and

"other" tax categories. This combination keeps Arkansas's tax revenues from being placed with its economy in the low-growth/low-volatility quadrant, by supporting a higher relative growth rate without adding too much additional volatility. Tennessee depends primarily on the sales tax.

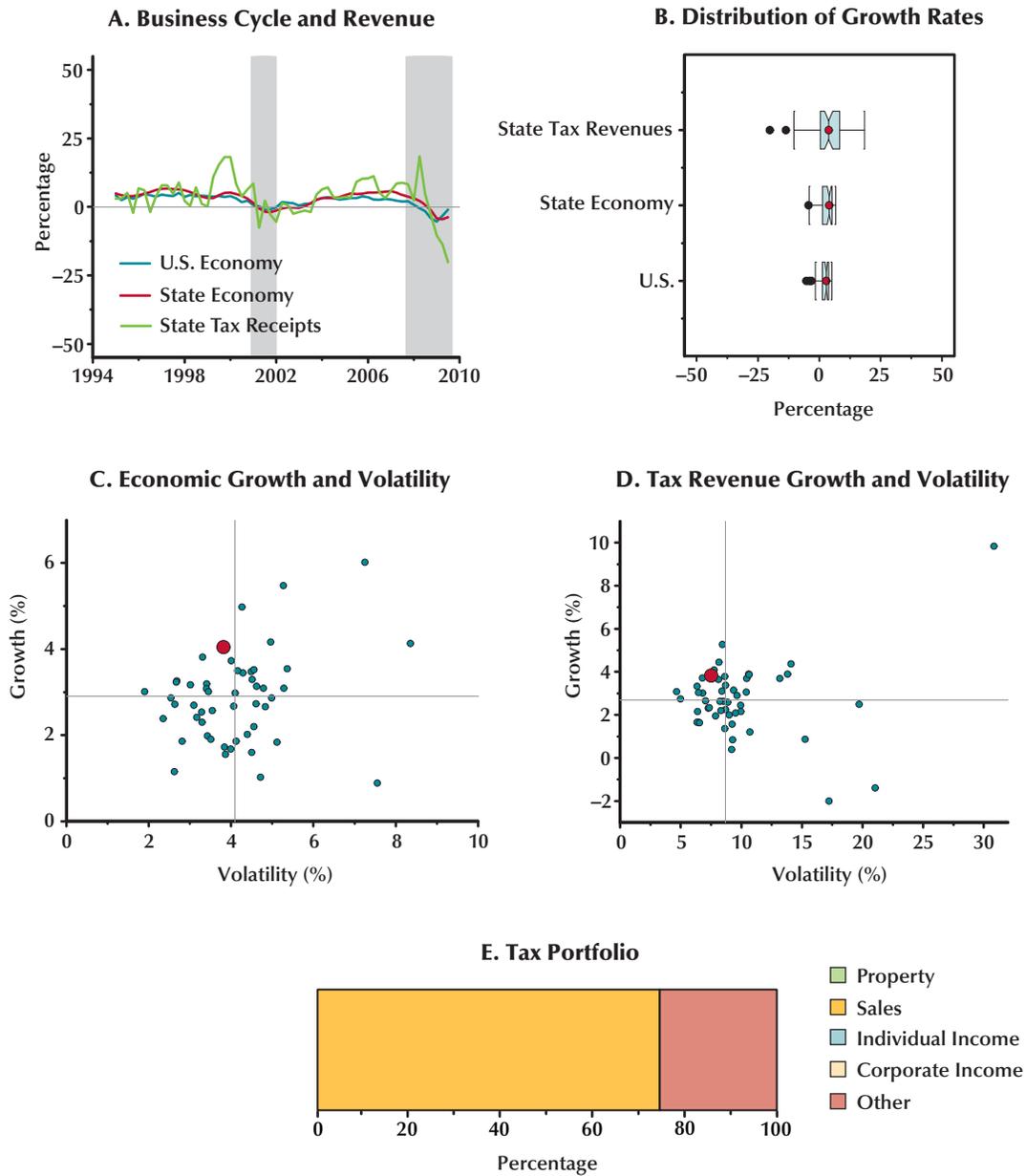
For Nevada (Figure 14), a high growth rate and high volatility place its economy on the efficiency frontier (Panel C). Nevada's dependence on the sales tax without any income tax (Panel E) significantly hinders the growth rate of its tax revenues but, surprisingly, does not commensurately decrease its volatility. The result is an inferior combination of low growth and high volatility (Panel D).

North Dakota (Figure 15) has a tax portfolio that generates higher growth and volatility relative to other states (Panel E). Its economy does not follow the national pattern as closely as the previously discussed states. Sometimes its growth rate exceeds that of the national business cycle and sometimes it is lower. North Dakota does not seem to have experienced the extreme declines that occurred in many other states during the Great Recession. North Dakota's tax portfolio is balanced and depends on sales, individual income, and "other" taxes.

The macroeconomic challenges in Michigan (Table 16) strongly influence its tax revenue. As mentioned, it is the only state with negative average economic growth. The low economic growth and corresponding high volatility (Panel C) have created severe fiscal challenges. Even though Michigan has a balanced dependence on sales and income taxes (Panel E), its tax system seems to exacerbate the revenue challenges, as its tax revenues remain in the unfavorable low-growth/high-volatility quadrant (Panel D).

As mentioned, Washington and Oregon (Figures 17 and 18) provide an interesting comparison in tax policy. They have similar economies that are more volatile than the national economy but that also have higher expected growth rates than other state economies. Oregon's economy is slightly more volatile than Washington's. This dissimilarity lies mostly in each state's reliance on one major tax. Oregon depends primarily on the individual income tax, Washington on the retail sales tax (Panels E, respectively). The growth and volatility of each state's tax revenue shows the

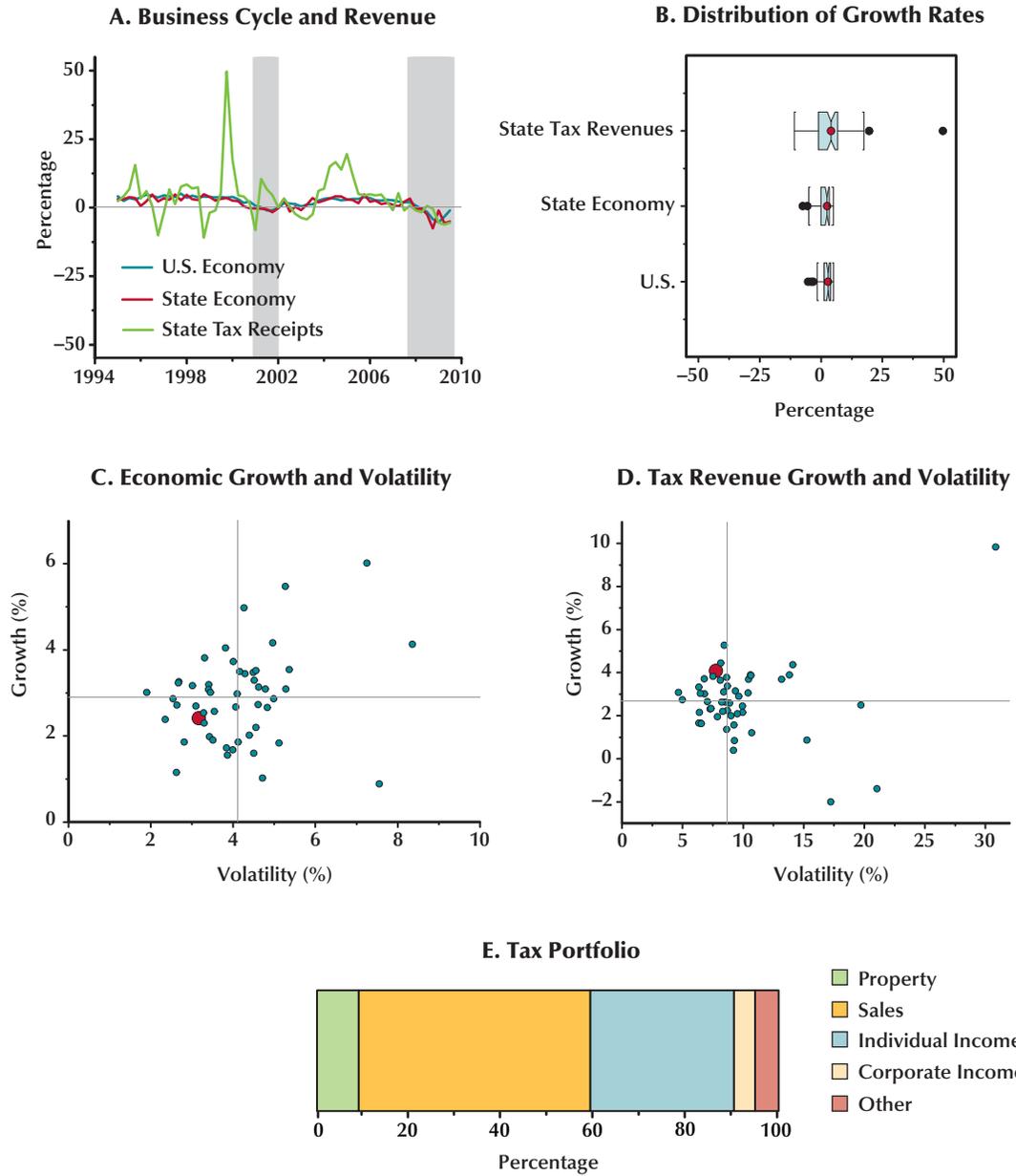
Figure 11
Texas Growth Rate and Volatility (1995-2009)



SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes and Census Bureau Quarterly State and Local Government Tax Revenue.

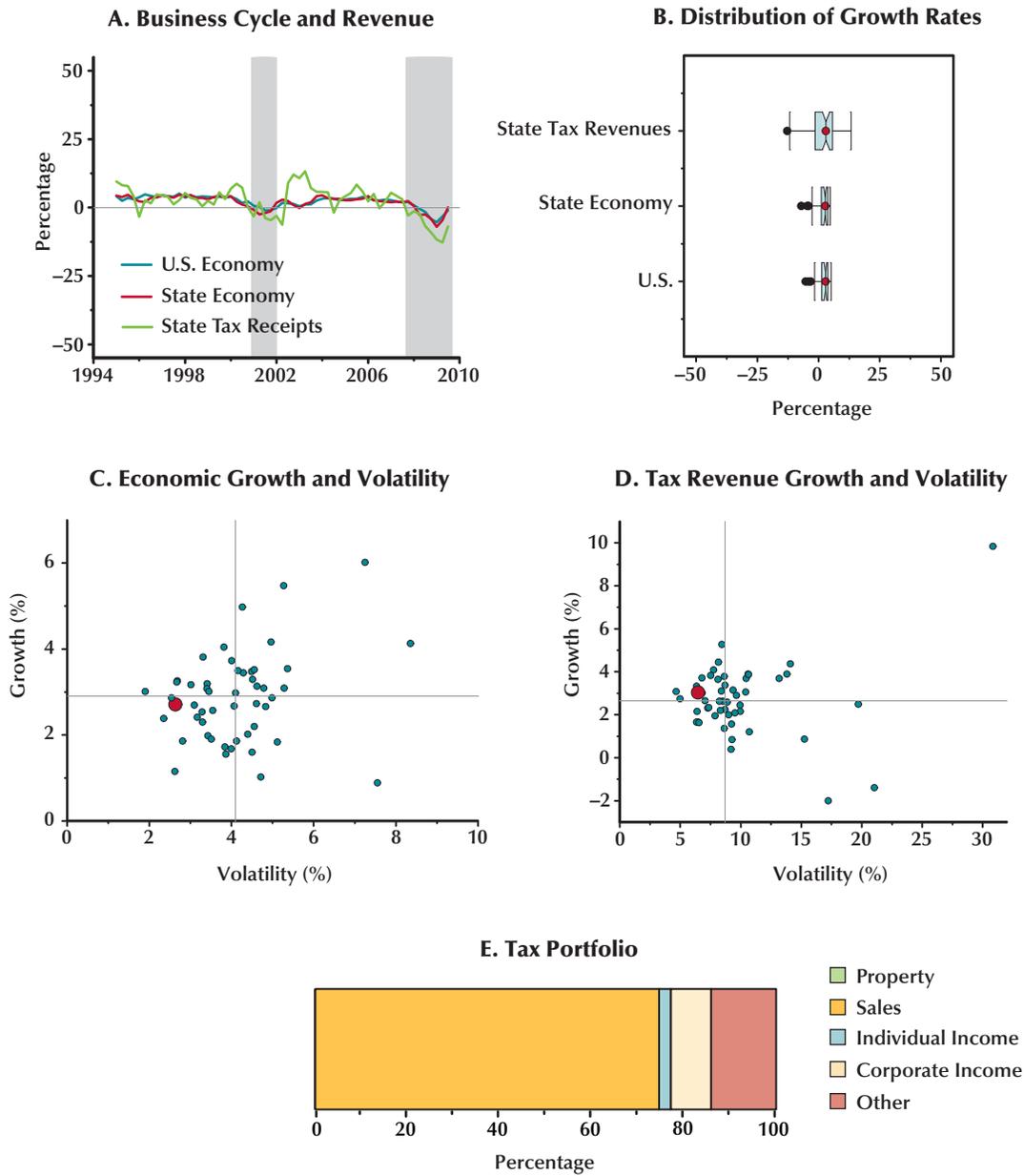
Figure 12

Arkansas Growth Rate and Volatility (1995-2009)



SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes and Census Bureau Quarterly State and Local Government Tax Revenue.

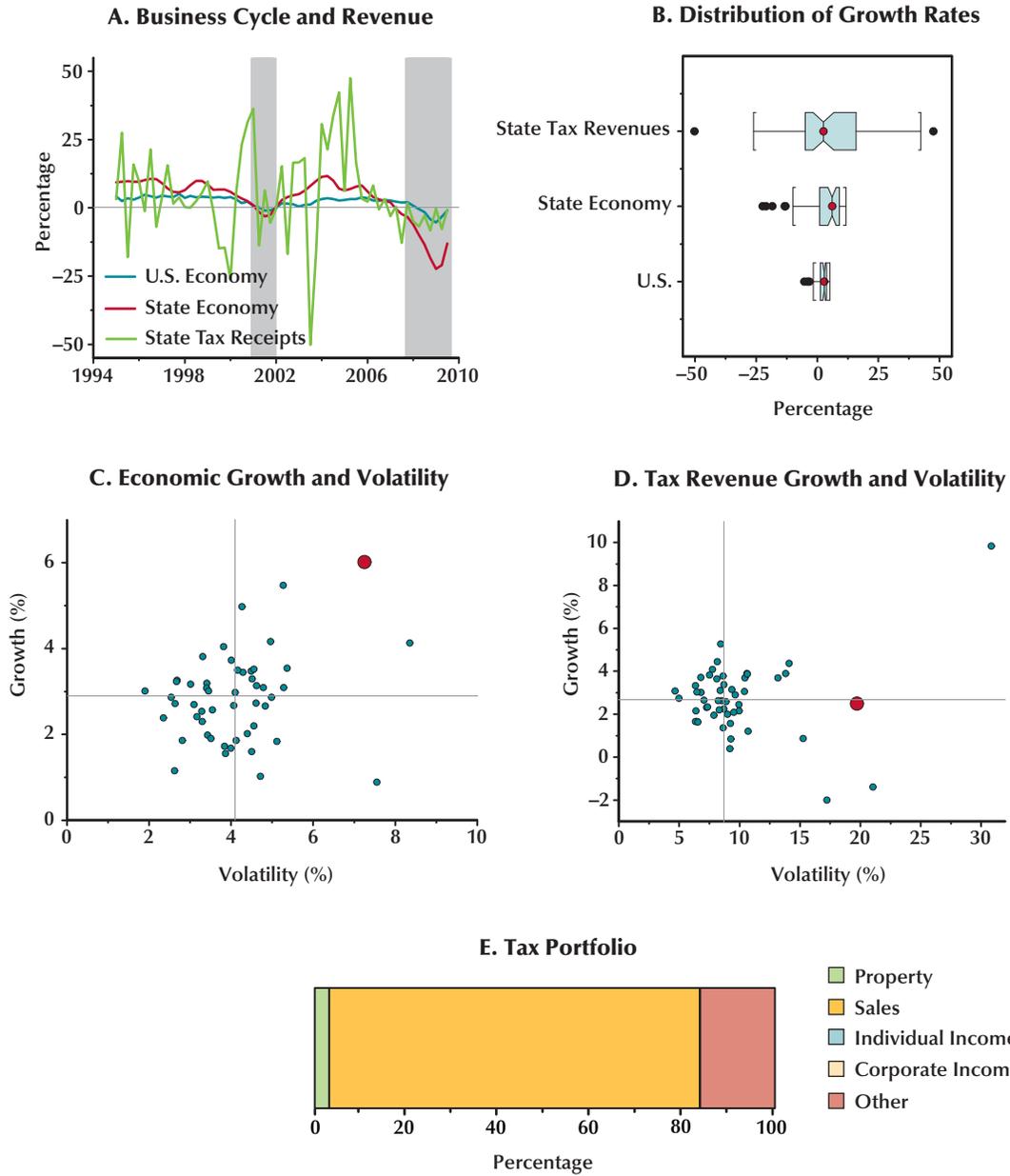
Figure 13
Tennessee Growth Rate and Volatility (1995-2009)



SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes and Census Bureau Quarterly State and Local Government Tax Revenue.

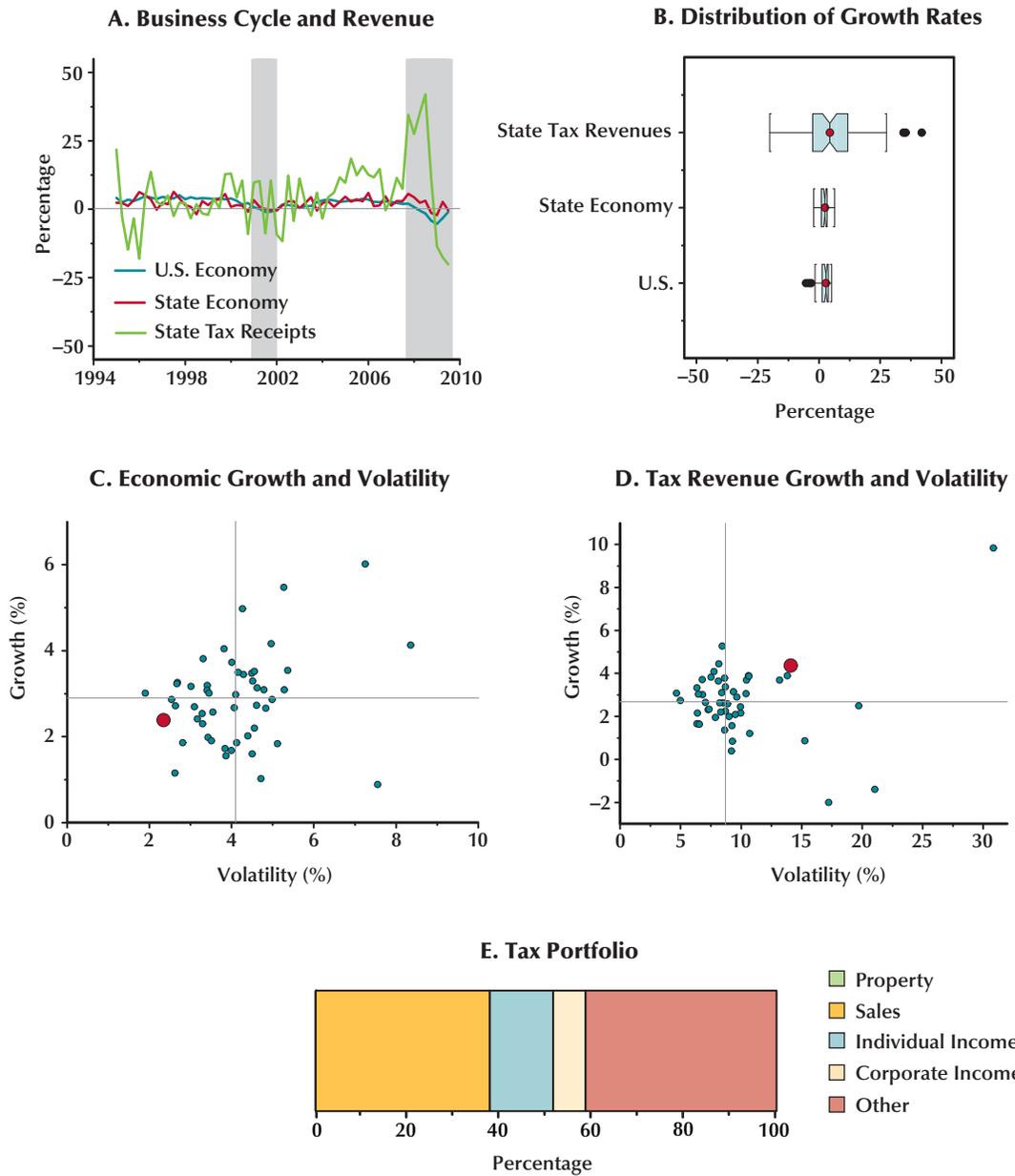
Figure 14

Nevada Growth Rate and Volatility (1995-2009)



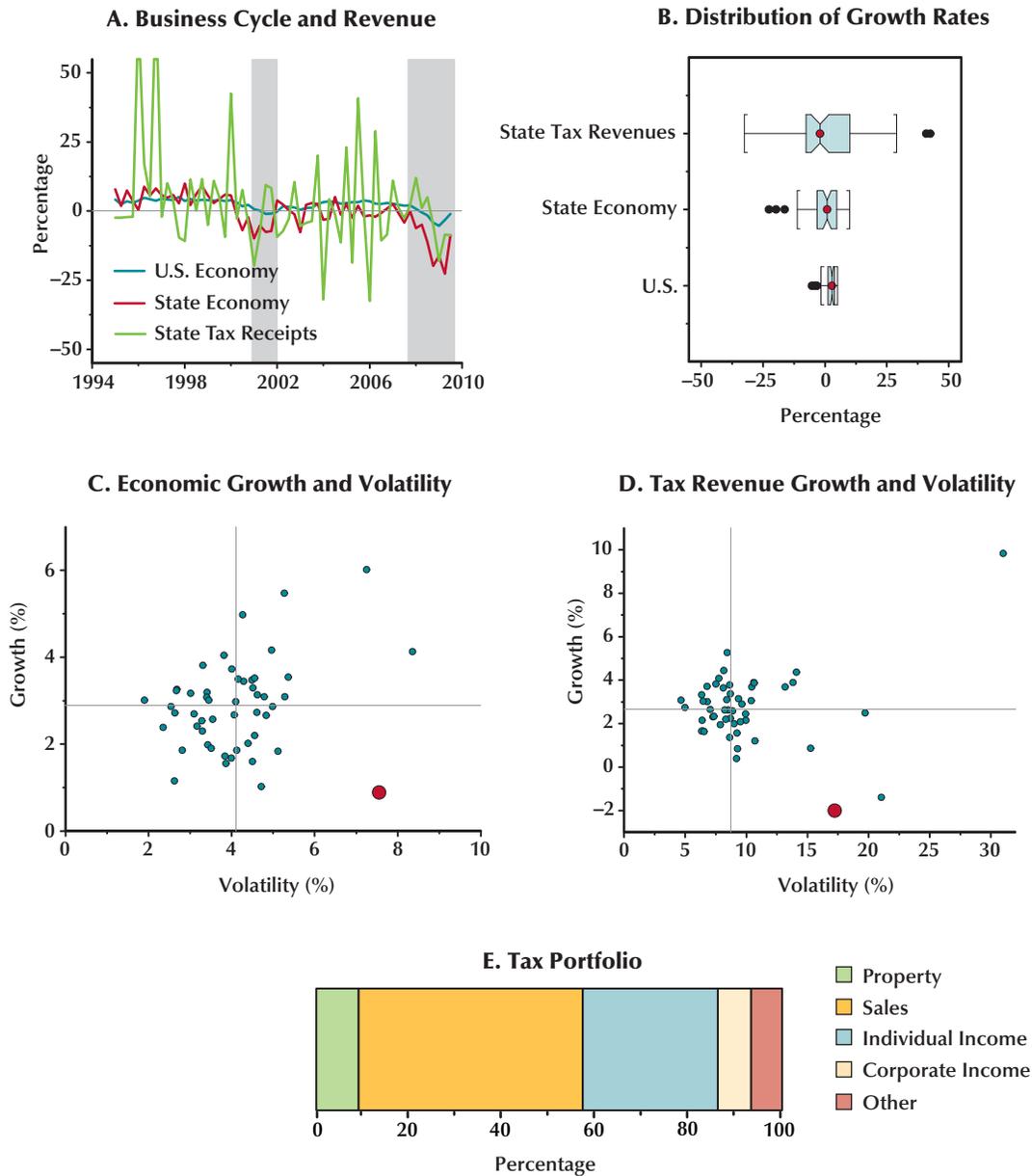
SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes and Census Bureau Quarterly State and Local Government Tax Revenue.

Figure 15
North Dakota Growth Rate and Volatility (1995-2009)



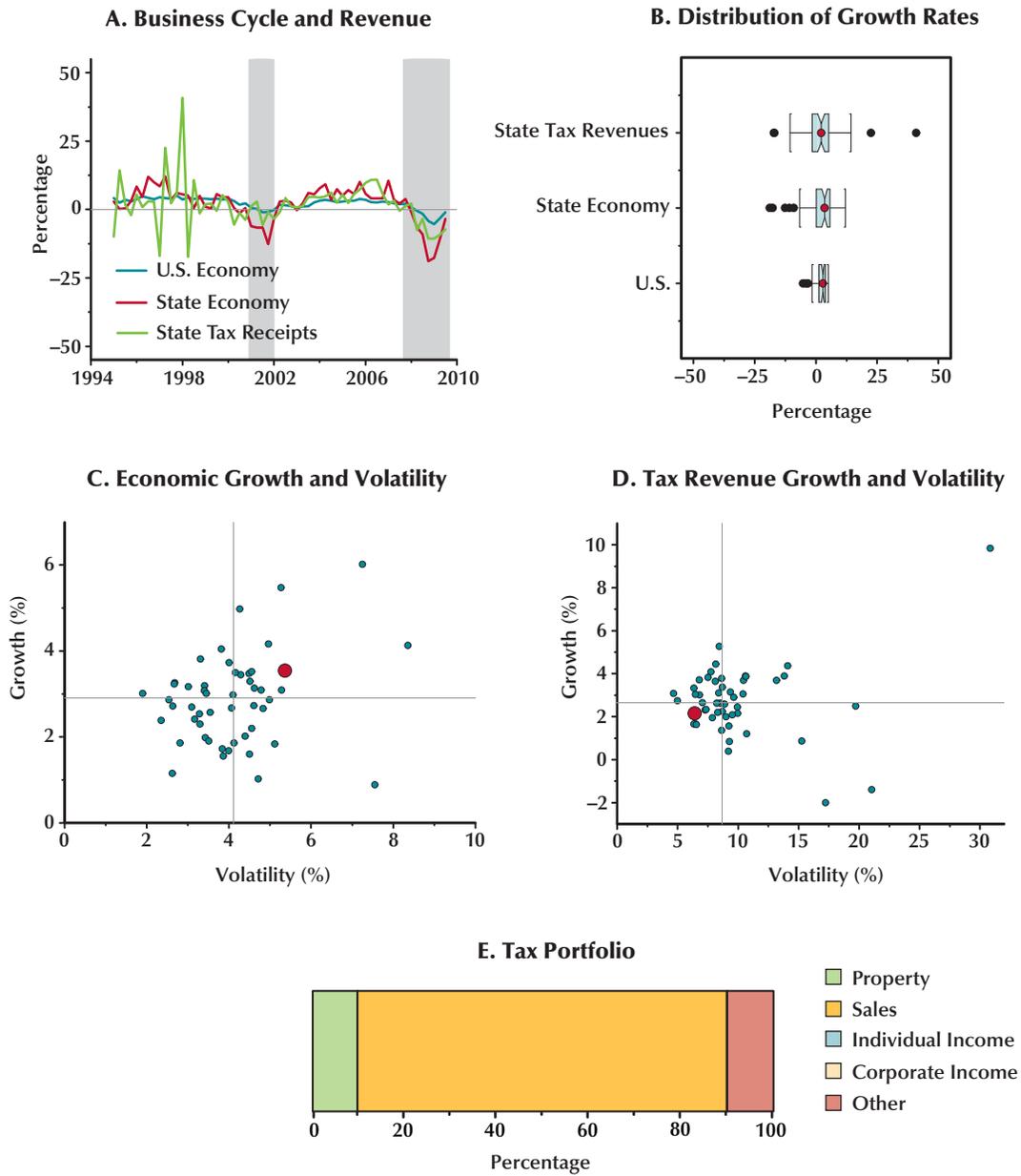
SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes and Census Bureau Quarterly State and Local Government Tax Revenue.

Figure 16
Michigan Growth Rate and Volatility (1995-2009)



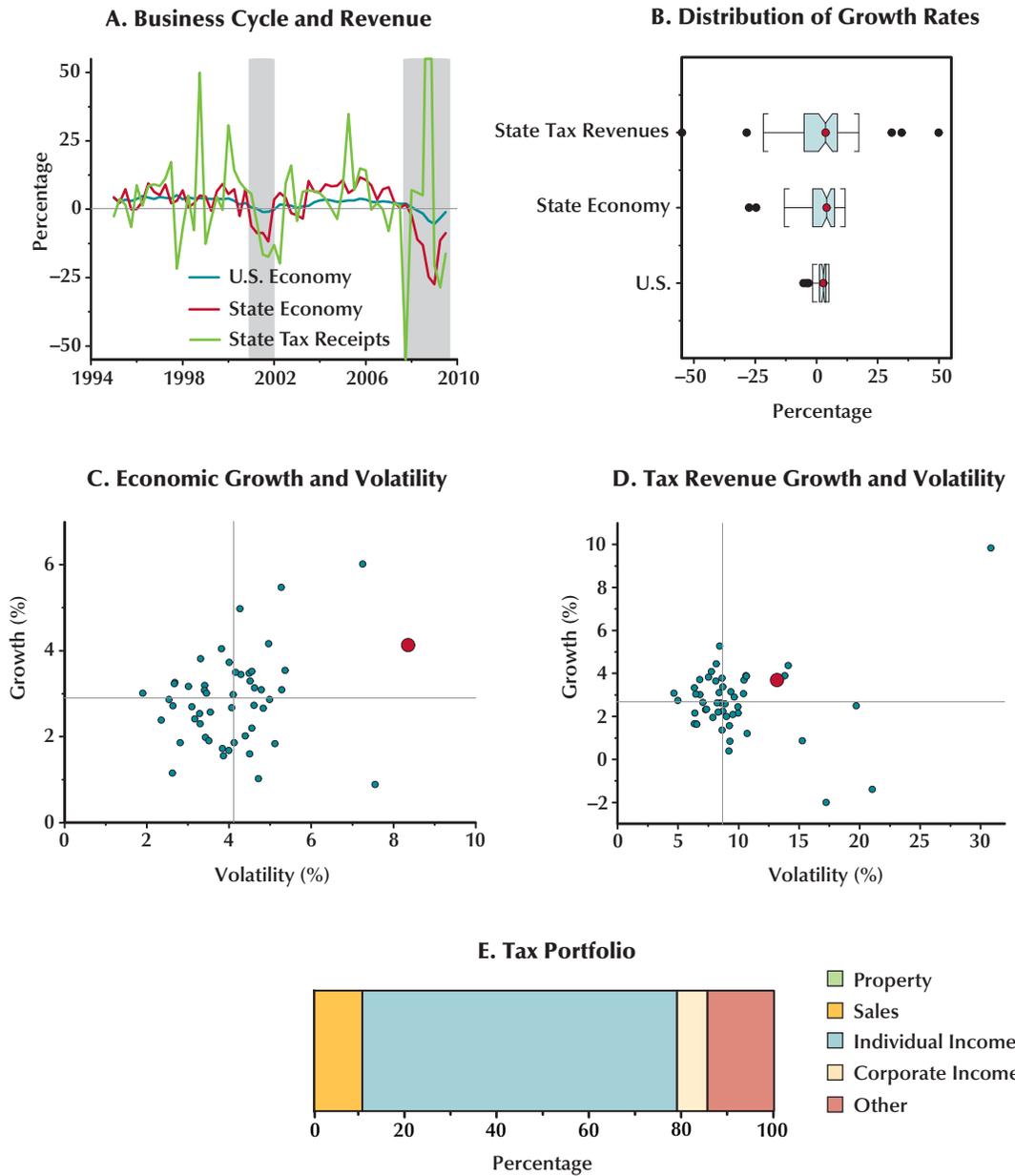
SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes and Census Bureau Quarterly State and Local Government Tax Revenue.

Figure 17
Washington Growth Rate and Volatility (1995-2009)



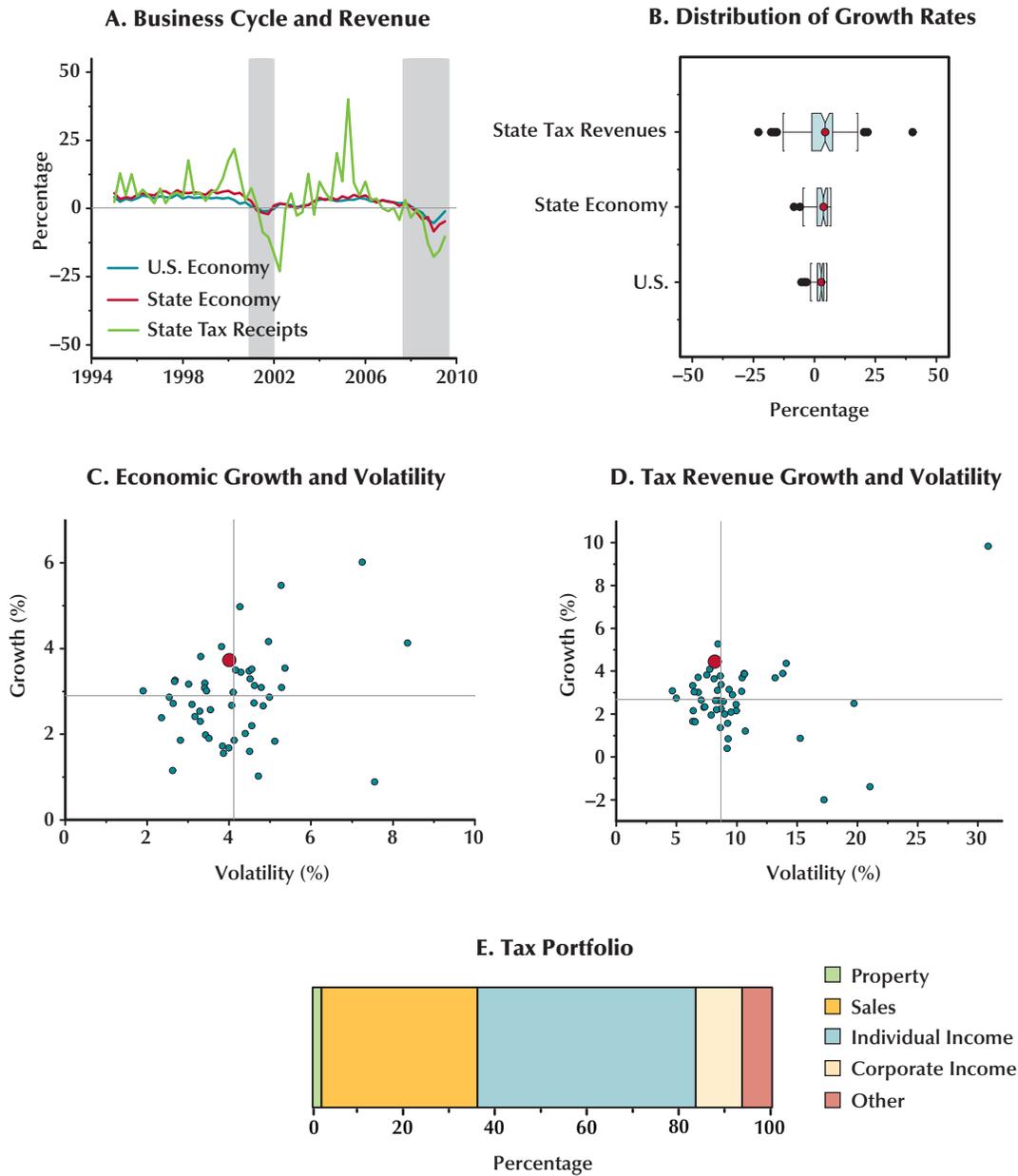
SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes and Census Bureau Quarterly State and Local Government Tax Revenue.

Figure 18
Oregon Growth Rate and Volatility (1995-2009)



SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes and Census Bureau Quarterly State and Local Government Tax Revenue.

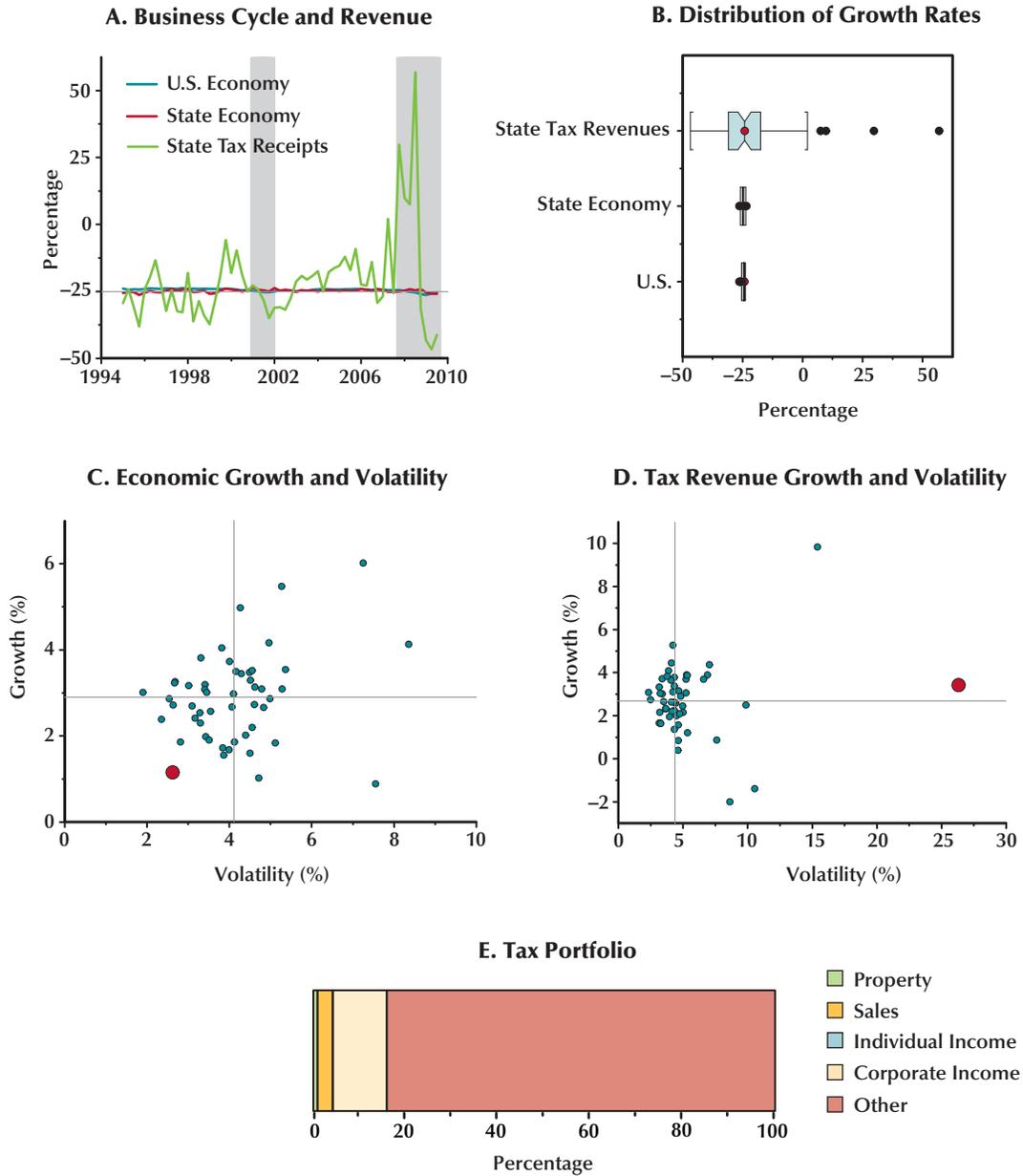
Figure 19
California Growth Rate and Volatility (1995-2009)



SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes and Census Bureau Quarterly State and Local Government Tax Revenue.

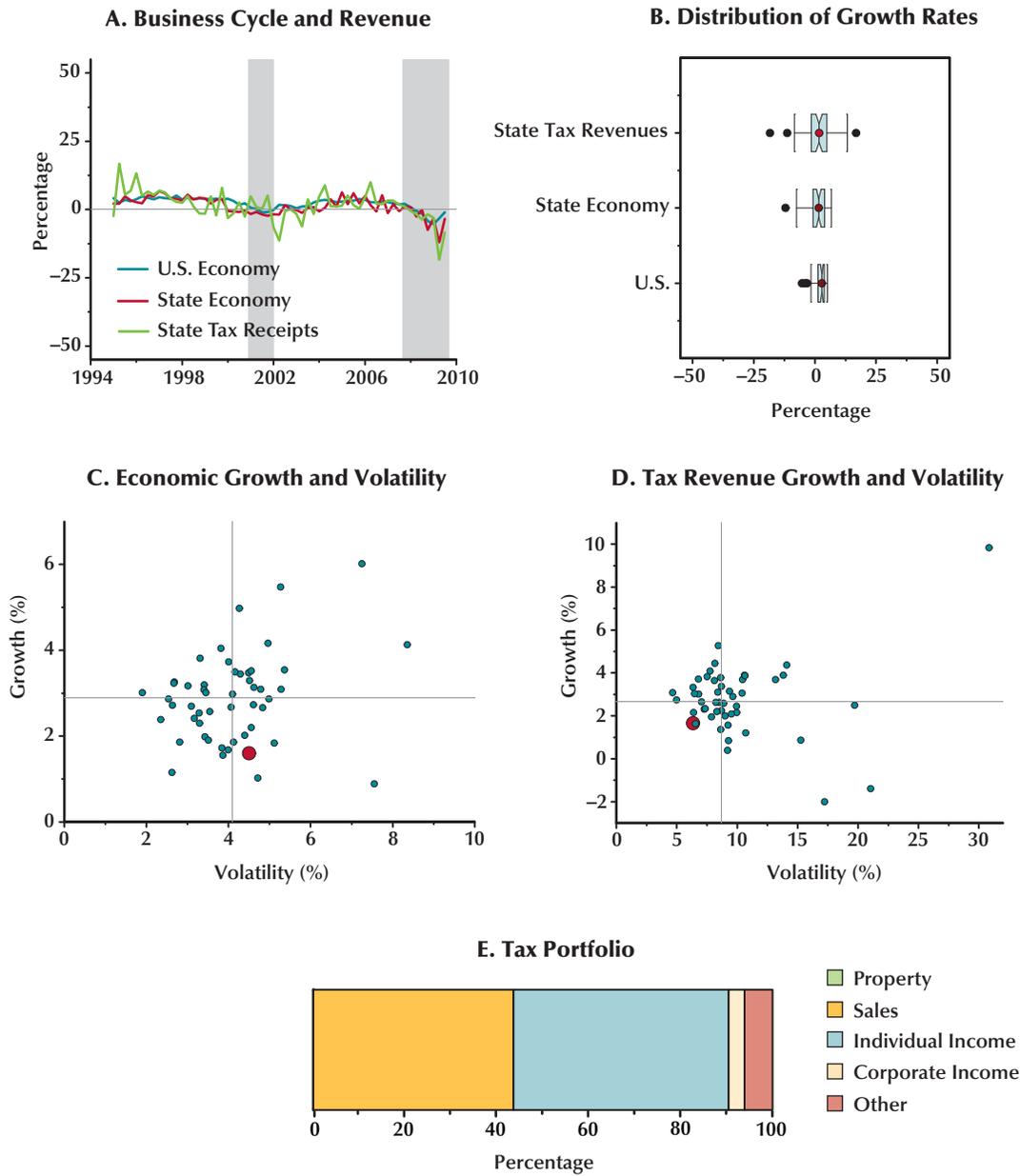
Figure 20

Alaska Growth Rate and Volatility (1995-2009)



SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes and Census Bureau Quarterly State and Local Government Tax Revenue.

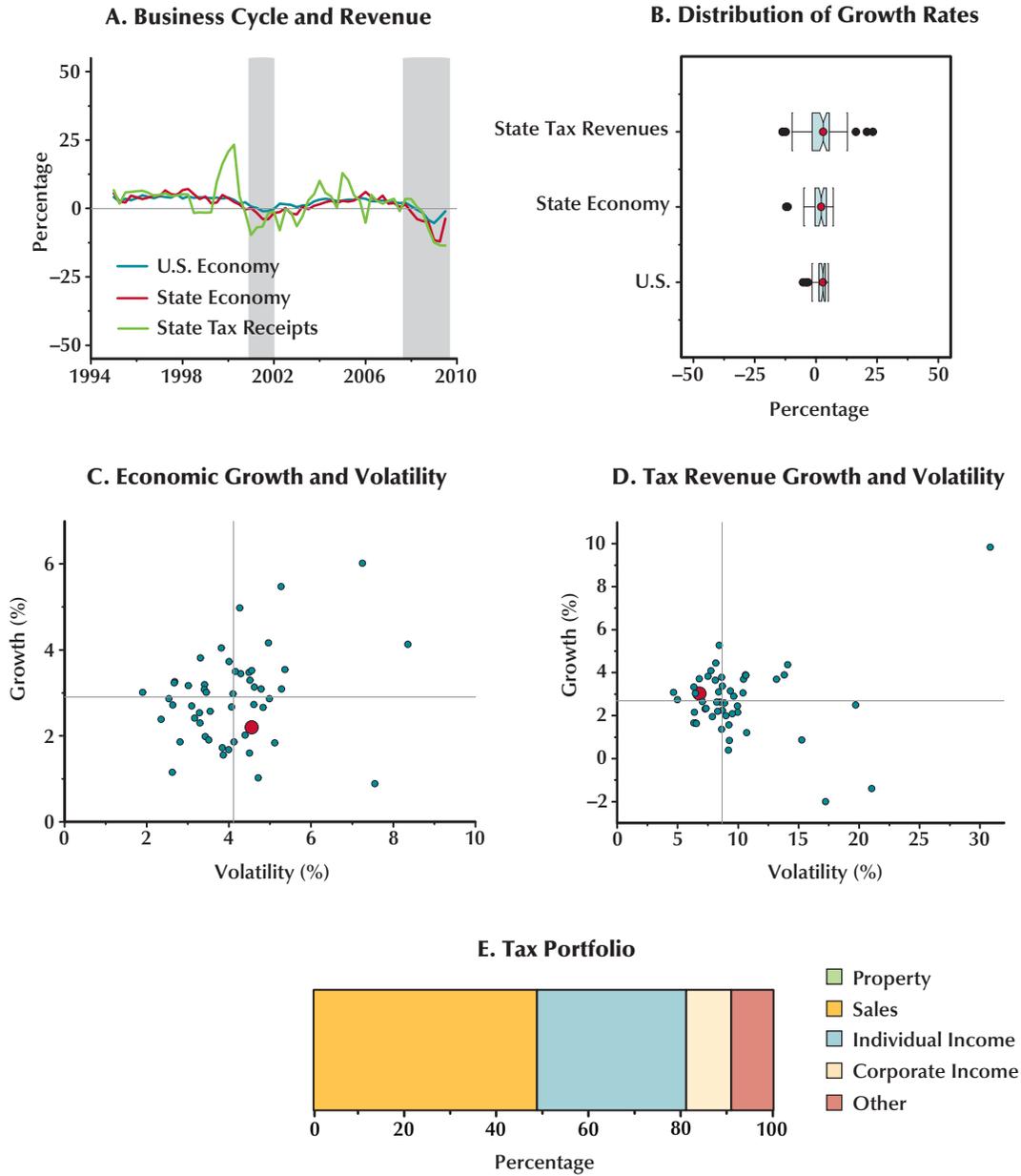
Figure 21
Missouri Growth Rate and Volatility (1995-2009)



SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes and Census Bureau Quarterly State and Local Government Tax Revenue.

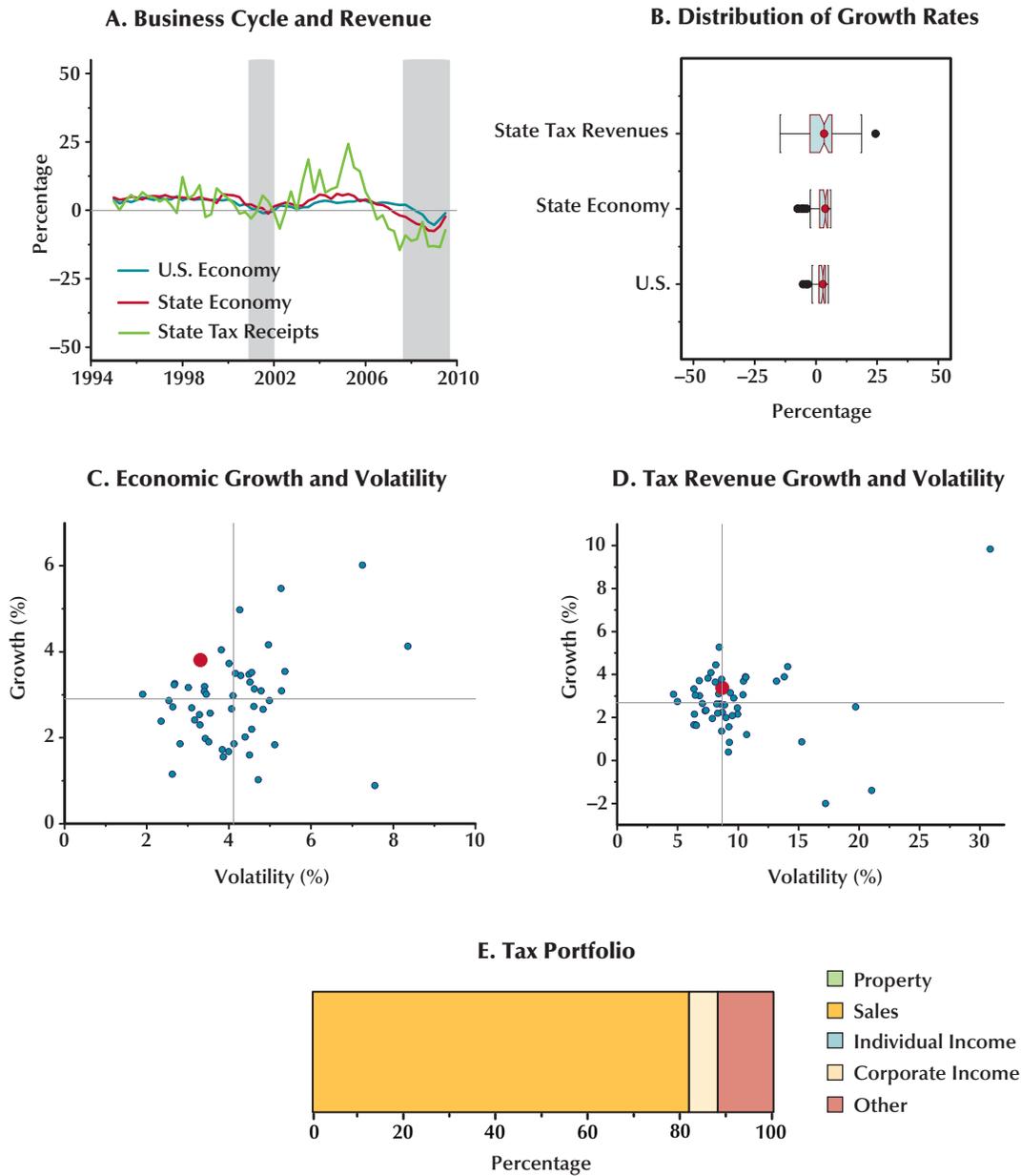
Figure 22

Illinois Growth Rate and Volatility (1995-2009)



SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes and Census Bureau Quarterly State and Local Government Tax Revenue.

Figure 23
Florida Growth Rate and Volatility (1995-2009)



SOURCE: Federal Reserve Bank of Philadelphia State Coincident Indexes and Census Bureau Quarterly State and Local Government Tax Revenue.

varying effects of these choices. Washington's dependence on the sales tax places its tax revenues in the low-growth/low-volatility quadrant (Figure 17, Panel D). Oregon's dependence on the income tax keeps its tax revenues far from the efficiency frontier by maintaining or increasing the undesirable combination of lower expected growth for the given level of volatility.

Interestingly, California (Figure 19) exhibits no extremes in growth and volatility for either its economy or tax revenues. It might be, therefore, that the well-documented fiscal travails of California are more strongly related to its budgeting and legislative process than to inherent tax structure deficiencies or economic instability.

Alaska (Figure 20) is an example of the extreme potential effects on growth and volatility that can be exerted by a tax portfolio. Because of the wide fluctuations in the rates of change shown in Panel A, it is difficult to evaluate Alaska's economy relative to the U.S. economy. The panel does show, however, the dominance of revenue volatility relative to the economy. Alaska's choice to depend on "other" and corporate income taxes rather than sales or individual income taxes causes its tax revenues to have particularly high expected growth and volatility.

The additional examples in Figures 21 through 23 further demonstrate the potential positive and negative effects of tax policy. Although Missouri's economy sits in the low-growth/high-volatility quadrant (Figure 21, Panel C), its tax portfolio successfully places its tax revenues in the more-desirable low-growth/low-volatility quadrant (Panel D). Illinois's economy sits in the inferior low-growth/high-volatility quadrant (Figure 22, Panel C), and its tax revenues in the high-growth/low-volatility quadrant (Panel D). Finally, although Florida's economy sits on the efficiency frontier (Figure 23, Panel C), its tax code keeps its tax revenues off the efficiency frontier by decreasing their growth and increasing their volatility relative to those measures for other states (Panel D).

BUDGETING IMPLICATIONS

As mentioned, revenue adequacy is a key criterion used to evaluate tax systems. Because elected officials rarely have the political ability to simply

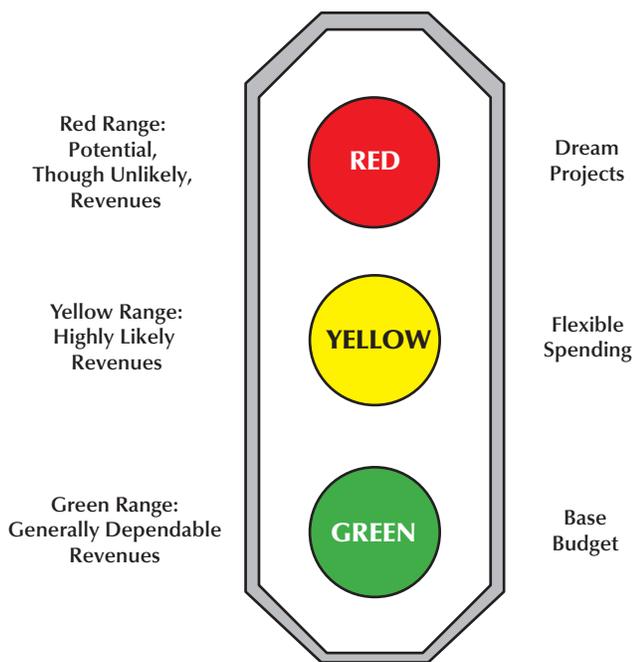
stop funding services such as education or public safety, they need reliable revenue sources. For this reason, good public policy suggests that states work to mitigate revenue uncertainty. While recognizing the importance of equity and efficiency in tax policy formulation, even the best-intended tax design cannot offset the instability resulting from tax schemes that magnify rather than attenuate business cycle effects.

Super (2005) notes that economists' growing sophistication in understanding business cycles should translate into better prediction of fiscal cycles. Given the severity of the current downturn, however, his observations may be slightly premature and overly optimistic. Nonetheless, understanding the fiscal consequences of downturns may help develop policies that allow rational responses to fiscal trauma. Two examples of methods that incorporate growth and volatility into budgeting decisions are revenue semaphores and value at risk (VAR). Neither method has anything to do with reforming tax systems to make them more stable. They simply show that information about growth and volatility can improve state policy processes and budget outcomes.

Revenue Semaphores

Revenue semaphores (Cornia, Nelson, and Wilko, 2004) aid the budgeting process by providing a graphical approach for communicating expected growth and volatility of each potential revenue source so that expenditures may be prioritized. Rather than provide a single-valued point forecast of tax revenues, revenue semaphores categorize the distribution of potential tax receipts into three different categories. As shown in Figure 24, the first, green for "go," identifies those revenues available for basic expenditures. Although a small probability always exists for a major economic upheaval, these revenues can usually be considered safe parts of base budgets. The second category, yellow for "caution," includes highly likely revenues, which are allocated to projects and expenditures likely to be fully funded. With this categorization, in the case of revenue shortfalls, state executive and legislative branches can more easily see where they need to cut back to balance the budget. The third category, red for "stop,"

Figure 24
Revenue Semaphores



identifies potential—although unlikely—revenues that could allow capital expenditures or tax cuts in the case of a very large revenue surplus. Even though “red revenues” are highly unlikely, anticipating these potential windfall resources could foster more transparent decisionmaking at the end of the budget year.

Implementation of revenue semaphores requires that analysts and officials consider the growth and volatility of their state economies. They must also consider the potential impact on growth and volatility that comes from their chosen tax portfolio. These factors, as they interact to determine available revenues in the budgeting process, determine the boundaries for the green, yellow, and red categories of revenue semaphores.

Value at Risk and Optimal Rainy Day Funds

Nelson and Cornia (2004) use the financial concept of VAR to show how states should consider

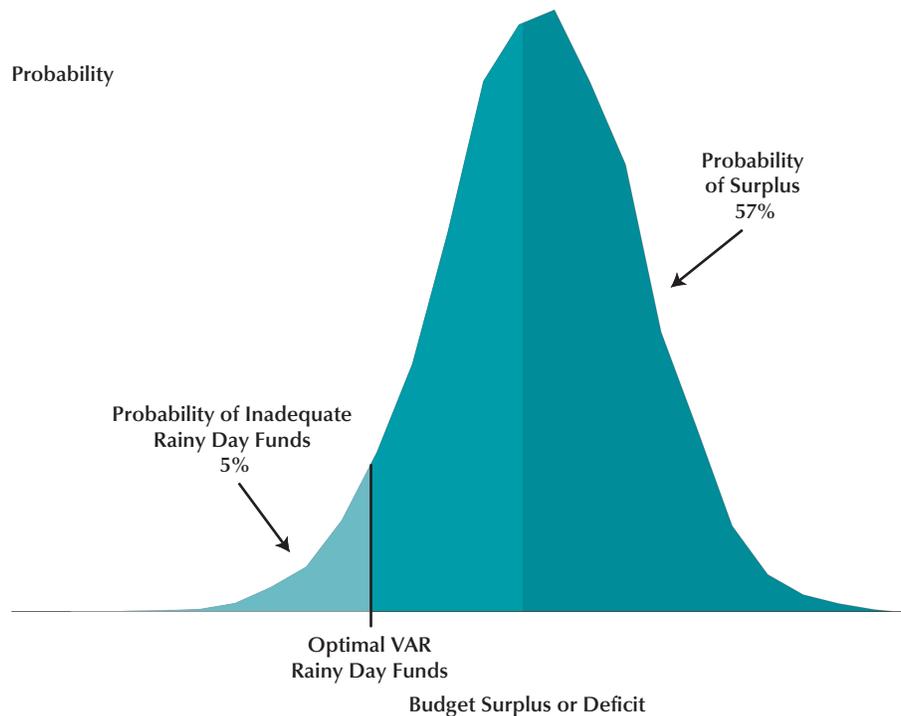
the entire probability distribution of budget surpluses/deficits when determining the optimal size of their rainy day funds. Probability distributions similar to the one shown in Figure 25 are critical for the application of VAR methodology to rainy day funds.

If one considers state rainy day funds as a type of insurance, it is reasonable to recognize that it is infeasible to totally insure against all adverse and improbable outcomes. The size of a rainy day fund needed to cover the worst-possible budget deficit would be neither politically possible nor financially feasible. Therefore, when determining the optimal size of a rainy day fund, decisionmakers must decide how large of a budget deficit can be insured. Using VAR, decisionmakers simply determine the probability, *p*, of the deficit size they cannot insure. The dollar amount that leaves a probability of *p* in the left tail of the probability distribution, like the one shown in Figure 25, corresponds to the VAR. This value then determines the size of the rainy day fund.

The expected growth and volatility of tax revenues strongly impacts the probability distribution of deficits/surpluses, such as the one in Figure 25. For this reason, states should carefully consider the unique characteristics of their economy and tax portfolio when calculating the optimal size of their rainy day funds. The application of a simple rule of thumb without customization to a state’s economic and tax environment will result in a suboptimal solution.

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

This analysis establishes the joint importance of economic conditions and tax portfolios in determining the growth and volatility of state tax revenues. It also reveals that a variety of growth and volatility combinations exist among states. As states consider tax reform and revenue-enhancing measures in the current fiscal crisis, they should carefully anticipate and consider the possible impacts of their proposed changes on the growth and volatility of their unique tax revenue portfolios.

Figure 25**Optimal Rainy Day Funds Determined as Value at Risk**

The current recession has wrought budgeting havoc among states. The Philadelphia Fed's coincident indexes clearly establish the historic gravity of the most recent economic downturn. Although some states have been more severely affected than others, all states have suffered challenges due to the economic slowdown. Because state economies do not react uniformly to the national business cycle, state officials must take care that they tailor policy proposals to the unique characteristics of their economy.

In the short run, states cannot alter the volatility of their economies, but they can change their tax portfolios to minimize the effects of the business cycle on their fiscal health. For this reason they need to consider the natural tendencies of their economies when formulating tax policy. This means that states with volatile economies might want to choose tax portfolios that minimize the impact of national macroeconomic trends and

avoid volatile funding sources that can result in even more volatile revenues. States with stable economies might consider adopting more aggressive tax portfolios.

This analysis recognizes the importance of sales and individual income taxes as the principal revenue sources in state budgeting. The sales tax offers stability but at the cost of a lower growth rate. The individual income tax offers growth but at the cost of increased volatility. Although the property tax currently is used mostly for financing local governments, its attractive growth and volatility combination might mean that states should consider adopting it as an additional source of funding to complement the growth and volatility characteristics of the sales and individual income taxes.

More research is needed to understand how a state's economy and tax portfolios interact to determine the growth and volatility of its tax revenues.

Cornia and Nelson

Better understanding of the probabilistic characteristics of tax revenues will improve the budgeting process in ways beyond the revenue semaphores and optimal rainy day funds discussed in this paper. Formal econometric modeling can exploit

the panel nature of the economic and revenue data to formalize the ad hoc findings presented in this paper. The resulting knowledge could significantly improve tax reform and budget-balancing public policy decisions.

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Commentary

Elizabeth C. McNichol

The deepest economic downturn since the Great Depression has caused state revenues to plunge and put state services at risk. Recovery from the resulting state fiscal crisis will take years and require strong and stable revenue growth. The Cornia and Nelson (2010) paper, as well as earlier research, demonstrates that a tax system that both grows adequately and is stable must be diverse—that is, include a range of different taxes. However, all taxes are volatile to some degree. States can cope with these unavoidable ups and downs by maintaining adequate rainy day funds. Preparing forecasts of spending and revenues that extend beyond one year would allow timely implementation of remedies. Attention to the growth potential and relative volatility of different state taxes is crucial to resolving the current fiscal crisis and maintaining adequate funding for state programs over the long term.

An adequate state tax structure must both raise sufficient revenues at a given point in time and grow each year. State taxes fund health care, education, public safety, transportation, and other important government services. State costs naturally grow from year to year regardless of a state's fiscal efficiency. State governments and agencies must offer wages competitive with the private sector to attract and retain workers. Health care costs are a major component of state and local budgets and have been rising faster than general inflation. Demographic factors—such as an aging population—also play a role in the growth of government expenditures.

For these reasons, tax revenues must grow each year to fund state services on an ongoing basis without frequent tax rate increases or program cutbacks. When the natural rate of revenue growth falls short of the rate of spending growth—the situation in most states—a state faces a structural deficit. These structural problems are not as obvious in today's economy because states have been overwhelmed by the impact of the cyclical decline of state revenues, but these problems have not gone away.

In their paper, Professors Cornia and Nelson address the important and timely topic of growth and volatility in state tax systems. These issues are relevant both to the resolution of structural deficits and to the states' ability to recover from the current fiscal crisis.

State revenues will not recover from their current depressed level until employment returns to normal levels. That is expected to take a number of years after the end of the recession. We estimate that states are facing budget shortfalls in fiscal year 2011 just as large as those they closed in fiscal year 2010 and that these problems will continue into 2012 and beyond. Unfortunately, states will have fewer resources to address them. Much of the federal aid provided through the American Recovery and Restoration Act will end in 2010, and most states have already drawn down their rainy day funds and used other short-term measures.

To continue to fund ongoing programs, states will need to replace one-time revenues, such as Recovery Act dollars and reserve funds, as well as pay for ordinary growth in spending. As a result, states will need not only restoration of normal

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McNichol

revenue growth but also above-average growth over the next few years to even approach pre-recession revenue levels. Moreover, once this is achieved, most states will continue to face structural budget deficits.

Over the next few years, states are likely to consider changes to their tax systems to produce growth needed to maintain services. At the same time, recent experience will make them wary of introducing too much volatility. But as Cornia and Nelson suggest, a little volatility can be a good thing if it is the price paid for growth. Careful study of the relative volatility and growth of specific types of taxes will help states make informed decisions about these trade-offs.

Cornia and Nelson make an important contribution to the literature on the subject, but they also demonstrate some of the problems inherent in this kind of analysis. Their paper initially discusses the relationship between economic growth and state revenue growth. They find that, in aggregate, state revenues have grown at about the same rate as state economies over the past two decades. In normal times, the rate of economic growth has been shown to be a useful proxy for the natural rate of growth in the total cost of state programs. When revenues grow naturally at the same rate as the economy, a state generates enough funds to cover the costs of its budget each year. The current state fiscal crisis is not the result of a run-up in state spending prior to the recession—state spending has not expanded as a share of the economy. Rather, it is the result of a dramatic decline in state revenues due to the recession.

On the face of it, this look at state revenue growth relative to economic growth seems to show that state tax collections have grown at an appropriate rate to meet the ongoing costs of providing state services. In other words, it appears that the natural growth rate of state taxes is the same as the natural growth rate of state costs. However, this apparent match was actually the result of multiple changes in state tax rates—often increases—and changes to tax bases that occurred during the period studied. These affected both the growth rates and the volatility of state taxes.

Cornia and Nelson go on to examine the growth rates and volatility of different state taxes. This

information can assist policymakers as they make decisions about future increases and decreases in state taxes. But policymakers need to proceed with caution when using analysis such as this to determine the best mix of taxes to provide adequate growth for the future as well as adequate funding now.

For example, a simple look at the growth rates over time leads to the impression that cigarette taxes grow at about the same rate as other state taxes (Figure 1). It is true that the median percentage growth in total cigarette tax collections is about average compared with growth in other taxes over the two decades studied. However, this is misleading because that “average” growth resulted from the relative willingness of states to raise cigarette tax rates in recent years rather than from the underlying design of the tax. In the absence of regular rate increases, cigarette tax collections tend to decline rather than grow over time. The base of this tax—tobacco consumption—has been declining. According to the U.S. Department of Agriculture, cigarette consumption has been declining by about 2 percent per year since 1990.¹

The problem of not accounting for rate and base changes exists to a lesser degree with other major state and local taxes. For example, state sales tax rates increased on average over the period. At the same time, the number of goods and services in the base subject to the sales tax expanded in some states and decreased in others.

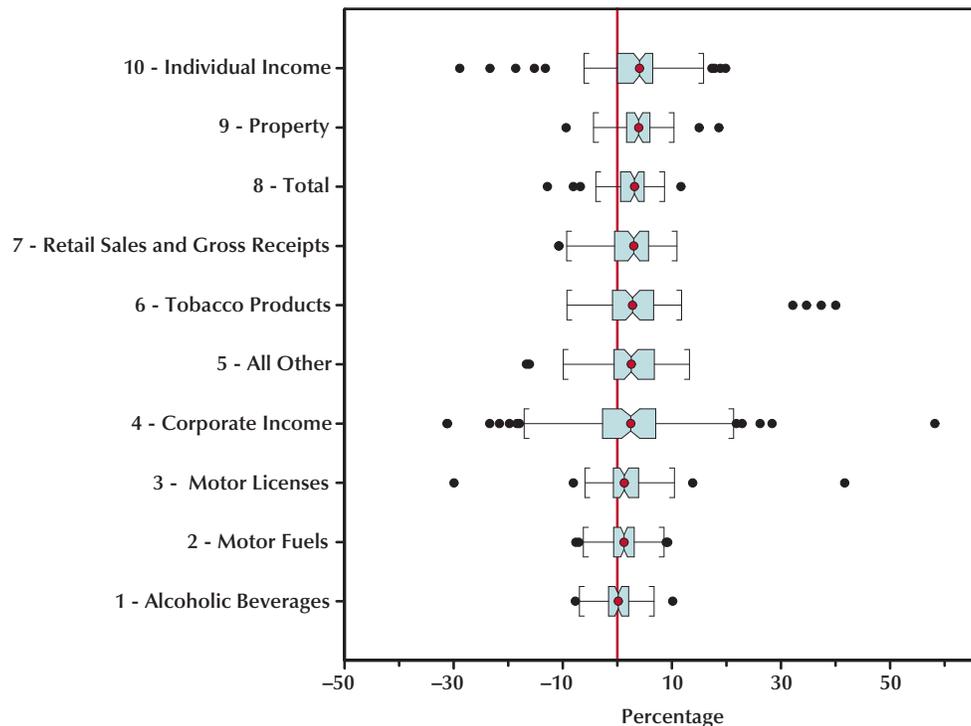
It is difficult to find a comprehensive national source of data for all 50 states that would allow for complete exclusion of the effects of rate and base changes. But this information is needed to determine the underlying growth rate of different types of taxes.

The effect of rate and base changes can be dramatic. For example, the state of Connecticut publishes historical information on annual state tax collections adjusted for rate and base changes. As shown in Figure 2, between 1989 and 2008, tobacco tax collections grew by 7.9 percent per year as a result of large rate increases in the past two decades. But when these rate increases were factored out, Connecticut’s tobacco tax collections declined by 2.8 percent. Motor fuel and alcohol

¹ Economic Research Service (2006 and 2007).

Figure 1

State and Local Taxes: Year-Over-Year Growth Rates in Quarterly Revenues Ranked by Median of Percentage Change (1989-2009)



NOTE: This is Figure 6A in Cornia and Nelson (2010).

SOURCE: Census Bureau Quarterly State and Local Government Tax Revenue.

taxes show a similar pattern. To a lesser extent, Connecticut's personal income tax growth rates are overstated and sales tax rates are understated because Connecticut raised its income tax rates and lowered its sales tax rates.²

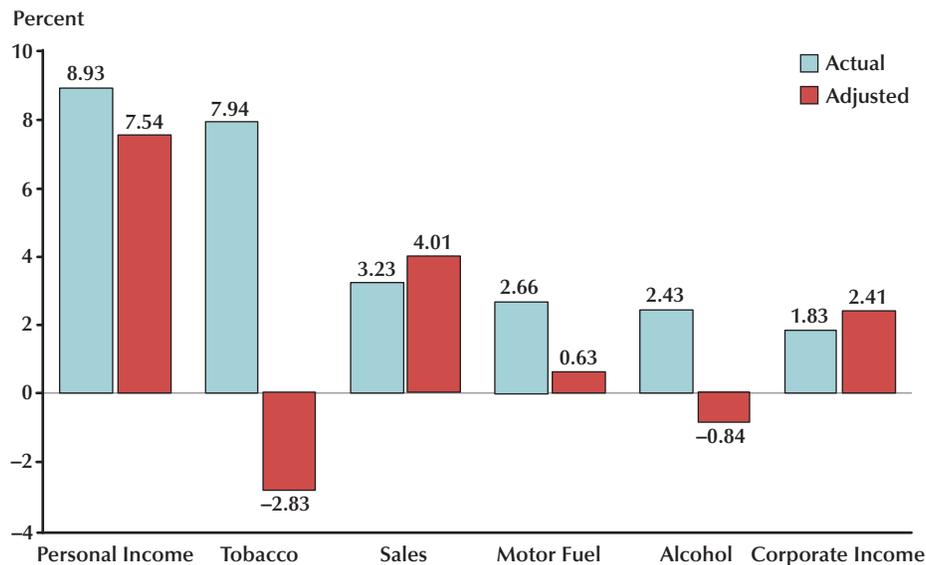
The Cornia and Nelson paper uses Census data—really the only source with comparable state-by-state numbers over time—but the limitations of this data source should be acknowledged. Policymakers who rely on this type of analysis to inform tax-change deliberations need to keep in mind that this is a holistic view of changes in tax collections that includes policy changes and not only natural growth.

² Note that the period covered for the income tax is from 1992, the inception of the tax, to 2008.

Failing to account for rate and base changes makes this analysis less useful to states. A state that decided to raise revenue by doubling its cigarette tax, for example, should expect future revenue from this source to decline, not grow significantly, as it does in Cornia and Nelson's analysis of unadjusted tax collections, unless it also planned to implement regular and large rate increases.

Although it would be difficult to adjust a lengthy period of yearly data for each state, it would be possible to note rate changes—and, in some cases, base changes—to allow policymakers to see how much of the growth and volatility results from policy rather than the characteristics of the tax.

For example, Table 1 summarizes changes to cigarette, motor vehicle, and sales tax rates over the past two decades. As noted, states raised ciga-

Figure 2**Connecticut Tax Collections (1989 to 2008)**

SOURCE: Connecticut Office of Fiscal Analysis.

Table 1**Selected Median State Tax Rates**

State tax rates	1989 Median	2009 Median
Cigarettes (\$ per pack)	0.20	1.15
Gasoline (\$ per gallon)	0.16	0.24
General (%)	5.00	5.75

SOURCE: Advisory Commission on Intergovernmental Relations (1991); Commerce Clearing House (2010).

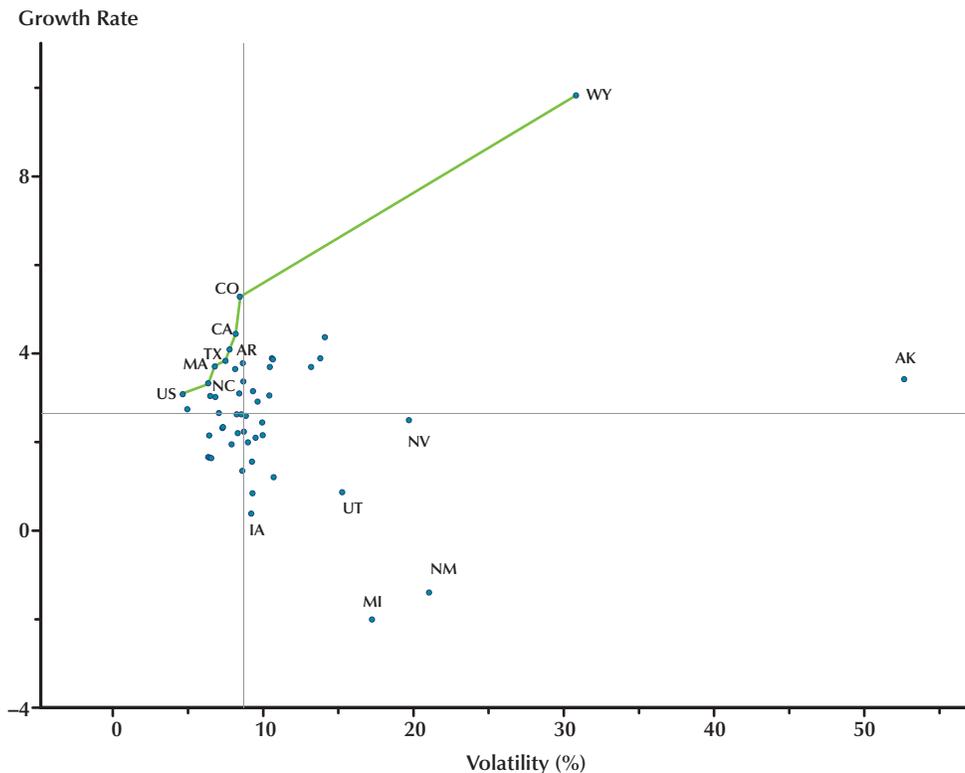
rette tax rates significantly over this period. The median cigarette tax rate increased from 20 cents per pack in 1989 to \$1.15 per pack in 2009. The median gasoline tax rate increased by almost 50 percent.

The median state sales tax rate has also grown over this period. As a result, care must be taken in interpreting the results. First, the growth of the sales tax is likely overstated because it captures the effect of rate increases as well as changes in consumption and inflation. In addition, the relative

volatility of the tax is likely understated because rate and base changes may have offset declines in collections resulting from economic downturns. The opposite is likely true for personal income taxes, which were cut significantly during the extended periods of economic growth of the 1990s and 2000s. Its growth rate is likely overstated. But the volatility of the income tax may also be understated, as states cut the income tax when it was growing rapidly and thus dampened some of the tax's volatility.

Figure 3

The Growth-and-Volatility Efficiency Frontier for State Tax Revenues: Year-Over-Year Percentage Change in Quarterly Total State Tax Receipts (1995-2009)



NOTE: This is Figure 10 in Cornia and Nelson (2010).

SOURCE: Census Bureau Quarterly State and Local Government Tax Revenue.

In a 2006 paper, Bruce, Fox, and Tuttle examined the question of the relative volatility of sales and income taxes using similar Census data. They performed regression analyses that included adjustments for the sales tax rate and controls for income tax rate changes. They found that the growth of the personal income tax relative to the economy was significantly higher than that of the sales tax and that the long-run volatility of the income tax was about double that of the sales tax. However, they also found that the short-run volatility of the sales tax was not uniformly greater than that of the income tax. The experience of the current recession, which saw deep declines in sales tax collections, bears out this result.

But even with the limitations discussed above, the Cornia and Nelson analysis illustrates the growth and volatility dilemma for states. Ideally, a state would adopt a tax structure that (i) grows well to allow funding of services on an ongoing basis and (ii) is relatively stable (that is, has low volatility) to allow for planning. As shown in Figure 3, when all factors, including the relative willingness and ability to make tax policy changes, are included, only one in four states achieves this combination of average or above-average growth and low volatility.

Cornia and Nelson's comparison of Tennessee and Oregon also illustrates this point. Oregon, which relies heavily on the income tax and has no

McNichol

general sales tax, shows both higher growth and higher volatility than Tennessee, which relies on the sales tax and has no income tax. In this case, the comparison would be even starker if policy changes were factored out. Over the period shown, Tennessee increased its sales tax rate, which boosted its growth. Oregon, on the other hand, had a provision called the “kicker” that resulted in automatic income tax cuts, which reduced both volatility and growth.

As state policymakers deal with the aftermath of recession and plan for the future, they will need to balance the desire for a highly stable tax system with the need for new revenues. Robust—in fact, above-average—growth will be needed to restore programs to pre-recession levels, and the income tax is the major state revenue source that can supply that growth. Some specific changes can increase that growth, such as making the rate structure more progressive or taxing capital gains. The more progressive the tax, the higher the growth will be when the economy is growing, but volatility may also increase. That presents a problem because states must balance their budgets every year, not just on average over a number of years.

The solution to this dilemma lies in other policies. First, some of the volatility of the income tax could be offset by redesigning other state taxes such as the sales tax. For example, a broader sales

tax base likely would grow rather than decline with the economy and be more stable. (It would be interesting to see research that factors in the effect of such policy changes on volatility.)

Second, adequate rainy day funds and other reserves can help states better manage revenue systems that fluctuate with the economy: In good times, states can reserve revenues to draw upon when economic growth—and thus revenue growth—slows.

Third, states can diversify their tax systems by relying on a mix of taxes rather than one tax. A disproportionate reliance on one tax can leave a state more vulnerable to economic changes. For example, sales tax collections declined significantly at the start of the recession. Later, income tax collections dropped sharply but sales tax collections began to rebound as consumers started spending. A state that depends almost exclusively on one or the other tax would not have the benefit of this balance.

Finally, the overall lesson for policymakers is to keep resources in mind when planning for the future and to allow as much transparency as possible when assessing the impact of the existing tax structure on future decisions. One way to do this is to prepare and publish forecasts of revenues and spending beyond the upcoming budget year.

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States in Fiscal Distress

Robert P. Inman

The 2007-10 recession has imposed significant fiscal hardships on state and local governments. The result has been state budget deficits and the need to increase state taxes, cut spending, and withdraw funds from state “rainy day” accounts. The primary cause of state budget “gaps” has been the rise in the level of state unemployment. There is no evidence that these gaps are related to state political institutions, a state’s prior receipt of federal funding, or possibly favored access to key congressional budget committees. The federal government has responded to these gaps with the passage of the American Recovery and Reinvestment Act (ARRA) of 2009 to aid states in fiscal distress and provide economic stimulus. Though intended as insurance for fiscal distress, ARRA covers at most \$0.23 of each dollar of a state’s recession-induced budget gap. These funds are provided through a large per capita payment to each state, independent of any level of state deficit. AARA was also intended as targeted assistance for stimulating local economies, but its funding is uncorrelated with state unemployment rates. ARRA funding appears to be decided by congressional politics, given Congress’s desire to pass a major spending and tax relief package as quickly as possible. States are important “agents” for federal macroeconomic policy, but agents with their own needs and objectives. (JEL H3, H6, H7)

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States and their subsidiaries, local governments, have long been the foundation of public finance in the United States, a fact no less true today than at the country’s founding. Today state and local governments account for over 70 percent of the nation’s spending on nondefense public goods and services. As a matter of public policy, we have chosen to decentralize the provision of governmental services—and for good reasons. State and local governments offer significant choices to our mobile residents and businesses for the provision and levels of services. Choices encourage states to compete for residents and firms, which leads to improved fiscal performance and a better matching of service provision to the wants and needs of residents and

firms. The availability of many alternative providers allows successful program innovations to be copied by other states. Finally, with mobile residents, government repression of individual political and civil rights becomes more difficult. For each of these reasons, state governments can play a central role in ensuring a prosperous and democratic society.¹

States today, however, are under significant fiscal stress. The recent deep economic recession has both reduced state revenues and increased state expenditures, particularly for Medicaid outlays for state poverty populations. The end result has been large state deficits requiring employee layoffs

¹ These lessons from U.S. history appear to be generalizable to other societies and economies as well. See Inman (2007).

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and furloughs, program cuts, and tax increases to restore balanced budgets. State program cuts have been concentrated in the two biggest spending categories: (i) state aid to local education and (ii) transfers and services for lower-income families. In February 2009, 44 states reported that their anticipated balanced budgets for fiscal year (FY) 2009 had turned to deficits. Only states with significant severance taxes on state natural resources—Montana, Nebraska, North Dakota, Texas, West Virginia, and Wyoming—showed zero expected deficits for the remainder of their fiscal year. These trends have continued into FY 2010. Revenues are still expected to fall below state expenditures, and only through a variety of budget gimmicks, such as asset sales, pension underfundings, and dipping into “off-budget” funds, will the troubled states be able to balance their budgets.²

It is no surprise then that states as a group turned to Congress for relief. Congress responded with the passage of the American Recovery and Reinvestment Act (ARRA) in February 2009. As part of that legislation, the federal government provided over \$223 billion for three years of fiscal relief for state and local governments, divided about equally between (i) general fiscal relief for education, Medicaid, and welfare expenditures and (ii) program- and project-specific transfers meant to stimulate the economy.

This paper provides a preliminary evaluation of the ARRA’s relief for states in fiscal distress. It does so against a backdrop of how state finances work best in “normal” times. I reach two conclusions. First, although ARRA did provide significant aggregate fiscal relief to all state governments, the allocation of the program’s funds provided at best weak relief for those states in greatest fiscal distress. Only \$0.23 of each ARRA dollar was explicitly targeted to closing state mid-year deficit gaps. The remaining \$0.77 of each ARRA dollar increased funding of state services generally or aided new programs favored by Congress and the Obama

administration. Congressional politics played a significant role in allocating these new programmatic dollars. Second, the analysis of state budgeting in normal times suggests a better way to manage state finances in times of fiscal distress—that is, to encourage each state to maintain a budget-stabilization, or “rainy day,” fund equal to at least 10 percent of state expenditures. The best way to encourage such behavior is for Congress to commit to no federal bailouts of states in fiscal distress. Congress first did so in response to the state fiscal crises of the 1840s and has continued this tradition down to President Gerald Ford’s emphatic “No” to the bailout requests of New York City and New York State during their fiscal crises of 1974.³ Today’s crises in state finances provide another opportunity to reconfirm this commitment.

EFFICIENT STATE BUDGETING IN NORMAL TIMES

State governments perform two essential functions in our public economy. First, they provide statewide public services not efficiently provided by the many local governments. These are services that display significant economies of scale in production or that correct for between-community economic externalities—services such as higher education; construction, maintenance, and safety of public highways; prisons and courts; and the protection of water and air quality. Second, states redistribute incomes between residents and provide for a minimally acceptable level of meritorious local services. These redistributive activities include income protection, training, and job placement; the provision of health care services for children and lower-income families; and the guarantee, through intergovernmental transfers to schools, of a minimally acceptable level of K-12 public education for all children.

To ensure that state residents pay the marginal costs of state services, state taxes should be resident- or destination-based taxation. Resident-based taxation taxes factors of production based on where

² For an excellent description of the current condition of state finances and budget strategies for dealing with states’ fiscal crises, see the National Governors Association (NGA) and the National Association of State Budget Officers (NASBO) (June 2009, particularly Tables A-2, A-3, A-5a, and A-5b and their notes, which provide the details of how states have chosen to close their fiscal gaps).

³ See Inman (2003) and Wallis and Kim (2005) for a review of this history and Shefter (1992) for a valuable review of the finance and politics of the New York fiscal crises.

the factors “live,” not where they work, and taxes consumption based on the location of the consumer. The alternative is source-, or origin-, based taxation, which taxes factors of production by where they work and taxes consumption at the point of purchase. Source-based taxation may allow a share of the tax burden to shift onto nonresident labor and owners of productive capital and nonresident consumers of goods and services produced within the state. Source-based taxation, however, has two adverse consequences for economic efficiency. First, it discourages the efficient location of economic inputs.⁴ Second, because nonresidents pay a share of the taxes used to finance the marginal costs of state services, residents or their elected officials may find it advantageous to overprovide subsidized state services.⁵ For economic efficiency, then, the preferred structure of state taxation is resident based—ideally resident income, property, and consumption taxation.

With efficient state finances in “normal” times, states should be allowed to use long-term debt to manage large and unexpected expenditures that arise during the fiscal year. Without the ability to borrow to cover such expenditures, states would be forced to raise tax rates significantly. Firms and households typically react to large increases in their tax rates by making a disproportionately large reduction in valued private sector activities, such as investment, savings, or work effort. These efficiency losses, known as the excess burden of taxation, grow exponentially with the state tax rate. The use of government debt to pay for large one-time expenditures allows the government to increase tax rates only slightly and to then hold tax rates stable over the period of debt repayment. This fiscal strategy is called “tax smoothing” and helps to minimize the efficiency losses of state taxation.⁶ Large increases in state expenditures may occur for two reasons: capital outlays for public infrastructure or relief spending to offset losses from natural disasters or deep recessions. Debt financing for

either reason is an important component of efficient state financing.

The aim of efficient state government finances is to have each state set its level of public services or transfers so that the marginal benefits of the public dollar just spent equal the marginal costs of financing that dollar. Unfortunately, states may not always choose an efficient level of public services or transfers, adopt efficient tax instruments, or use long-term debt appropriately. In these cases, federal government intervention may be necessary, including the following measures.

First, state spending must allow for all interstate spillovers, which could be relieved by federal financial assistance. Service spillovers are likely to be most pronounced for states that redistribute resident incomes or provide public goods that directly benefit nonresidents. States that engage in higher-than-average income redistribution attract lower-income residents from other states and drive out upper-income residents from their own. Such mobility of residents discourages states from providing what may otherwise be desired income transfers. This fiscal externality could be solved by federal intergovernmental transfers to states in proportion to the redistributive benefits created for residents outside the state or for the added costs borne because of the exit of the mobile tax base from within the state.⁷ Federally funded intergovernmental transfers are appropriate, too, for state-provided public goods (e.g., major interstate highways, intercity airports, and infrastructure that protects air and water quality) that significantly benefit residents outside the state. The preferred form of such transfers is a price subsidy or “matching” grant equal to the share of all benefits enjoyed by nonresidents of the state.⁸

Second, federal policies could help states achieve more-efficient taxation. Although resident taxation is an efficient way to tax for state services, source-based taxation may be preferred by state residents or their elected officials. Source-based taxation is significantly easier to administer. Taxes on labor income can be collected by a withholding tax administered by firms located within the state.

⁴ See Wildasin (1989) and Gordon (1983).

⁵ See Inman and Rubinfeld (1996).

⁶ See Barro (1979).

⁷ See Wildasin (2000).

⁸ See Inman (2002).

Capital income taxes, once income is apportioned across multiple locations, can also be collected directly from the firms within the state. Finally, sales taxes can be collected at the point of sale rather than requiring residents to keep records of out-of-state purchases. In addition to ease of administration, all revenues from source-based taxation collected from nonresidents act as a subsidy to residents for their purchase of state public services. It is not surprising, then, that state officials adopt source-based rather than resident-based taxation. Fortunately, certain federal policies can solve this problem while still leaving state governments full control over their choice of tax rates. State-resident income and sales taxation could be “piggybacked” onto the federal income tax or a federal sales, value-added, or consumption tax. The state would select a tax rate and the federal government would collect the revenues from a shared national tax base, say, resident income or consumption, as reported by residents of the state. Because of the high mobility of capital and the difficulty of apportioning fixed costs across locations, capital taxation should be administered and the rates set solely by the central government.⁹

Third, the federal government may be needed to monitor states’ use of long-term debt. The problem arises when states use long-term debt to finance current-year government services. Unless current and future residents, or future factors of production if taxation is source based, fully understand the extent of such deficit financing for current services, market and public sector inefficiencies will result. Market inefficiencies occur because future taxes must be increased, even though there is no future public asset (in the case of infrastructure) or income insurance program (in the case of disasters) whose benefits compensate for the tax increase. This discourages the location of new private capital and/or labor in the state, even if these factors’ pretax marginal productivity would be higher than in their next-best location. Public sector inefficiencies occur

⁹ See Wildasin (1989), who suggests that perhaps some of the proceeds of a national capital tax could be allocated back to states through intergovernmental transfers for support of productive public infrastructure complementary to private capital. There is an extensive literature on the design of such tax and transfer schemes; see Krellove (1992) for the theory and Rivlin (1992, Chap. 8) for an application to U.S. federalism.

because long-term debt used to pay for current services creates a subsidy of those services if that debt is finally repaid by future residents.

There is a marketplace solution to these deficit-induced inefficiencies, however. If future debt obligations are known to all future residents and firms and if those residents and firms have equally attractive locations in other states—that is, competitive locations are in elastic supply—then any taxes to repay long-term debt used to finance prior services must be “rebated” to all new residents and firms before they will locate in the high-deficit state.¹⁰ This can be done for new residents by either raising resident wages or by lowering the price of land for housing. New firms will enter the state only if wages are lower or if land for production is priced lower. But in the end, the price of land will bear the full burden of paying for past deficits. Land and its valued attributes—mines, oil and gas, fertile farmland, beaches, sunshine, mountains, ports, or long-standing agglomeration economies—are the only factors unique to the state and the ones that cannot move to escape the tax.¹¹ In the end, the debt-induced tax for current services is shifted back onto the owners of location-specific assets in the form of lower rents and entrepreneurial profits. And this is as it should be, for it was these owners of the fixed assets who enjoyed the benefits of the deficit-financed services when they were first provided. With efficient private markets, therefore, those who first received benefits now pay for the benefits, just as efficient public finance requires.

The problem with the market solution to state deficit financing lies in discovering and credibly signaling the level of such debt-financed current-account fiscal deficits. State officials have at least four ways to conceal a deficit: (i) At the end of each fiscal year, state officials may reveal the deficit but then pass the shortfall to next year’s budget with a

¹⁰ An assumption of perfect elasticity of new capital to each state is certainly reasonable for capital. For evidence that residents and productive labor are also elastically supplied to states in the long run, see Blanchard and Katz (1992).

¹¹ See Mieszkowski (1972) and more recently Rangel (2005). In the “not too” long run there may also be fixed capital assets in place within the state, the most important of which is the existing housing stock. This fixed capital stock will also be depreciated by its share of the costs of long-term debt unmatched by compensating public benefits.

promise to repay in coming years. If the accumulated debts grows faster than state tax bases, eventually the rollover strategy will collapse and someone will need to cover the aggregated shortfalls.¹² (ii) Officials may fail to maintain local capital stocks and not record depreciation of those assets as a current expense. Unlike most machines, such government assets decay gradually, continue to provide services, but then may one day collapse. The fall of the Mississippi River bridge connecting the twin cities of Minneapolis and St. Paul, killing 13 persons and injuring another 145, is a tragic, but not uncommon, example. (iii) States may borrow money for new investments, but then spend those funds on a current service, relabeled perhaps as a “capital outlay.” (iv) States may underfund their workers’ defined-benefit pension plans. To ensure sufficient funds to pay workers’ promised annuities, state governments must make a contribution that, with accumulated interest, will pay the accumulated annuity from that year’s salary. If the government contributes less than the required payment, then the pension will be underfunded. Such underfundings are effectively a deficit created to pay part of the compensation of current public employees.¹³ Information about the level of local debt created by each borrowing strategy is the key to disciplining inefficient deficits.

But who will provide the information about these types of state deficits? It is unlikely that elected state officials seeking reelection will reveal the true level of state deficits since the deficit strategy gives the appearance of quality services at low tax rates. Future residents and firms might invest in collecting the needed information, but unless *all* potential buyers of state assets have this information it will be the uninformed buyer who offers the undiscounted price who buys the property. Informed buyers do avoid a potentially bad investment, but the cost of acquiring deficit information

must be borne by each individual buyer and may simply exceed the expected benefits of participating in the market. A “lemons” market may occur, where high-debt states discourage the efficient relocation of economic activity generally.¹⁴

Paradoxically perhaps, the only parties with an economic interest in providing credible market information are the current owners of assets in the state adopting the deficit strategy. Doing so provides a more-liquid market for their private assets and likely higher asset prices when they choose to sell. Importantly, since providing the information is a public good to all buyers, there are significant economies of scale from having the information provided by a single agent—perhaps a supervising agency of the state itself closely monitored by the state’s current asset owners. Further, since investing in a state often requires a long-term commitment, having the oversight agency signal a credible commitment to future deficit-free financing is also needed. Let’s call these asset owners “current homeowners,” the agency an “elected state supreme court,” and the commitment mechanism a “constitutionally based balanced-budget rule” (BBR). Bohn and Inman (1996) find that constitutionally based BBRs enforced by an independently elected state supreme court do in fact provide a significant check on elected state officials’ propensity to run current-account fiscal deficits. But lacking such a watchdog institution, states may abuse long-term debt financing.¹⁵

There is one more requirement for market discipline of state deficits to work—the federal government must not bail out a state when its accumulated deficits threaten state default. If the national government cannot politically resist the temptation to bail out troubled state governments because of their macroeconomic or political impor-

¹² This rollover strategy was the central cause of the fiscal crises in New York City in 1972, Philadelphia in 1990, the German states of Saarland and Bremen in 1994, São Paulo in 1996, Buenos Aires in 1996, and Washington, D.C., in 1997. These fiscal histories are described in Rodden, Eskeland, and Litvack (2003). Greece today is a victim of such fiscal misbehaviors.

¹³ See Inman (1982), who presents evidence that underfunded public pensions lead to higher worker wages and more public employees than would be observed if worker pensions were fully funded.

¹⁴ Without credible information about deficits, when bidding for property, uninformed buyers will always outbid informed buyers. Although informed buyers could share information, uninformed buyers are unlikely to believe it—they will fear that informed buyers will announce too high a deficit estimate in hopes of prompting uninformed buyers to make offers that are too low. Thus, informed buyers cannot win: Information is costly but does them no good. Information here is a public good and should be provided by the government.

¹⁵ Inman (1997) provides the formal political economy analysis of self-enforcing BBRs. At the moment, 10 of the 50 states have the institutional structure sufficient for a fully effective BBR. See Bohn and Inman (1996, Table 2) and Hou and Smith (2006).

tance—that is, that they are too big to fail—then political improvidence trumps market discipline. Knowing a bailout is available from the national government, states will shift the cost of state services onto national taxpayers in a beggar-thy-neighbor game of deficit financing for current spending.¹⁶ To qualify as too big to fail, a state financial default can either impose a large economic cost on the national economy (for example, a financial collapse, such as São Paulo’s financial default that threatened Brazil in 1996, or the Greek, Portuguese, or Spanish government debt that threatens the “federal” European Union today), impose a large loss on a particularly socially favored cohort (as New Orleans’s default did following Hurricane Katrina), or threaten a valued social resource not easily duplicated (as was the case for Washington, D.C., with its financial default in 1997). Having a federal government with the discipline to say “No” to a demand for a federal bailout is crucial for efficient state government finances.

Against the backdrop of these guidelines for efficient state budgeting, then, how do U.S. states do in normal times? For the sector as a whole, aggregate fiscal performance seems fine. States spend money on what they should, with federal intergovernmental assistance where appropriate. State taxes are largely residential. And most states have balanced budgets with small annual contributions to a budget stabilization fund for unforeseen shocks to the state economy.

For example, in FY 2006, the last pre-recession year, state spending for current services and transfers was \$4,430/person: \$1,725/person for state services, such as highway maintenance, courts and prisons, and protection of natural resources, and \$2,705/person for general transfers, such as welfare and Medicaid and school aid. State spending for new infrastructure was about \$340/person. States paid for these services and transfers largely with residential taxes: 25 percent from residential income taxes, 24 percent from general sales taxation, and 32 percent from resident user fees and “sin taxes.” Together these residential taxes and user fees totaled 7.2 percent of personal income.

¹⁶ This beggar-thy-neighbor fiscal game is described in Inman (2003) and then applied by others in country case studies in Rodden, Eskeland, and Litvack (2003).

The remaining share of state revenues were collected from businesses through business fees and a state corporate income tax. The state corporate income tax is the only significant source-based tax and contributed only 5 percent to aggregate state revenues in 2006. All capital spending by states is paid for through the issuance of long-term debt.¹⁷

Each year states have a significant gap between revenues from fees and taxes and current spending. Again, on average for FY 2006, state revenues covered \$3,236/person of the \$4,430/person in current spending. The resulting gap of \$1,194/person was more than covered by \$1,290/person in federal intergovernmental transfers. Those transfers (provided as grants) paid for income transfers, Medicaid, and related services for state residents in poverty (\$750/person), for interstate highway construction and maintenance within the state (\$110/person), and for a miscellaneous collection of targeted small programs of value to state residents (\$430/person).¹⁸ Together, individual state revenues plus federal aid equaled on average \$4,526/person, a bit more than enough to cover current spending. In 2006, the average state was able to run a current-account fiscal surplus equal to its own revenues plus federal aid (\$4,526/person) minus current spending (\$4,403/person) of \$123/person, or about 2 percent of current spending. In the aggregate, deficit financing has been under control. These state surpluses have been saved in fiscal stabilization, or rainy day, funds for future fiscal emergencies. As shown in column 5 of Table 1, by the end of FY 2006, states in the aggregate had accumulated over \$40 billion in total savings for future fiscal contingencies.

Against the guidelines for efficient state budgeting, there is much to recommend about this aggregate fiscal performance by U.S. states. In FY 2006, states were spending money on appropriate state functions, raising most of their money with

¹⁷ See U.S. Census Bureau (2009, Table 439). These figures and those for federal aid below are from the *2006 Census of Governments* and include all state spending and revenues.

¹⁸ Inman (1988) provides an evaluation of these many programs against the standards of good public finance. Not surprisingly, federal politics are an important determinant of the final allocation of federal dollars. We reach a similar conclusion, noted below, in our evaluation of the recent federal programs designed to help states during the current fiscal crisis.

Table 1**States Under Fiscal Stress: State General Funds (2009\$ billions)**

Fiscal year	State general funds				Overall fiscal balance
	Revenues	Expenditures	Balances*	Stabilization fund	
	(1)	(2)	(3)	(4)	(5)
2006	622.0	603.8	18.2	22.4	40.6
2007	671.3	673.2	-1.9	29.1	27.2
2008	669.3	684.7	-15.4	35.0	19.6
2009	638.4	670.0	-31.6	30.4	-1.2
2010 [†]	647.2	652.9	-5.7	28.8	23.1

NOTE: *The state balances reported here are the difference between state revenues in column 1 minus state expenditures in column 2. This measure differs from the “ending balance” reported in NGA and NASBO (June 2007, June 2008, June 2009, Tables A-1, A-2, and A-3) because it excludes all revenue “adjustments” and expenditure “adjustments.” Such adjustments typically include the reallocation of revenues and spending obligations from a variety of “off-budget” funds—for example, revenues from tobacco settlement funds, pension obligation bonds, interest payments from bond sinking funds, and transfers into the current budget from state rainy day funds. See NGA and NASBO (June 2007, June 2008, June 2009, Tables A-1, A-2, and A-3 notes.) Finally, California, Colorado, Delaware, Georgia, Massachusetts, Minnesota, New Jersey, New Mexico, New York, and South Carolina report their state stabilization funds as part of each fiscal year’s ending balance. Therefore, to provide an end-of-fiscal-year balance for all states, column 5 is the sum of columns 3 and 4. [†]The results for FY 2010 are projected numbers as of June 2009.

SOURCE: NGA and NASBO (June 2007, June 2008, June 2009, Tables A-1, A-2, and A-3).

efficient resident-based taxes, and running small current-account fiscal surpluses. For the most part, the federal government provides assistance for state services with arguably significant interstate spillovers and does so with appropriate price-based subsidies. By most measures, states were fulfilling their assigned role in our federal system of public finance in FY 2006.

But those were normal times. Today state governments are in deep fiscal distress. The question now arises: Should the guidelines for good state financing be relaxed when states face the threat of deep service cuts or large tax increases? If so, how does state assistance provided by the ARRA fit into such revised guidelines?

UNDERSTANDING TODAY’S FISCAL CRISIS

In January 2006, the national unemployment rate was 4.7 percent. By February 2009, the rate had more than doubled to 9.5 percent and the U.S. economy was in the midst of its deepest recession since the 1930s. The impact of the recession on

state budgets has been significant. By the middle of FY 2009, 44 states were facing significant fiscal deficits totaling over \$78 billion, or about \$260/person. Mid-year deficits as a share of budgeted spending for FY 2009 equaled 12 percent. Only those states with significant “severance” taxes on their state production of oil, gas, and coal were immune to the deficit pressures. Since most state constitutions preclude making changes to tax rates during the fiscal year, these looming deficits meant significant cuts in state services. These fiscal pressures have continued into FY 2010. Was the recession alone to blame, or were there inherent weaknesses within the fiscal structure of state financing that only a deep recession could expose? Knowing the answer to this question will help us evaluate the policy responses of states, and ultimately the national government, to this crisis.

Table 1 summarizes the aggregate fiscal performance of the general fund for state governments since FY 2006.¹⁹ In FY 2006, general funds were

¹⁹ It should be noted that the levels of funding reported in Table 1 are limited to state general funds, whereas the level of funding reported in the “Efficient State Budgeting in Normal Times” section for FY 2006 includes all current-account spending.

comfortably in balance. All state revenues—including aid from the federal government—exceeded state spending by the positive balance of \$18.2 billion (Table 1, column 3). This balance can be allocated to a variety of uses in state “capital accounts,” such as paying down long-term debt, investing in capital improvements, or adding to stabilization (rainy day) funds. Some states adopted a variation of the savings strategy by “rolling over” the surplus from FY 2006 into the new budget planned for FY 2007.²⁰ The aggregate fiscal position of all state governments at the end of FY 2006 is the sum of their surpluses at the end of that year, \$18.2 billion, plus the accumulated savings from prior years now in their stabilization funds, \$22.4 billion (Table 1, column 4). In FY 2006, the total fiscal balance for states was \$40.6 billion, or \$136/person (Table 1, column 5).

The recession officially began in December 2007, but states did not begin to feel its full impact on overall fiscal balances until FY 2008. FY 2007 ended with budgets effectively in balance. There was a small aggregate deficit of \$1.9 billion (Table 1, column 3) that was more than covered by accumulated prior surpluses of \$29.1 billion in state stabilization funds (Table 1, column 4). By the end of FY 2008, however, the national unemployment rate had risen to 5.5 percent (the S&P 500 index had fallen from its peak of 1,549 in October 2007 to 1,280 by June 2008). States were beginning to feel significant pressure on their budgets. State revenues fell slightly from FY 2007 (–\$2 billion), but state spending rose by \$11.5 billion, particularly state spending for redistributive services. The net effect was to increase annual state deficits by \$13.5 billion, from –\$1.9 billion in FY 2007 to a more significant –\$15.4 billion by the end of FY 2008 (Table 1, column 3). Fortunately, state stabilization funds of \$35 billion were still sufficient to cover this gap and the overall fiscal balance for all states was \$19.6 billion (Table 1, column 5).

Not so by the end of FY 2009. States had begun to make significant spending adjustments in anticipation of continued falling revenues, but those

²⁰ This is simply an accounting step. Rolled-over surplus is placed in an interest-bearing account until it is spent in the next fiscal year, just as the state would do if the funds were placed in a separate stabilization fund. The possible virtue of an explicit stabilization fund is its transparency to citizens.

adjustments were not enough to prevent an almost doubling of the deficit of general funds. From FY 2008 to the end of FY 2009, aggregate state revenues fell by \$30.9 billion (Table 1, column 1), but state spending was reduced by only \$14.7 billion (Table 1, column 2). The net effect was to increase the aggregate deficit, from –\$15.4 billion at the end of FY 2008 to –\$31.6 billion at the end of FY 2009 (Table 1, column 3). This deficit fully exhausted the \$30.4 billion of accumulated savings in the state stabilization funds (Table 1, column 4), leaving an aggregate deficit of –\$1.2 billion.²¹ Going forward into FY 2010, states are planning for continued spending cuts and increases in state revenues. Still, for FY 2010, these adjustments will leave a planned general fund deficit of \$5.7 billion for all states.²²

Table 2 seeks likely correlates in state economies, budgeting, and/or politics that might help explain the large FY 2009 deficits. The dependent variable is the reported mid-year anticipated deficits in state budgets as of February 2009, called state budget gaps. This measure removes the mid-year adjustments to spending and revenues that states were able to make before the end of FY 2009 and therefore provides an estimate of the “structural” gap created by the fiscal shock of the recession.²³

Column 1 of Table 2 reports the partial correlations of attributes of state economies with the size of each state’s mid-year budget gap.²⁴ The most important correlate with the state budget gap is

²¹ See the boxed insert.

²² Note that states anticipate an aggregate level of 2010 state stabilization funds of \$28.8 billion! But, from where? The previous year shows an overall balance of –\$1.2 billion, so it cannot be from prior savings. And they are estimating revenues will be less than spending for FY 2010. There must be an “outside source” of money that states anticipate that is not included in their usual revenue projections. Could it be from one-time federal assistance through the ARRA of 2009? The Act plans to allocate \$90 to \$110 billion to states over FYs 2009 and 2010. It appears states plan to allocate approximately \$28.8 billion of those funds to replenishing their rainy day funds, suggesting that about \$0.30 of every ARRA dollar will be saved for a later fiscal crisis.

²³ The mid-year adjustments were significant. The reported aggregate budget gaps as of February 2009 averaged –\$78.6 billion, or –\$257/person. By the end of FY 2009, the aggregate deficit was –\$31.6 billion (see Table 1, column 5). States were able to trim their mid-year anticipated deficits by more than half.

²⁴ Since the results here are for a one-year cross-sectional regression of all 50 states, one needs to be cautious about using the word “causal.” I repeated the analysis in Table 2 omitting California and then Alaska and Texas and the results are nearly the same.

Table 2**Determinants of 2009 State Budget Gaps**

Average budget gap = \$257/person [SD = 233]	Budget gap (1)	Budget gap (2)	Budget gap (3)	Budget gap (4)	Budget gap (5)	Budget gap (6)
Constant	3.03 (113)	-131.2 (155.8)	190.9 (179.5)	-290.02 (202.3)	-29.06 (214.9)	-183.5 (131.8)
State unemployment February 2009 [SD = 2.03]	55.61 (14.60)*	45.09 (14.67)*	38.68 (18.18)*	48.70 (15.50)*	41.51 (15.66)*	44.81 (14.56)*
State population [SD = 6,672]	0.005 (0.004)	0.010 (0.004)*	0.008 (0.005)	0.010 (0.005)*	0.010 (0.005)*	0.010 (0.004)*
Percent manufacturing [SD = 0.065]	-1,599 (422.7)*	-883.3 (500.7)*	-1,353.4 (532.4)*	-1,126.1 (504.8)*	-901.3 (496.3)*	-977.1 (475.5)*
State budget 2005 [SD = \$1,685]	—	0.045 (0.019)*	—	0.092 (0.044)*	0.039 (0.029)	0.046 (0.019)*
Share of budget, Medicaid 2005	—	-294.0 (459.9)	—	—	—	—
Federal aid 2005	—	—	-0.076 (0.095)	—	—	—
Cash/securities 2005	—	—	11.30 (22.06)	—	—	—
Senate chairman	—	—	-56.51 (75.81)	—	—	—
CV, state revenues 2005	—	—	—	-387.4 (1,910)	—	—
CV, state expenditures 2005	—	—	—	213.1 (2,067)	—	—
State Senate seats	—	—	—	—	-1.53 (2.73)	—
State House seats	—	—	—	—	-0.132 (0.500)	—
Democratic governor	—	—	—	—	-69.36 (54.65)	—
R ² (Adj)	0.35	0.40	0.27	0.31	0.29	0.41

NOTE: *Significant at 5 percent or lower. Standard errors are in parentheses. SD, standard deviation. CV, coefficient of variation. All regressions contain 50 state observations. The variable "Senate chairman" = 1 if a particular state's senator holds either the chairmanship or is the ranking minority member of one of the following Senate fiscal committees: Appropriations, Banking and Urban Affairs, Budget, Commerce and Transportation, Environment and Public Works, or Finance.

LOOKING BEHIND THE AGGREGATE DEFICIT

The aggregate deficit for all states reached **−\$1.2 billion in FY 2009**. This aggregate total conceals a deeper and wider problem, however. In the aggregates are the states with zero or small deficits in FY 2009, in particular, the resource-rich states of Alaska, Montana, Nebraska, North Dakota, Texas, West Virginia, and Wyoming. Computation of column 5 of Table 1 for all states *excluding* Alaska and Texas reveals that at the end of FY 2009 the other 48 states had a deficit in their general funds of $−\$30.6$ billion and accumulated savings in their stabilization funds of only $\$16.9$ billion. Thus, the remaining 48 states had an overall fiscal balance of $−\$13.7$ billion, or about $−\$50$ /person.

It is reasonable to ask: How were these states able to cover the remaining $\$13.7$ billion in state spending? The answer has been to sell state assets, move monies from state funds such as the Tobacco Settlement Fund that had been earmarked for future spending, and to play the game of allocating May and June 2009 tax revenues committed to FY 2010 to pay for FY 2009 spending. Interestingly, the planned level of the state stabilization funds at the end of FY 2010 are still significantly positive, at $\$28.8$ billion, even though FY 2010 shows an anticipated general funds deficit of $−\$5.7$ billion. How can that be? The answer is that states did not fully exhaust their available FY 2009 stabilization funds to cover their FY 2009 deficits. In fact, they used only $\$1.6$ billion for that purpose (FY 2009 Fund $−$ FY 2010 Fund = $\$30.4B - \$28.8B$; Table 1, column 7). This means that most of the FY 2009 deficit had to be covered by reallocating funds not included in general fund accounting. How this could be done is detailed in NGA and NASBO (June 2009, Table A-2 notes).

Finally, California is always worthy of a special look. Its FY 2009 general fund deficit was $−\$4.7$ billion. The state had accumulated $\$2.3$ billion in prior general fund savings—California uses the rollover approach to account for state savings—for a net end-of-FY 2009 position of $−\$2.4$ billion, or $−\$66$ /person (NGA and NASBO, June 2009, Table A-2). Interesting, too, is that California is the one state with significant deficits that did not detail in NGA and NASBO (June 2009, Table A-2) how they planned to fill their revenue gap from nongeneral fund sources.

the state unemployment rate as of February 2009. The mean unemployment rate is 8 percent, with a standard deviation (SD) of roughly 2 percent within the sample. States with an unemployment rate 1 SD higher than average (10 percent) will have a budget gap that is $\$222$ /person more than a comparable state with an unemployment rate 1 SD lower than average (6 percent): $\text{unemployment} \times 55.61 = 4.0 \times 55.61 = \222.44 /person. States with larger populations also have a larger per capita deficit gap. Interestingly, it is not the states with larger manufacturing sectors that have the biggest budget gaps; the percent of state workers in manufacturing had a negative effect on anticipated state deficits.

Columns 2 to 4 of Table 2 add state fiscal variables to the analysis to explore the possible impact

of the structure of state budgeting on the FY 2009 budget gap. All fiscal variables are from FY 2005, though measured in FY 2009 dollars. The size of the aggregate state budget in FY 2005 is important, but the share of that budget allocated to the major redistribution program—Medicaid—has no significant effect on the budget gap (Table 2, column 2). There is no evidence that state expectations of “outside” funding encouraged a larger budget gap in FY 2009. Neither federal aid in FY 2005, large holdings of cash and securities in a rainy day fund in FY 2005, nor having a Senate budgetary chairman from your state is correlated with the “surprise” deficits of FY 2009 (Table 2, column 3).

Column 4 of Table 2 reports test results for the general presence of “California Behavior.” Over the past 10 years, California budgets have relied

heavily on capital gains taxation for the financing of state services and have increased state spending with increases in these tax revenues. Unfortunately, as revenues have declined, the state legislature has been unable to agree on comparable cuts in state spending. The result has been large state deficits during economic downturns.²⁵ Perhaps the use of high-variance revenues and the adoption of high-variance spending programs leads, as it has in California, to larger budget gaps. Column 4 of Table 2 tests this proposition, by adding the coefficient of variation of state revenues and spending for the 20 years prior to FY 2005 to the core regression. Fortunately, California's budget behavior does not generalize; measures of revenue and spending volatility are uncorrelated with the current budget gaps across all states.

Column 5 of Table 2 examines whether state political institutions are correlated with the size of the 2009 state budget gap. There is no evidence here that larger state legislative bodies or Democratic governors correlate with larger state budget gaps in FY 2009. The political economy literature has found larger state legislatures do spend more, but at least for FY 2009 it appears they also committed to higher taxes.²⁶ Democratic governors may also spend more, but again in FY 2009, they seemed to have taxed more too.

In the end, the most important correlate with the February 2009 budget gaps is the national recession, coupled with hopeful forecasting by the states as to future state revenues and redistributive spending. The national unemployment rate on June 30, 2008, was 5.5 percent. One year later at the end of FY 2009, it was 9.5 percent. If 2009 budgets had been based on projecting forward the 2008 unemployment rate, then the actual 4 percent increase would have indicated a \$180/person to \$222/person average budget gap,²⁷ which accounts for almost all of the variation in observed mid-year deficits seen in the data. The good news from this analysis

is that the state fiscal crises of 2009 appear not to be linked to any obvious structural or institutional failures in state finances. "It's the economy, stupid."

THE FEDERAL RESPONSE

As much as states are meant to facilitate efficient resource allocations between local governments in a well-designed federal system of public finance, so too is the national government meant to intervene when there are economic spillovers or allocative failures between the states. The current recession is arguably such a moment. The recession has threatened the ability of states to provide core services, particularly redistributive services, to their constituents. Further, as small open economies in a large economic union, state governments may be very limited in their ability to use economic stimulus strategies to restore state employment and growth to their pre-recession levels. Free trade and factor mobility between states mean any state's fiscal stimulus will be shared by citizens nationally, at least in the long run.²⁸ Both for fiscal insurance for core state services and to stimulate the national economy, federal government intervention may be appropriate.

Congress responded with the passage of the ARRA on February 17, 2009. The stated purposes of the legislation are to stimulate the national economy through \$288 billion in tax cuts and \$499 billion in new spending and to protect state and local public services by sending \$223 billion of the new spending to the states for support of core state services. This \$223 billion is to be disbursed over the three fiscal years beginning in FY 2009 and ending in FY 2011, thought to be sufficient time for state economies to recover from the recession. The total three-year allocation of \$761/person nearly equals three years of the mid-year FY 2009 budget gap of \$257/person. In the aggregate, ARRA funding appears to be sufficient to protect the level of

²⁵ Sheffrin (2004) provides a detailed and compelling analysis of California's budget "debacle"—his word, not mine—from this perspective.

²⁶ On the positive effects of the size of state legislatures on state spending, see Gilligan and Matsusaka (1995).

²⁷ That is, $4.0 \times 44.81 = \$179.24/\text{person}$ (see Table 2, column 6) and $4.0 \times 55.61 = \$222.44/\text{person}$ (see Table 2, column 1).

²⁸ Gramlich (1987) estimates that at most \$0.10 of every dollar of increased state fiscal stimulus, say in the form of increased state deficit spending, remains within the state to stimulate its economy. Even if the state economy does improve, Blanchard and Katz (1992) provide evidence that workers from other states will eventually move into the growing state and erode the economic gains for current residents.

Table 3
Determinants of 2009 ARRA Fiscal Assistance

	Total aid (1)	Total aid (2)	Stability aid (3)	Medicaid aid (4)	Highway aid (5)	Other aid (6)	Total aid (7)
State average per capita aid	\$761 (171)	\$761 (171)	\$157 (6)	\$247 (96)	\$117 (55)	\$240 (75)	\$761 (171)
Constant	695.9 (34.09)**	830.1 (93.14)**	161.3 (4.02)**	43.96 (45.87)	59.20 (27.18)*	238.1 (33.66)**	415.2 (88.75)**
State unemployment February 2009	—	-0.719 (0.513)	-0.719 (0.513)	-3.94 (5.39)	0.682 (2.98)	-1.79 (4.31)	-7.72 (8.99)
Budget gap 2009	0.253 (0.098)**	0.321 (0.107)**	0.002 (0.004)	0.137 (0.044)**	0.052 (0.025)**	0.045 (0.035)	0.232 (0.075)**
Medicaid expenses 2005	—	—	—	0.261 (0.036)**	—	—	0.392 (0.057)**
Federal highways 2005	—	—	—	—	3.43 (0.50)**	—	3.95 (1.49)**
State population	—	—	0.0001 (0.0001)	0.0030 (0.0015)**	-0.0024 (0.001)**	-0.0021 (0.0011)*	-0.0004 (0.002)
Senate chairman	—	—	2.81 (1.99)	-27.10 (20.96)	23.53 (11.10)**	32.27 (16.69)**	16.69 (33.86)
Close Obama vote	—	—	-0.506 (2.75)	-11.60 (28.61)	13.96 (15.22)	-6.08 (23.01)	2.12 (45.68)
R ² (Adj)	0.10	0.12	0.06	0.59	0.67	0.10	0.55

NOTE: Standard errors are in parentheses. *Significant at 10 percent or lower. **Significant at 5 percent or lower. All regressions contain 50 state observations. The variable "Senate chairman" = 1 if a particular state's senator holds either the chairmanship or is the ranking minority member of one of the following Senate fiscal committees: Appropriations, Banking and Urban Affairs, Budget, Commerce and Transportation, Environment and Public Works, or Finance. The variable "Close Obama vote" = 1 if President Obama's vote share was within the threshold 0.50 to 0.52 and is 0 otherwise.

spending states had planned in the spring of 2008 for FY 2009, before the full force of the economic decline was evident. As fiscal insurance, therefore, the overall level of federal funding is sufficient to close state budget gaps. Table 3 shows how the \$223 billion of state assistance is to be allocated across states.

How well does ARRA state funding meet its twin objectives of protecting core state services and responding to states in economic distress? Its performance is mixed. If the objective of ARRA funding is to fully protect state services in each distressed state, then we should expect a simple regression of each state's ARRA assistance against its budget gap to have an intercept close to 0 and a slope near 1.0—that is, be a 45-degree line. In fact, the intercept is \$695/person and is statistically

significant and the slope is only 0.25 and statistically different from both 0 and 1.0 (see Table 3, column 1). There is fiscal insurance, but it is not full coverage.

If ARRA assistance is meant to be a combination of targeted fiscal insurance and an economic stimulus for declining states, then we should expect significant positive coefficients on the levels of state budget gaps and state unemployment rates in a total ARRA funding equation (see Table 3, column 2). We continue to observe partial insurance coverage but no observable effort to match ARRA funding to state unemployment rates. With ARRA funding partitioned into its four main spending categories—(i) stability aid to protect state jobs (Table 3, column 3), (ii) Medicaid aid to supplement usual federal Medicaid funding (Table 3,

column 4), (iii) highway aid meant for “shovel-ready” construction projects (Table 3, column 5), and (iv) a collection of old and new programs in “other aid” (Table 3, column 6)—we regress each aid category on the state unemployment rate, state budget gap, and category-specific determinants and find no effort to match ARRA funding to high-unemployment states and only modest success at closing state budget gaps. If not full fiscal insurance or a targeted economic stimulus, what then is ARRA funding to states seeking to do?

The evidence in Table 3 suggests two goals: (i) stimulate the national economy using states as agents for spending federal money and (ii) pass an aggregate economic stimulus package as quickly as possible.

To get money into the national economy, the federal government must use existing government agencies and government programs. States are effectively federal “agencies” for spending federal money. Education aid to states (the most important component of ARRA assistance called “stability aid”), Medicaid funding, and highway construction grants are three prominent federal programs. Together these three spending categories account for just over two-thirds of all state ARRA funding.

To ensure quick passage of a stimulus program, the chosen political strategy appears to have been to (i) give all states some funding, (ii) not open new, or revisit old, distributional conflicts between the states, and, finally, (iii) give a bit extra to the states represented by the chairs and senior members of the important budgetary committees. Passage of ARRA took less than one month from its introduction as H.R. 1 on January 26, 2009. The House approved the final bill by a vote of 246 to 183 (with no Republican support), and the Senate voted 60 to 38 (with 3 Republican “Yea” votes). How were the funds allocated? First, every state received aid. The results in Table 3 reveal that stability aid works as a simple per capita grant, worth on average \$160/person (plus or minus a little bit; see Table 3, column 3). Second, ARRA used existing federal programs and their distribution formulas to avoid an unstable redistribution game between all legislators. ARRA selected one program that favored liberal, large, and high-poverty urban states—Medicaid aid (see Table 3, column 4)—and another

that favored conservative, small, rural states—highway aid (see Table 3, column 5). Finally, ARRA selected many small programs, and created some new ones in the category “other aid,” for specific groups of interest to committee members, paying particularly close attention to states with senators who run the major budget committees (see Table 3, column 6).²⁹

There is no evidence that presidential politics was decisive in the allocation of ARRA funding. In particular, states that provided Obama with his presidential election margin—Florida, Georgia, Indiana, North Carolina, and Ohio—did not receive additional ARRA support.

Viewing total ARRA funding as a single federal policy, it is best described as a three-year formula grant providing temporary fiscal relief from rising Medicaid costs and short-term fiscal stress with a few dollars for highway construction and a lot of lump-sum aid per capita in the guise of expanded and new program initiatives (see Table 3, column 7). The average state will receive \$290/person for Medicaid support ($0.392 \times$ average 2005 Medicaid expense = $0.392 \times$ \$741/person) plus \$60/person for relief for fiscal distress ($0.232 \times$ average 2009 budget gap = $0.232 \times$ \$257/person) plus \$49/person for highway construction ($3.95 \times$ average 2005 highway miles = $3.95 \times$ 12.33 miles/person) plus a per

²⁹ That congressional politics is an important determinant of ARRA spending should come as no surprise. This has been the “truth” of federal aid to state and local governments since the 1950s (see Inman, 1988). Here, the importance of “other aid” to the passage of ARRA is evident from a simple regression of U.S. Senate support by state (1 if both senators supported the bill, 0 if senator support is split, and -1 if both senators opposed the bill) on three variables: Obama (1 if President Obama won the state’s popular vote and 0 otherwise), Pop (state population), and OthAid (other aid per person allocated to the state).

$$\text{Senate support} = -1.22 + 1.15 \times \text{Obama} - 0.00001 \times \text{Pop} + 0.004 \text{ OthAid} \quad R^2(\text{Adj}) = 0.48$$

(0.44) (0.17) (0.00001) (0.002)

All regression coefficients except that on Pop are significant at the 5 percent level or lower. To interpret the results, notice that a non-Obama state (Obama = 0) receiving no OthAid would be unambiguously opposed to the legislation—that is, Senate support would equal -1. An Obama state receiving no OthAid would divide its Senate votes—that is, Senate support would equal 0. Allocating OthAid at its mean level of \$240/person is sufficient, however, to turn Senate support in an original non-Obama state from no support to a split vote and in an Obama state from a split vote to full support: $0.004 \times$ OthAid = $0.004 \times 240 = 0.96$. Finally, to test whether OthAid helped determine Senate support for ARRA, I ran the same regression as above but replaced OthAid with the state’s allocation of stability aid, then Medicaid aid, and then highway aid. None of the other aid categories had a significant effect on Senate support for ARRA.

capita grant of \$415/person. Together these four components equal \$814/person, accounting for all funding to be allocated by ARRA.

CONCLUSION

Today's deep recession has imposed significant fiscal hardships on our state governments. States have adjusted, but not without cuts in government spending and significant federal assistance through ARRA. As fiscal insurance for troubled state budgets, ARRA aid is relatively inefficient. The program provides a large per capita grant to all states, troubled or not, while closing at best \$0.23 per dollar of each state's recession-induced budget shortfall. ARRA's large component of per capita assistance is understandable, perhaps, since ARRA had a second objective of stimulating as quickly as possible the aggregate economy with a large infusion of federal monies. To achieve the stimulus objective it was necessary to use existing federal programs, and many of the largest (nondefense) federal programs—school aid, personal transfers, and construction—are administered by state governments. To ensure ARRA would pass quickly, congressional politics seems to have required that all states get significant funding. We have muddled through, but perhaps there is a better way.

What is needed in times of deep recessions is protection for state budgets and a quick fiscal stimulus for the macroeconomy. One alternative is a permanent federal program of fiscal insurance for state budgets that is triggered by a high unemployment rate for either an individual state or the nation. Such a program, however, is likely to create adverse incentives for at least four important state decisions: (i) Just as households have reduced precautionary savings in response to federal income insurance (welfare and Medicaid), so too might we expect states to reduce their contributions to their rainy

day funds. (ii) With such insurance, states may prefer high-variance tax instruments. Germany has a variant of fiscal insurance for lower-tier governments, and there is strong evidence that these governments have moved their tax structures toward more-volatile business taxes and away from more-stable residential taxes.³⁰ Third, states may lock in spending programs, either formally by contracts or informally by political agreements, that are economically attractive when private incomes are high but no longer economically justifiable when private incomes are low. Finally, if tied to state unemployment rates, such fiscal insurance would act as a deterrent to the efficient location of economic activity. Workers and capital may be discouraged from moving out of declining industries in declining states, and states may be encouraged to more aggressively pursue cyclically sensitive industries.

Rather than federal fiscal insurance, a better strategy would be to build on the optimal structure of state government finances in normal times. This approach begins by reconfirming the federal government's commitment to not bail out state governments in times of deep recessions. The "no bailout pledge" places the burden of insuring against bad economic shocks where it belongs, in the hands of individual states and their citizens. Insurance can be provided as it is now, by states self-insuring through budget-stabilization funds. An aggregate fiscal stimulus may still be needed in deep recessions, but the national government has its own tax and transfer policies available for this purpose. The evidence is convincing that these instruments can respond more quickly and are more powerful tools than government spending as a means for jump-starting a stalled national economy.³¹ This approach leaves state governments to do what they do well—provide the services their citizens demand at competitive tax rates.

³⁰ See Buettner (2007).

³¹ See Romer and Romer (forthcoming) and Johnson, Parker, and Souleles (2006).

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Commentary

Paul Rothstein

In this paper, Bob Inman gives a strong critique of crisis-driven federal support for the states. He bases this critique on an equally strong defense of American state-level public finance and the importance of preserving its capabilities. He argues that funneling crisis-driven federal money through state governments creates moral hazard and risks undermining a fundamentally sound system. If macroeconomic stimulus is needed, changes in federal taxes and transfers can deliver it. Bob then analyzes the assistance to states through the American Recovery and Reinvestment Act (ARRA) and argues that its relief is not well targeted to states with high unemployment or large budget gaps. He concludes that instead of offering more (or future) support, the federal government should reconfirm its commitment not to bail out state governments.

I essentially agree with Bob's conclusion about crisis-driven federal support for the states, which I call "ARRA-type spending." I am not, however, as inclined as Bob to read either the theory or the data about state-level public finance in such a positive way. The conditions that guarantee economic efficiency in models with multiple regions are strong and generally do not hold. Free migration of people and factors is a (mostly) good and powerful force but it doesn't do everything. More important, there are many actual pathologies at the state level, including large transfer programs, the underfunding of state pension plans, and inadequate rainy day funds. Since I find more flaws in the status quo, I weigh the costs and benefits of federal

crisis assistance somewhat differently. I also suggest that measured federal assistance in a crisis need not create moral hazard if it is conditioned on specific and positive state actions taken before the crisis, such as transparent accounting and strong stabilization funds. Crisis assistance that is contingent on more than just the crisis could provide substantial net benefits.

Bob begins with a brief and balanced review of the key principles of efficient state-level public finance. He explains the virtues of residence-based taxes, but notes that source-based taxes are more common. He argues that the mobility of taxpayers and factors of production discipline state governments, but notes that benefit spillovers make intergovernmental transfers necessary. He draws on Bohn and Inman (1996) to give conditions under which states will use long-term debt appropriately, but notes that the conditions are strong and public officials have many ways to hide deficits and use borrowed money to fund current services. He then summarizes:

In FY 2006, states were spending money on appropriate state functions, raising most of their money with efficient resident-based taxes, and running small current-account fiscal surpluses...The federal government provides assistance for state services with arguably significant interstate spillovers and does so with appropriate price-based subsidies. By most measures, states were fulfilling their assigned role in our federal system of public finance in FY 2006 (Inman, pp. 70-71).

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Rothstein

I would add that state-level public finance is also impressive over normal business cycles. Recent empirical work by Rodden and Wibbels (2010) on seven federations establishes that during downturns U.S. states draw down stabilization funds, reduce expenditures modestly, and allow revenues to fall (but work to attenuate the decrease with tax rate increases). These are good results insofar as sharp reductions in state spending and large tax increases can do outsized harm to businesses and consumers, a fact that Bob notes.¹ These results are largely achieved without additional central government assistance: In all but one federation, central government grants are procyclical or neutral.² Countercyclical ARRA-type transfers are rare.

The story so far is very positive and points toward efficient state-level public finance. There are a few caveats, however.

First, free migration ensures that all people reside in the location that best suits them, but what ensures that their utility is as high as possible? This is a complicated question. Migration imposes fiscal discipline but it need not make the outcome fully efficient. Sometimes decentralized efficiency fails (Boadway and Flatters, 1982). The known conditions under which efficiency holds are very specific (Myers, 1990). For example, giving migrants ownership stakes in the regions that they leave and enter fully internalizes the costs and benefits of moving. When capital is both mobile and taxed, inefficiency is all but guaranteed if the tax simply reduces the net return to capital and provides no benefits to capital owners (Wildasin, 1989). Efficiency has a knife-edge quality when the tax funds local public infrastructure that enhances capital productivity (Dhillon, Wooders, and Zissimos, 2007).

These models tend to predict inefficiently low levels of local public goods and infrastructure in normal times. A race to the bottom is more likely than a race to the top. Cutbacks in recessions should

therefore tend to produce large welfare losses, since the cost exceeds the benefit on even the “first” reduction. Federal assistance in a recession can reduce this injury, and the net benefits may be large.

An important objection to the previous point is that federal grants can ease fiscal competition and the constraint it places on spending. This is true, but mass migration and capital flows are not the classic kinds of local public-good spillovers discussed at least as far back as Olson (1969). Federal grants may plausibly correct Olsonian spillovers, but the complexity and subtlety of non-Olsonian spillovers make it much harder to believe that efficient grants can even be computed, much less implemented. Indeed, just to illustrate the subtleties, traditional Olsonian spillovers coupled with mobility can make federal grants unnecessary (Wellisch, 1993).³ Fiscal competition and the underprovision of local public goods seem closer to reality than efficient federal grants.

My second caveat concerns Bob’s claim that “states were spending money on appropriate state functions.” This claim is problematic, and the problem is Medicaid. Medicaid used 16.3 percent of state general fund revenue in 2008, down from 17.4 percent in 2006, but still substantially above the 14.4 percent in 1995.⁴ It averaged 20.7 percent of total state expenditures in 2008, ranging from 8.4 percent in Alaska and 10.2 percent in Wyoming to 30.3 percent in Pennsylvania and 34.5 percent in Missouri.⁵ In contrast, total public assistance expenditures were just 1.7 percent of expenditures across all states.⁶ Medicaid is an enormous program and its commitments are widely regarded as unsustainable (Ward and Dadayan, 2009; U.S. Government Accountability Office [GAO], 2009).

¹ This is not to deny the positive role that some exposure to negative shocks can play in government resource allocation. Policy analysis and improvement are not substitutes for the debates about priorities and the program reviews that occur when there simply is no money.

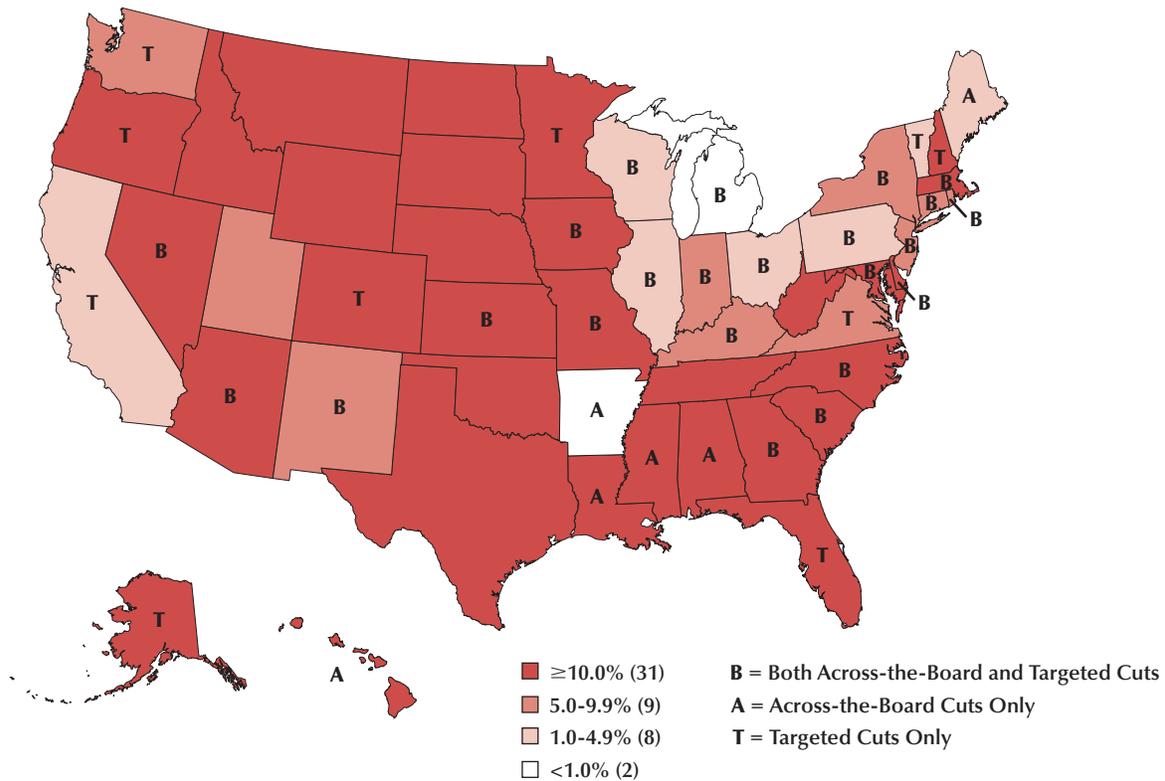
² “These results should put to rest any perception that intergovernmental grants are broadly countercyclical” (Rodden and Wibbels, 2010, p. 50).

³ In Wellisch (1993) and Myers (1990), efficiency requires resources to flow between regions, but these flows are decentralized in the sense that they are generated in Nash equilibrium by (i) regional taxes on property that is owned in part by nonresidents or (ii) explicit transfer payments chosen by the regions themselves. Even the Olsonian analysis is more complicated than it appears at first, since local revenue is still needed and some of the burden may fall on mobile bases.

⁴ National Association of State Budget Officers (NASBO, 2009, Table 3).

⁵ NASBO (2009, Table 29).

⁶ NASBO (2009, Table 19).

Figure 1**2007 Total Balance Percentages and 2009 Budget Cuts by State**

NOTE: The 2007 total balance as percent of expenditure. The total balance equals ending balance plus stabilization fund balance.

SOURCE: NGA and NASBO (2007, 2009) and author's calculations.

Medicaid is, fundamentally, a very large transfer program. The general theory of federalism tells us that there are substantial potential benefits from complete centralization (Brown and Oates, 1987). Empirical work on differences in costs and services across the states provides additional support for centralization (Holahan, Weil, and Wiener, 2003). Furthermore, it is reasonable to suppose that Medicaid draws resources away from other state programs. An extra dollar of state-level Medicaid revenue surely comes from some combination of lower spending on other state programs and higher taxes and not just from higher taxes alone. If so, the marginal benefits from these other programs are higher than they would be if not for Medicaid. The harm from recession-induced cutbacks in other

programs is therefore also higher than it would be if the states were not assigned this function.

A third caveat regarding efficient state-level public finance concerns retiree obligations. The proper matching of costs and benefits requires current taxpayers to pay for the retirement benefits of current state employees as part of their current compensation. Opinions vary about how much underfunding of retirement plans creates a risk of default, but there is no question that *any* underfunding shifts a fiscal burden to future taxpayers.⁷ Underfunding is, of course, widespread. Recent work by Robert Novy-Marx at the University of Chicago and Joshua Rauh of Northwestern com-

⁷ GAO (2008) provides a recent discussion of these issues.

Table 1**2007 Total Balances and 2009 Budget Cuts by State**

State	Fiscal year		
	2007 Total balance* as percent of expenditure	2009 Across-the-board cuts	2009 Targeted cuts
Alaska	49.9		X
North Dakota	48.5		
Nebraska	35.1		
Montana	32.4		
Oregon	25.8		X
West Virginia	25.6		
Louisiana	20.8	X	
Texas	20.5		
Delaware	17.4	X	X
Kansas	16.6	X	X
South Carolina	16.5	X	X
Alabama	16.1	X	
Idaho	14.6		
Oklahoma	13.8		
Minnesota	13.2		X
Georgia	13.1	X	X
Missouri	13.0	X	X
Wyoming	13.0		
Nevada	12.8	X	X
Tennessee	12.2		
Maryland	12.1	X	X
South Dakota	12.1		
Florida	11.8		X
Iowa	11.4	X	X
Colorado	11.2		X
Mississippi	11.1	X	
New Hampshire	11.0		X
North Carolina	10.8	X	X
Arizona	10.5	X	X
Hawaii	10.3	X	
Massachusetts	10.0	X	X
Kentucky	9.2	X	X
New Mexico	9.1	X	X
Connecticut	8.9	X	X
Virginia	8.5		X
New Jersey	7.3	X	X
Indiana	7.2	X	X
Washington	7.2		X
Utah	6.4		
New York	5.9	X	X
Ohio	4.9	X	X
Vermont	4.7		X
Pennsylvania	4.7	X	X
Maine	4.5	X	
California	4.3		X
Illinois	3.6	X	X
Rhode Island	3.3	X	X
Wisconsin	0.9	X	X
Michigan	0.1	X	X
Arkansas	0.0	X	

NOTE: *The total balance equals ending balance plus stabilization fund balance.

SOURCE: NGA and NASBO (2007, Table A-13; 2009, Table A-5a).

Table 2**Number of States Making Budget Cuts in 2009 by Adequacy of Total Balances in 2007**

Total balance as percent of expenditure	Type of cuts in FY 2009			
	Across-the-board and targeted	Across-the-board only	Targeted only	None
FY 2007: $\geq 10\%$ (no. of states = 31)	11	4	6	10
FY 2007: $< 10\%$ (no. of states = 19)	12	1	4	2

SOURCE: NGA and NASBO (2007, Table A-13; 2009, Table A-5a) and author's calculations. FY, fiscal year.

puted the existing liabilities to current state employees from 116 state pension plans. Assets in these plans were \$1.9 trillion at the end of 2008, but liabilities exceeded assets by at least \$1.3 trillion and perhaps by as much \$3.3 trillion.⁸

I raise this particular issue to discuss a general point about moral hazard. If a pension fund becomes insolvent, the political leaders who did not set aside sufficient resources would surely be punished even if the federal government stepped in to soften the consequences. Thus, it is not clear how the expectation of federal assistance influences their decisions. The same conclusion holds if those leaders do not expect to be in office when a crisis occurs. Bob notes that state decisionmakers have various ways of hiding debt. Perhaps this lack of transparency is the real problem; if so, it is not clear that moral hazard is relevant. Common sense about moral hazard is sufficient to identify the worst public policies, but models of the economic and political incentives facing decisionmakers are necessary for evaluating more careful proposals about federal assistance.

Bob's discussion of the \$233 billion in state assistance through the ARRA neatly summarizes a complicated policy. The nominal goal of this state assistance is to protect core state services and support states in particular distress. The aggregate funding is sufficient to close three years of projected state budget gaps. However, by regressing state-level assistance against various measures of state need, Bob shows quite elegantly that assistance is only weakly correlated with need. He then argues

that the structure of the plan reveals a more basic goal: to pass a spending bill quickly. This is why the ARRA made extensive use of existing programs and aid distribution formulas. These formulas do not track current economic conditions in the states, but using them minimized disruptive haggling among legislators.

The ARRA might have provided greater short-term gains in welfare if it had been targeted to places with the greatest need. Better targeting might also have created larger multiplier effects and macroeconomic stimulus. Unfortunately, once a crisis develops, targeting assistance to the places with the greatest need may cause the *electorate* to prefer mismanagement, in which case it is surely the worst policy in terms of moral hazard. Thus, it is also hard to recommend that the ARRA should have been better targeted. Is there a policy with better short-term and long-term properties than ARRA-type spending?

In principle, the answer is yes. The key to crisis assistance that is beneficial on net is to make it contingent on more than just the crisis. It is worth recalling that conditions on federal grants in the past have improved the functioning and professionalism of state agencies.⁹ It may be feasible to use indicators of responsible state budgeting, such as commitments to transparent budgeting and stabilization funds, to define qualifying standards for federal assistance during crises.

At the end of fiscal year 2007, 31 states had reserves equal to at least 10 percent of state expen-

⁸ Novy-Marx and Rauh (2009, p. 4).

⁹ This was certainly true for road building and public assistance; see Derthick (2001, pp. 15-17).

Rothstein

ditures. Nevertheless, in fiscal year 2009, 11 of these states had to enact *both* across-the-board and targeted spending cuts (see Figure 1 and Tables 1 and 2). An assistance plan that helped these 31 states—but did not support the 12 that entered the recession in a weaker position and *also* enacted both types of cuts—might enhance welfare with little risk of moral hazard. This seems like an approach worth studying.

The ARRA provides crisis-driven support for state programs. Bob sharply criticizes this approach to fiscal federalism, emphasizing moral hazard problems and the poor targeting of the support. I agree with his critique, but I still think there is a role for well-designed federal support during crises. Certain flaws in state finance suggest the possibil-

ity of large welfare losses from cutbacks during recessions. A policy that delivers federal support during crises for qualifying states can reduce such losses, encourage transparent budgeting and larger stabilization funds, and need not present moral hazard problems. This requires further research, of course. In sum, Bob provides strong arguments for uncoupling macroeconomic stimulus spending from federal support for state programs during crises but does not argue against crisis support altogether. Indeed, crisis support for qualifying states might even help to forestall future ARRA-type spending, since qualifying states are not likely to condone support for those that were less fiscally responsible in better times.

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Can State and Local Governments Rely on Alternative Tax Sources?

William F. Fox

State governments are much more likely than their local counterparts to depend on taxes other than sales, property, and personal income taxes. Excises on alcohol, beer, tobacco, gambling, and business taxes are among the alternative taxes. Local governments, on the other hand, are more likely to impose user fees. Reliance on these alternative state tax sources in aggregate has diminished over the past several decades, despite a pattern of rate increases and new gambling alternatives. Competitive pressures between states and with the federal government are likely to continue limiting reliance on these alternatives. Further, the same competitive forces are reshaping state corporate taxes to operate more like taxes on consumption than the traditional focus on taxing corporate production. In addition, states are seeking to broaden the set of business taxpayers to include those exploiting the state's market and noncorporate businesses. (JEL H7, H20, H71)

Federal Reserve Bank of St. Louis *Regional Economic Development*, 2010, 6(1), pp. 88-101.

State and local governments generate a substantial majority of their tax revenues from three sources: property, general sales, and personal income taxes. These three sources are responsible for 76.1 percent of total state and local tax revenue. State government taxes are more diverse, raising only 68.3 percent of revenue from these sources, whereas local governments obtain 87.7 percent of revenue from them (Figures 1 and 2). In fact, local governments raise a larger revenue share from property taxes alone than states do from the combination of the three taxes.

The remaining state and local government revenue sources include several tax instruments, most of which individually provide relatively little revenue. Excise taxes on alcohol, beer, gasoline, tobacco, and gambling are responsible for at least 16 percent of revenue at the state level, but these represent a large group of different taxes, not a single tax on each of these five sources.¹ Local

governments use excise taxes to a much smaller extent. State and local governments also use corporate income and other business taxes, construction and property transfer taxes, severance taxes, inheritance and gift taxes, unemployment insurance taxes, and others.

The significant revenue declines for state (and to a lesser extent, local) governments during fiscal years (FYs) 2009 and 2010 have motivated many governmental entities to expand current revenue sources and search for new ones. Some have continued to seek greater productivity from the larger sources. For example, at least 10 states have raised their income tax rate and 9 states have increased their sales tax rate since the beginning of 2009. But states are also seeking alternatives to the three large taxes, either in hopes that other taxes will be more stable or because it may be politically easier

¹ Some gambling revenues in Figure 1 are in the "Other Sales" category.

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Figure 1

State Tax Revenue (FY 2007)

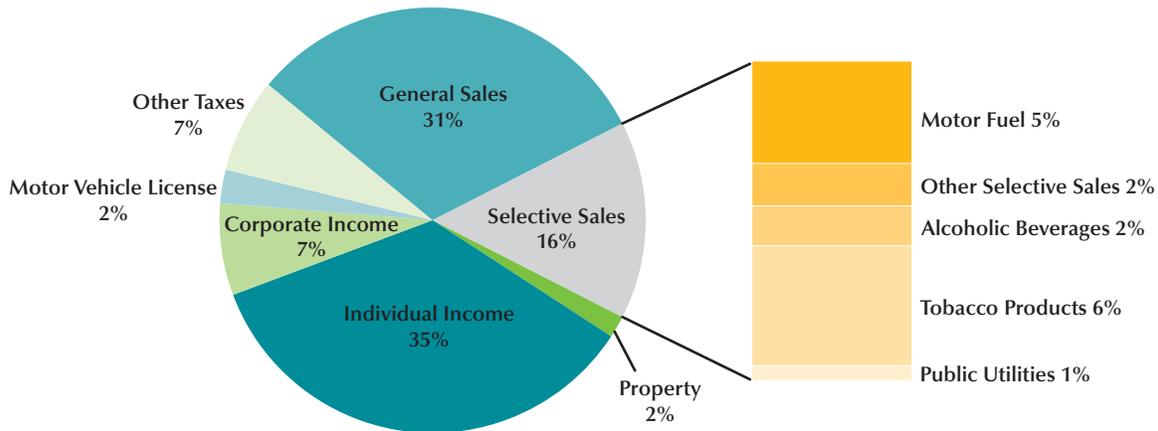
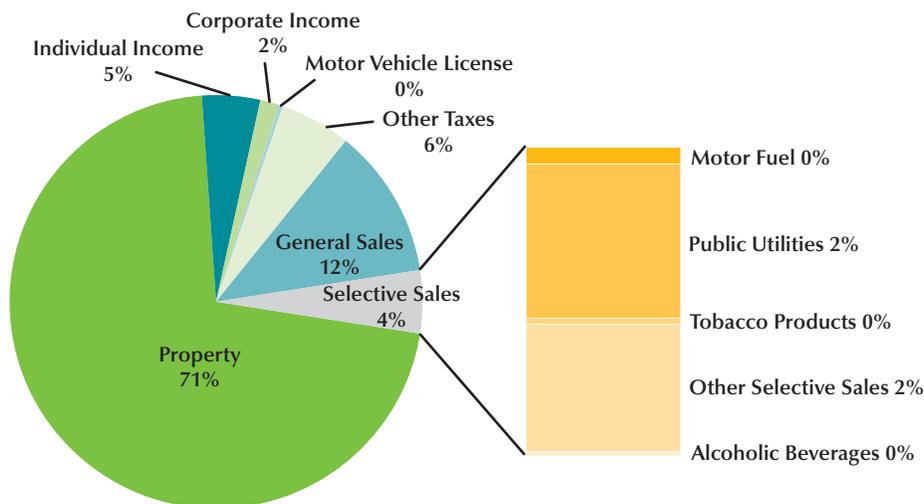


Figure 2

Local Tax Revenue (FY 2007)



to raise rates or broaden taxation to these alternative sources of revenue. Indeed, states have frequently raised their cigarette tax rates or broadened taxation to new forms of gambling, though these changes have not been concentrated solely during the recent recession.

In this paper I examine some of the alternatives to the three major taxes in terms of the characteristics of a good tax system: efficiency, adequacy, and equity. I focus almost entirely on state governments, since local governments generate little tax revenue from sources other than the largest three.

Table 1
Revenue Shares by Level of Government (2006-07)

Revenue type	State government	Local government	Total
Tax revenue	73.7	62.2	68.5
Current charges	13.7	25.2	18.9
Miscellaneous revenue	12.6	12.6	12.6
Total	100	100	100

NOTE: Revenue shares are expressed as percents.

Specifically, I concentrate on (i) selective sales taxes, such as those on alcohol, tobacco, and gambling, and (ii) business gross receipts taxes. Each of these taxes is primarily levied by state governments, so most of the paper focuses on the overall picture of state revenue sources. Having said this, state transfers to local governments represented 33.5 percent of local general revenues in 2007; such transfers were 86.8 percent as large as taxes. So, state revenue decisions are likely to have important implications for local governments.²

The remainder of the paper consists of five sections. The first section provides a brief description of local taxes. The next three address gross receipts taxes, gambling taxes, and tobacco and alcohol taxes. The final section provides a conclusion and further discussion.

LOCAL GOVERNMENT TAX SOURCES

Property taxes dominate local tax revenues; combined sales and income taxes generate less than one-fifth of total tax collections. Thirty-five states permit local sales taxes and 14 allow local income taxes. Because of their relatively modest contribution to collections and the small number of states permitting local sales and local income taxes, these taxes are probably best seen as alternative taxes at the local level rather than as potential significant sources of revenue. Reliance on these sources varies significantly across the country. Local governments

in some states (such as Arkansas and Louisiana) and some large cities (such as New York City and Philadelphia) use sales or income taxes heavily, but many other states and cities raise little revenue from these taxes. Hotel/motel taxes raise modest revenue in many cities, and a number of jurisdictions increased these taxes during the recession.

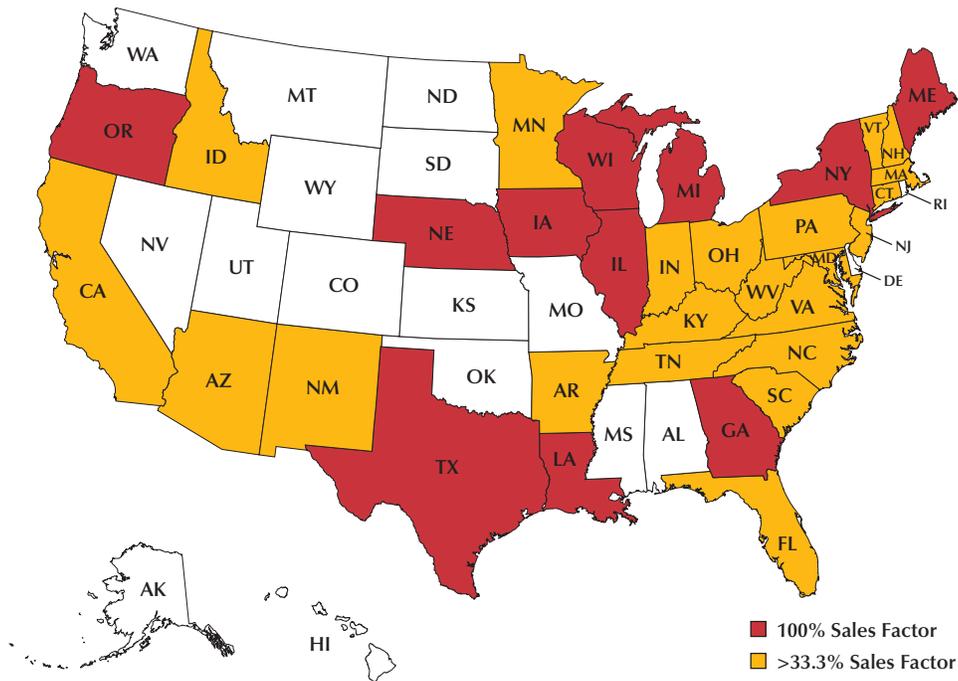
An excellent recent conference hosted by the Lincoln Institute on Land Policy examined local revenue sources in greater detail and considered some of the options available for local governments and private associations.³ Among these are tax increment financing, business improvement districts, and community facilities districts. One observation is that many of these variants on the major taxes are better seen as ways to earmark revenue rather than as new revenue sources.

Local governments to some extent offset limited tax options by relying more on user fees. As Table 1 shows, states raise a greater share of their total revenues with taxes and local governments make up for the difference with more emphasis on user fees. Various charges, including for hospitals, education, and sewerage, account for just over one-fourth of local general revenues.⁴ Local utility revenues, which are not included in total revenues in the table, are about half as large as local current charges, adding further to the reliance on user fees. State and local governments rely similarly on miscellaneous revenues.

³ See Ingram and Hong (2010).

⁴ General revenues include taxes and charges and exclude utility revenues, liquor state revenues, and insurance trust revenues.

² See state and local government finance statistics at www.census.gov/govs/estimate/index.html.

Figure 3**Sales Factor Apportionment (2008)**

NOTE: White states either have no corporate income tax or allow equal weight on the sales factor.

GROSS RECEIPTS TAXES

This section includes a discussion of gross and net receipts taxes and how they differ from sales taxes and an analysis of these taxes.

Understanding Net and Gross Receipts Taxes

Gross receipts taxes (GRTs), levies imposed on every transaction, have a long history among U.S. states. Several states, including Washington and Delaware, have maintained GRTs for many years. Other states, such as Indiana and West Virginia, replaced GRTs with other forms of business taxes several decades ago. Three states, Michigan, Ohio, and Texas, have added variants of GRTs in more recent years. A number of states continue to discuss the possibility of adding GRTs. Further, many states have increased the weight on the sales factor in their corporate income tax (CIT) apportionment formula

to impose a greater percentage of the tax on a destination basis.⁵ A 100 percent sales factor apportionment formula allocates a company's tax burden among states according to gross receipts, so these taxes have some similarities to GRTs (Figure 3).

Various states are also considering adoption of net receipts taxes (NRTs). The distinction between NRTs and GRTs is that the former allow deductions for certain purchases and normally for the purchase of intermediate goods. For example, last year's California tax commission proposed an NRT. Rhode Island's governor recently recommended an NRT but withdrew his recommendation in late January. The Texas and Michigan tax structures lie between a GRT and an NRT.⁶

⁵ At least nine states have now moved the siting of sales of services for the sales factor to a destination basis, consistent with the treatment of goods.

⁶ For example, the Michigan tax allows deductions for purchases of intermediate goods but not for services.

Policymakers have generally viewed GRTs as options for taxing business rather than as sales taxes intended to be paid by consumers, though the sales taxes in some states, such as New Mexico, are called GRTs. Admittedly, the differences between sales taxes as imposed in the United States and GRTs are modest in some respects, particularly as the latter have been structured in recent years. Sales taxes have traditionally allowed two major exemptions—sales for resale and component parts of manufactured goods—both of which are taxable under GRTs. The deductions allowed under an NRT and a sales tax are more difficult to distinguish, but the set of deductions would be much broader under the NRT since it would allow exemption of *all* intermediate input purchases.

GRTs have often been imposed on an origination basis and sales taxes on a destination basis.⁷ For example, Washington State taxes transactions based on the seller's location. Sales taxes are generally due where goods are shipped (the point of destination), not the point from which the goods are shipped (the point of origination). The states that recently adopted GRTs have all imposed these taxes on a destination basis, again making the GRT more parallel to a sales tax.

States have implemented GRTs for a variety of reasons but generally as a replacement for other taxes, particularly income-based corporate taxes. The new Michigan GRT was intended to partially replace the single business tax that had previously been eliminated. Also, GRTs are seen as a means of taxing a broader set of firms than is possible with CITs since GRTs are imposed on unincorporated businesses, nonprofitable firms, and businesses protected by PL 86-272.⁸ GRTs are also a way to tax the service sector—something that has proven elusive through the sales tax in many states—since service producers would also be liable for the tax.

Evaluating Gross Receipts Taxes

Some consider the ability to extend taxation to a broader set of taxpayers and to some services

⁷ This distinction is true for sales taxes on goods. Sales taxes on services have often been levied on an origination basis.

⁸ PL 86-272 is a federal preemption that prevents states from imposing a CIT on firms whose only relationship with a state is solicitation of orders for the sale of tangible personal property. PL 86-272 applies only to income-based taxes.

an advantage of GRTs compared with the CIT. GRTs are also perceived as entailing lower compliance and administrative costs than the CIT, since the GRT requires measurement of only gross receipts, not of profits. The GRT base is effectively the numerator in the CIT apportionment formula. Thus, the Ohio GRT return was created the size of a postcard. NRTs entail additional complexity and likely require apportionment because of the difficulty of tracking where deductions are to be attributed. This issue is addressed in more detail later in the text.

Alternatively, rather than allow deductions, as is permitted with NRTs, some states (for example, Washington and Texas have multiple rates and allow deductions) have adopted multiple tax rates, with higher rates generally on industries that produce items that are sold primarily to final markets or have fewer production steps. The use of multiple tax rates imposes somewhat higher administrative and compliance costs as decisions must be made on the tax rate that applies to each type of commodity or each firm. In Washington State, for example, the same firm may sell goods and services in more than one of the 28 classifications and be subject to multiple tax rates (though the same tax rates sometimes apply to more than one classification). Further, the economic distortions with a multiple-rate GRT may be similar to those with a single-rate GRT.

Economists raise several key efficiency issues with GRTs and generally argue that they are poor tax instruments. GRTs can cascade unevenly into input and output prices since they are levied at every stage of the production process. This cascading distorts relative prices compared with a uniform tax.⁹ A Washington State study measured the degree of cascading from a GRT (defined as the effective tax rate on an industry divided by the actual tax rate) for a range of different industries.¹⁰ On average the effective rate was 2.5 times the stated tax rate, but the degree of cascading varied from 6.7 times for industries such as food manufacturing and petroleum refining to 1.4 times for data processing. Washington's decision to use multiple rates, with a general tendency for lower rates on input costs,

⁹ Neither the sales tax nor the CIT is uniform across all commodities.

¹⁰ See the 2002 Washington State Tax Structure Study Committee report.

should lessen the extent of cascading relative to a fixed-rate GRT, though this entails the compliance costs described previously. The Washington data should account for the effects of multiple tax rates on cascading. Washington has had a GRT for many years, so the extent of cascading there includes how firms have adapted their behavior to the tax.

The incentives to produce and consume are altered as the cascading tax changes relative prices, which leads to economic inefficiencies. The differential propensity for the tax to cascade raises relative production costs for industries such as food manufacturing and presumably encourages production in Washington of more lightly taxed industries relative to more heavily taxed industries. Firms can limit the extent of cascading taxes to some degree by vertical integration. But economic inefficiencies also arise to the extent that firms are induced to vertically integrate to lessen the taxation of intermediate inputs, rather than because it represents more efficient business practice. Firms that vertically integrate should be able to limit the extent of tax cascading and thereby gain a competitive advantage that helps keep their production costs low. However, decisions to vertically integrate when it is not the best business practice, other than for tax savings, entail efficiency losses to the economy.

Economists generally prefer the CIT, which is often seen as the alternative to the GRT, under the expectation that the CIT does not incur the efficiency disadvantages created by the GRT. In some cases, this perspective may arise because the CIT is evaluated in an ideal setting, not as the tax actually operates. The CIT introduces its own distortions, and more careful analysis suggests that the distortions of the GRT relative to the CIT may not be as great as has been implicit in discussions about these taxes. The actual state CIT is apportioned for about 70 percent of the revenue received by states. This apportionment can be better viewed as a tax on the factors in the formula—payroll, property, and sales. As states increase the weight on the sales factor, the tax moves toward a point where the burden across states is allocated on the basis of gross receipts—that is, the tax operates much like a sales tax on corporations. Arithmetically, distribution of the burden based on gross receipts cre-

ates some incentive for vertical integration, albeit smaller than with the GRT.¹¹

The CIT is a tax on payroll and property to the extent that these factors are weighted in the apportionment formula, potentially creating distortions not introduced by the GRT. In addition, recent analysis of industry structure more intensely questions some of the conventional wisdom on the economic inefficiencies of GRTs compared with CITs. Yang (2010a) finds that GRTs may provide an incentive for firms to vertically integrate, but this depends on the extent to which intermediate good pricing in the upstream market is affected by the fall in demand that occurs with imposition of the GRT in the downstream market. The GRT may discourage vertical integration if upstream prices are flexible enough to move downward in response to the tax. Some recent research suggests that the extent of vertical integration is less than has often been thought (Hortaçsu and Syverson, 2009). Yang (2010a) also finds that GRTs may allow profits in the upstream state to be shifted to the downstream state (assuming the firms are in different states), which can increase the well-being of the downstream state—albeit at the expense of the upstream state—so that national welfare is likely reduced. Also, GRTs do not create an incentive to alter a company's legal structure, as is encouraged by the CIT.

GRTs should be more difficult to avoid than CITs since firms can plan for taxes only by altering where items are sold, not by changing their measured profits. Firms are unlikely to choose not to sell in a state merely to avoid a low rate tax.¹² They do, however, alter their measured profits by changing their corporate structure, moving production to low-tax states, and making decisions to avoid establishing corporate nexus, such as is possible through PL 86-272. This limitation from PL 86-272 applies only to income-based taxes.

No careful studies exist on the winners and losers from the cascading process, though the expect-

¹¹ Personal correspondence with Dave Merriman, November 2007.

¹² Origin-based taxes distort cross-state producer prices and destination-based taxes distort cross-state consumer (or buyer) prices. The assumption is that distortions in producer prices across states have greater implications for efficiency than distortions in consumer prices across states. This assumption may become less reasonable as Internet sales grow if states cannot enforce destination-based taxes.

tation is that heavy buyers of items with the greatest cascading bear the greatest tax burdens. The propensity for GRTs to cascade alters both horizontal and vertical equity since the tax implicit in each final sale depends on the extent of cascading and the ability to shift these taxes into consumer prices.

At first blush, the NRTs are expected to eliminate the distortions in relative prices and incentives for vertical integration that arise from GRTs because the tax appears to be a destination value-added tax (VAT). The tax is a VAT if all sales are totally within a single state and would be neutral on all factors. However, NRTs do not serve as VATs when sales occur across state borders; the tax is imposed on a destination basis and deductions are allowed for purchases of intermediate goods by both in-state and out-of-state firms selling in the state (or in-state firms selling out of state). Border adjustments, which occur with VATs around the world, are necessary to ensure that cross-state transactions are treated neutrally on a destination basis. However, the only adjustment for the selling firm with an NRT is for purchases from the immediately preceding input providers in the production chain. As a result, the NRT state tax liability implicit in any sales from out-of-state firms will be only on the value added from the selling firm plus any additional value added in the NRT state. So, the NRT base on cross-state sales will often be less than the full value of a good or service, whereas the full value should be taxable when all production in the chain is in state. Tax will also be implicit in sales from firms in the NRT state to out-of-state buyers to the extent that there is any value added by firms earlier in the production chain in the NRT state. Thus, firms can avoid tax by undertaking all earlier steps in the production process in a state with lower taxes or by vertically integrating.

Firms also can potentially lower their tax liability by creating a sales corporation in a non-NRT state for purposes of selling in an NRT state. The firm would then sell to the sales corporation, take a deduction for the value of this intermediate transaction, and resell in the NRT state. Both firms in the NRT state and firms in other states can lessen their tax liability by creating sales corporations. The bottom line is that NRTs (i) do not operate as

VATs, (ii) create inefficiencies that are difficult to assess, and (iii) have not been carefully analyzed at this time (see Bankman et al., 2009).

GRTs should perform well in adequacy terms. As a general rule, the breadth of the base with both a gross and net tax allows substantial revenue to be raised at rates that are very low compared with those levied on corporate profits. Revenue-neutral rates on a broad NRT can probably be in the 2 percent range and on gross receipts can be much lower. For example, Texas levied a 0.5 percent rate GRT and Ohio imposed a 0.26 percent rate GRT. The revenue-neutral rates must be higher to the extent that additional exemptions or deductions are permitted under a true NRT. The new Texas tax has underperformed expectations but it was created with three alternative deductions, which makes it difficult to anticipate the revenues.

Tax revenues with both the NRT and the GRT should grow over time with economic activity. No measures of the revenue elasticities with respect to economic activity have been developed as yet for GRTs and NRTs, but they should be close to 1 (Ohio estimated the elasticity as slightly less than 1) unless there are strong trend changes in the number of steps in the overall economic production chain. Also, state policy decisions to narrow the base could lower the long-term revenue growth. CITs had very poor revenue performance during the 1990s and into the early 2000s, but the revenues grew very rapidly during the later stages of the economic expansion of the 2000s. GRTs are expected to be more stable than CITs, since the volatility of total sales is expected to be much lower than the volatility of corporate profits.

GAMBLING TAXES

States rely relatively heavily on imposing a series of selective excises on goods and services that are considered unique options for taxation. Alcohol, gasoline, and tobacco products have long been the focal point for specialized taxation. Gambling has become a target during the past 45 years as states continue to expand options for gambling. Experience of the past decades suggests that taxpayers find excises on these sources (or at least increases in these taxes) more politically

palatable than broad-based taxes. Perhaps people find “sin taxes” acceptable or consider taxes on these commodities more “voluntary” than broad-based taxes. The next two sections focus on taxation of gambling and alcohol and tobacco. Gasoline taxes are not considered here since the revenue is frequently earmarked for road usage and changes in the rates and bases have been less common than for gambling and tobacco taxes.

The contribution to state finance by the range of selective excise taxes has diminished dramatically over the past 60 years. Combined, these taxes raised 40 percent of state tax collections in 1947 but only about 15 percent in 2007. The share has continued to fall over the past 15 years despite the frequency with which some tax rates have been increased.

States have moved broadly into taxation of gambling since New Hampshire adopted the first modern lottery in 1964. Every state except Hawaii and Utah now allows and taxes some form of gambling. Today, 43 states operate lotteries, 11 of which have been adopted since 1991.¹³ Twelve states allow commercial lotteries, five of which have been adopted since 1991. Since 1991, racinos (race tracks with casinos) have been permitted in 12 states. In addition, 43 states allow parimutuel gambling and 32 have gambling at Native American facilities. Lotteries raise almost three-fourths of state gambling tax revenues and casinos raise another 20 percent. Parimutuels and racinos generate modest shares, though the racino share has increased in recent years with growth in the number of venues and states that allow them.

States continue to adopt new forms of gambling or to allow gambling at new or expanded facilities as sources for additional revenue. For example, Kentucky’s governor has proposed adoption of racinos, Illinois has proposed outsourcing the lottery, Pennsylvania is permitting casino gambling, and other states are seeking ways to use the Internet to expand gambling. Despite these increases, gambling has remained a near-constant share of total state tax revenues for some years—between 2.1 and 2.5 percent.

Gambling taxes have exhibited mixed performance in adequacy terms.¹⁴ The revenues appear to be relatively stable; the first decline in at least three decades occurred in 2009. The 2.6 percent fall in gambling revenues in 2009 was small compared with the total state tax revenue decline of 8.3 percent and the personal income tax decrease of 13.6 percent during 2009, suggesting less instability than the larger state tax revenue sources.

Both major gambling sources have exhibited some revenue volatility in recessions. Growth rates for lottery revenue alone have generally decreased over the past several decades and revenues actually fell in 2001 and 2002 and declined again, at least in 2009 and possibly 2010. Casino revenues appear to have decreased during both 2008 and 2009. Casino revenues adjust relatively rapidly to norms when revenues perform below equilibrium, such as during a recession. This suggests that gambling revenues may resume their growth sooner in post-recession periods than sales and income taxes (Nichols and Tosun, 2008).

Perhaps more troubling is that the growth trend for gambling tax revenue has been modest compared with other taxes, such as personal income and sales taxes. This suggests a low, long-term revenue elasticity. Gambling tax revenues rose somewhat more slowly than the average tax source from 1998 through 2008, and much of the increase in gambling revenues has resulted from new games or new states legalizing various forms of gambling. In the past decade, at least six states added lotteries, six added racinos, and one allowed casino gambling. Dadayan and Ward (2009) find that gambling revenues grew much more slowly than other tax sources if the effect of new entrants is excluded.¹⁵

Empirical analysis by Garrett and Coughlin (2009) is consistent with slow lottery revenue growth. They note that lottery revenues peaked in West Virginia in 1999 and have not grown in real per capita terms in Iowa since 1977. Nichols and Tosun (2009) examined long-run and short-run revenue elasticities for casino revenue. They found

¹³ See Dadayan (2009).

¹⁴ The discussion of performance of gambling revenue draws heavily from Dadayan and Ward (2009).

¹⁵ Of course, some of the change in tax revenues from other sources can also be attributed to higher rates.

that long-run elasticities are initially relatively high—between those for income and sales taxes—when states first adopt casinos. However, the elasticities fall over time and are lower than for both income and sales taxes for more mature markets, such as Atlantic City and Nevada. The revenue data suggest that states will find it difficult to maintain the share of revenue provided by gambling unless new forms can be found in coming years.

Previous research has focused on gambling tax revenues and not net new revenues to the government. The increase in revenue that a state can obtain from higher gambling taxes can be determined only in a general equilibrium setting since employment and other effects also occur with the adoption of gambling. The net effect of legalizing gambling and imposing a tax or raising gambling tax rates will probably be smaller than the revenues generated by the tax. The expenditures on gambling by in-state residents are not available for other purposes, which presumably means lower revenues from sales and excise taxes. Additional revenue could be obtained from cross-border gamblers but the potential for most states to benefit from cross-border gambling is limited. Interestingly, adoption of gambling in neighboring states appears to have little effect on the income elasticity of gambling in the home state (Garrett and Coughlin, 2009), which suggests that policy changes in neighboring states have little effect on the gambling revenue in the home state.

The efficiency consequences of gambling taxes, as with taxes on alcohol and tobacco, are a complicated function of the distortions in individual consumption behavior caused by imposition of the tax (that is, the reduction in consumption caused by the price increase resulting from imposition of the tax) and the social effects from consumption of the commodities. The efficiency effects become even more complicated when aggressive government advertising to encourage consumption is taken into account. State legalization of gambling in forms that may be more addictive, such as casinos rather than lotteries, potentially increases the social consequences. This paper is focused on the revenue-raising effects of taxes, so the broader set of social consequences associated with consumption of the taxed goods and services is not addressed here.

Most of the related research on gambling is specific to lotteries, so much of the following analysis applies specifically to lotteries. Tax rates on gambling, and particularly lotteries, are often very high. For example, the net proceeds available to state governments from lotteries average 23.5 percent of total expenditures and 26.6 percent if administrative expenditures are added to the proceeds.¹⁶ This is consistent with an average tax rate between 31 and 36 percent on lotteries, a very high tax rate compared with rates often imposed on other activities. The resulting distortion in relative prices can entail significant losses in economic well-being (by reducing gambling) with two exceptions: The efficiency losses associated with high tax rates are much smaller if consumption is relatively unresponsive to price and if the tax is intended to limit the negative social consequences by discouraging gambling.

This paper focuses on the revenue side of government, not how the tax revenue is used. However, research on lotteries provides an exception that should be considered. Theoretical research indicates that lotteries elicit higher levels of public expenditures than do other voluntary mechanisms to support public services. High lottery tax rates may also not be as distortive if players are participating because they expect to receive benefits from the expenditures or they value the additional finance for public service provision—in simpler terms, consumption may not be decreased as much as anticipated by the tax. For example, Landry and Price (2007) find that lottery expenditures are higher when the revenues are earmarked for education. They interpret this as meaning that lottery players are taking the education expenditures into consideration when choosing to participate in the lottery. Further, they find that casino gambling is a substitute for the lottery in states where the proceeds go into the general fund, but not in states where the funds are earmarked for education. This suggests that players in earmark states consider the education benefits associated with the lottery and not merely the love of gambling when they choose to play the lottery. Further, Landry and

¹⁶ For income and apportionment of state-administered lottery funds by state for 2008, see www2.census.gov/govs/state/08lottery.pdf.

Price (2007) find that lottery receipts rise in states where the proceeds to education are a greater share of the expenditures.

Gambling taxes are generally seen as regressive, though research indicates that the extent of regressiveness can vary by type of game and over time. For example, Miyazaki, Hansen, and Spratt (1998) find that most lotteries are regressive. More recent research by Garrett and Coughlin (2009) concludes that lotteries are regressive, though the degree of regressivity changes over time. The extent of regressiveness is generally observed to depend on the game. Perhaps surprisingly, the regressiveness of online games is similar to that for other instant games. Large jackpot games are less regressive than smaller games, such as instant games. Oster (2004) finds that lotteries become less regressive as the size of the jackpot rises and suggests that lotteries might even become progressive at very high payouts.

A small set of gamblers is often responsible for a substantial share of consumption (though this may be less true for lotteries than for other forms of gambling). Thus, the incidence on the median and many low-income households can be much smaller than on the average household. This may lessen the implications of regressiveness on low-income households but emphasizes the propensity of gambling taxes to be on addictive behavior.

ALCOHOL AND CIGARETTE TAXES

State and local alcohol and tobacco taxes raised \$21.5 billion in FY 2007. These taxes are imposed almost exclusively by states since local governments generate less than \$1 billion from them. A wide range of taxes is levied on these commodities, often by type of product. Cigarettes, chewing tobacco, beer, wine, and spirits are frequently taxed with different rates and bases.

The underlying growth of these taxes is expected to be slow since each is generally levied on some form of quantity purchased rather than value.¹⁷ At least in part to offset the slow underlying growth rate, states have frequently increased

tobacco tax rates. Forty-six states and the District of Columbia combined have raised cigarette tax rates at least 100 times since 2000.¹⁸ Hawaii has increased rates the most—nine times—but many other states have raised rates multiple times. The average year-end tobacco tax rate has grown from about 20 cents per pack in 1989 to about \$1.34 per pack in 2009 (Figure 4).¹⁹ The federal tax rate was increased to \$1.01 per pack in 2009 so the combined tax, including federal, state, and local rates, reaches much higher.

State tobacco tax revenues have risen relatively fast over the past 15 years and at approximately the same rate as the individual income tax. But the revenue increases have been mostly because of the rate changes.²⁰ Still, revenues have not risen nearly as fast as tax rates have been increased, suggesting higher rates have significantly lowered the number of taxed packs that are purchased and likely has changed where they are purchased.

Some alcohol tax rates have also been increased in recent years but much less frequently than those for tobacco products. Further, alcohol taxes generate a much lower share of total tax revenue than tobacco taxes. Alcohol raises only about 26 percent of state combined tax revenues.

As with gambling taxes, understanding the efficiency effects of alcohol taxes is affected by a given state's multiple taxation goals, including discouraging smoking or alcohol consumption, paying for the health care costs associated with smoking or drinking, and collecting general revenues on a relatively price-inelastic commodity. Views of how the revenues should be spent also differ. For example, those concerned with reducing consumption of alcohol or tobacco products often lobby for the additional tax revenue to be earmarked for anti-consumption programs.

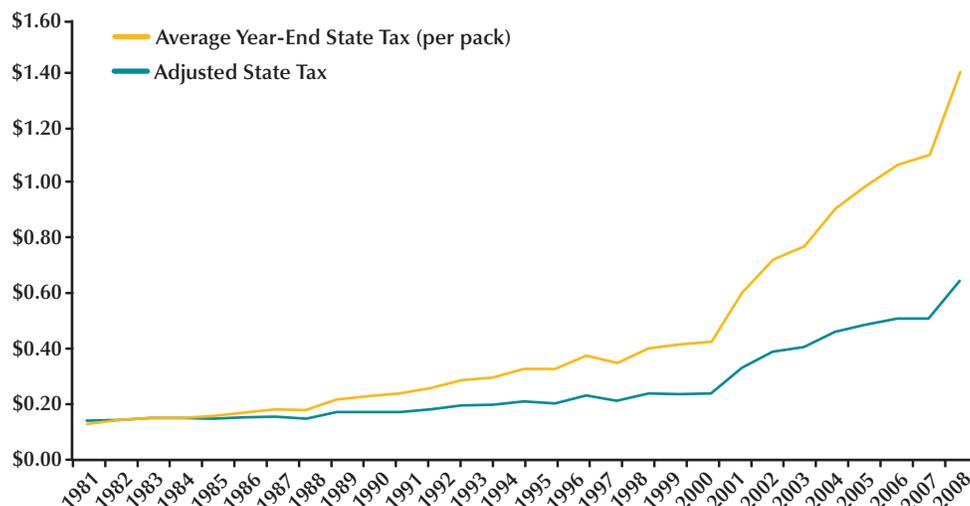
Much of the related research is on cigarette taxes, so most of the following discussion applies specifically to cigarettes. Tobacco tax rates have

¹⁸ See www.taxadmin.org/fta/rate/cig_inc02.html for cigarette tax increases from 2000 to 2010.

¹⁹ See www.tobaccofreekids.org/research/factsheets/pdf/0097.pdf for state cigarette excise tax rates and rankings.

²⁰ State tobacco tax revenues contain revenues from all tobacco products, including cigarettes, cigars, and chewing tobacco.

¹⁷ A number of exceptions exist, such as Tennessee's mixed drink tax.

Figure 4**Tobacco Tax Rates**

become high relative to the pretax price, which could create important distortions in consumption behavior. State cigarette tax rates vary substantially across states, from 17 cents per pack in Missouri to \$3.46 per pack in Rhode Island. Tobacco tax rates can easily exceed 100 percent on the pretax price when taxes at all levels are combined. The American Heart Association, which served as an advocate for many of the tax rate increases, is pleased that cigarette sales have diminished, but state fiscal planners may not appreciate the impact on revenues.

Rate differentials create the potential for significant bootlegging and increased cross-border sales. Lovenheim (2008) finds that between 13 and 25 percent of consumers purchase cigarettes in lower-tax states or on Native American reservations. As a result, cigarette consumption is relatively unresponsive to home state price increases (such as those associated with tax rate hikes). Indeed, consumption may actually increase in some cases as tax rates rise and home state consumers increase out-of-state purchases. So, home state tax rate increases may not decrease consumption and may have little effect on revenues since smuggling and cross-state purchasing rise with the tax rate increases.

Thursby and Thursby (2000) conclude that commercial smuggling accounted for about 4 percent of cigarette sales in the 1970s and subsequently declined as tax rate differentials fell. They also find that higher federal tax rates increased smuggling. The recent spate of tax rate increases and resulting wide diversity of rates suggest that smuggling may be growing again. Slemrod (2007) has argued that policy changes that reduce smuggling may be effective in helping states achieve the objectives of less consumption and more revenue, since these are means of enforcing destination taxation on cigarettes. The Prevent All Cigarette Trafficking (PACT) Act of 2009 requires vendors to collect excise taxes on cigarettes that are delivered. This requirement should limit the extent of bootlegging and cross-border shopping.

Joint ownership of cigarette tax bases by the federal and state governments suggests that tax rate decisions by one level of government can affect the other. Tax rate increases by one level of government reduce the base taxed by that level (as consumption decreases and/or illegal sales increase) and create a vertical externality as the other level of government also faces a smaller base and reduced tax revenue. The non-rate-increasing government

could choose to raise or lower its rate in response to the fall in tax revenues. A higher rate would be intended to offset the revenue loss and a lower rate to keep the taxable base from shrinking.

Much of the research on the vertical relationships between federal and state governments has been aimed at cigarette taxes because the rates are easy to specify and some of the other necessary data for the analysis are available, but there has also been research on other taxes. Studies across several different taxes have often found a positive relationship, suggesting that states raise their tax rates as the federal government increases its tax rates (see Deveraux, Lockwood, and Reoano, 2007, and Yang, 2010b, for examples of cigarette taxes). But the results are not fully consistent. Fredriksson and Mamun (2008) find a tendency for states to lower their cigarette tax rates as the federal government increases its rate (there is a negative vertical reaction function). As a result, they find that state tax revenues decline as the federal tax rate increases, both because states lower their rates (relative to what they otherwise would be) and the federal rate increase reduces the taxable base.

Similarly, horizontal relationships can exist because one state's tax rate increase can affect another state's tendency to raise or lower its tax rate. The expectation is that a neighboring state's rate increase should raise the home state's revenues since the neighboring state's rate increase would encourage additional cross-border shopping by out-of-state buyers (or less cross-border purchasing in the neighboring state should its rate be lower). The home state could reduce its tax rate because of the additional revenues it receives from more cross-border shopping or raise its rate because it can now do so without fear of creating losses from reduced purchases within its borders. Research has generally found that states use increases in neighboring states as "cover" to raise their own tax rates (the horizontal reaction function is positive), so the home state also raises its rates. This response could also be seen as a yardstick effect.

Not surprisingly, research has found that consumers are more likely to bear a federal cigarette tax rate increase than a state rate hike (Barnett, Keeler, and Hu, 1995). Simply, consumers are better able to find alternative places to buy cigarettes

that are not subject to a rate hike imposed by a single state than by the federal government.

DISCUSSION AND CONCLUSION

History tells us that states will continue to change policy related to alcohol, tobacco, and gaming. More states will allow broader access to gambling and will continue to impose taxes on the newly adopted games. Alcohol and tobacco tax rates will rise further. However, competition between states for gambling and sales of alcohol and tobacco will likely make it increasingly difficult for rates to rise dramatically higher. Cross-border shopping and bootlegging have grown and will limit states' ability to push tax rates dramatically higher even as the PACT Act assists states in imposing cigarette taxes. As a result, revenues from these sources will rise in nominal terms but at best will remain flat and in all likelihood will fall relative to total state tax revenues over the longer term—continuing the decades-long pattern.

States will also continue to examine options for altering business taxes. The jury is still out on the best ways to tax businesses at the state level. The underlying impetus for business tax policy changes appears to be lower taxes on production (taxes at the origin) to enhance economic development. States have also sought to expand the set of tax-paying businesses to reduce the burdens on heavy manufacturing and to ensure that "out-of-state" and "in-state" firms are taxed more evenly. States have used two principal methods to achieve these objectives: reforming the CIT and adopting new tax instruments. Taxation at the source or origin with the CIT has been reduced by increasing the weight on the sales factor in the formula and altering the siting provision for sales of services to a destination basis. These changes effectively cause the CIT to operate more like a sales tax (though only on profitable corporations), suggesting that these methods are possible ways to mask increases in the sales tax. Of course, states have made other reforms/changes, such as greater reliance on combined reporting, but it is less clear how these alter the extent of taxation at the source. Some states have also expanded the CIT to include other busi-

Fox

ness structures, most notably limited liability corporations.

Another approach taken by states has been the adoption of new structures such as GRTs or NRTs. These tax structures are more easily expanded to noncorporate businesses, unprofitable firms, and out-of-state firms selling within a state. In many cases, these taxes are built into prices in the destination state so they also operate as sales taxes, although GRTs are likely to cascade more than sales taxes. Many other effects of these taxes require additional study before states go too far down this road.

Cross-state competition sustains pressure on states' ability to tax at the origin, making it likely that transitions in business taxation will continue. Fiscal stresses from the recession may slow some changes that otherwise would occur, but these will not curtail the longer-term trend toward taxes on consumers rather than producers. Elimination of corporate taxes is an option well worth considering that states have not seriously addressed yet. Explicit, broad-based sales taxes at flat rates are a better tax policy than a sales tax imposed through the CIT veil.

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Commentary

Gary A. Wagner

It is no surprise that the most recent economic downturn, which some have called the “Great Recession,” has had a substantial impact on the fiscal health of state and local governments. According to the National Governors Association (NGA) biannual report, *The Fiscal Survey of States*, state tax collections in fiscal year (FY) 2010 were almost 12 percent below 2008 levels and are expected to remain near that level for FY 2011.¹ More than 40 states have responded to the declining revenues by enacting midyear budget cuts in both FY 2009 and 2010. This is the first time widespread, back-to-back spending reductions have been enacted since the NGA began monitoring state fiscal conditions on a regular basis in 1979.

In addition to prompting state and local governments to reduce expenditures, periods of fiscal stress also provide the impetus for them to explore opportunities to generate additional revenues from both traditional and new sources. Professor William F. Fox’s (2010) article provides a careful analysis of some of the more recent trends and issues involved in generating revenue from non-traditional sources such as gambling and business gross receipts taxes (GRTs). My comments, for the most part, will complement and mirror Professor Fox’s article by providing an overview of state and local revenues, extending his analysis of GRTs, and, finally, exploring the use of alcohol, tobacco, and gambling taxes as revenue sources.

Before discussing the specifics of Professor Fox’s article, I believe it is important to first address an underlying issue that may provide additional context to the concerns at hand. Namely, state and local government revenue streams have become more sensitive to economic downturns since World War II. The implications are straightforward and significant—subnational governments will experience more fiscal strain (at least on the revenue side) from a 1 percent decline in economic activity today than they would have from the same decline 30 years ago. This structural change for local governments may partly explain the growing reliance on, or at least movement toward, nontraditional revenue sources.

Although a detailed discussion of why state and local revenue portfolios are becoming more sensitive to downturns is beyond the scope of this commentary, I believe we can look to two broad culprits. First, as Tannenwald (2001) so carefully documents, the U.S. economy has experienced a well-documented shift away from goods toward services in both production and consumption. Combined with the increasing importance of “knowledge-based” production, sales tax bases are shrinking relative to the value of economic activity. This is a serious concern for both state and local policymakers, and several states have attempted to broaden their sales tax bases to include services.²

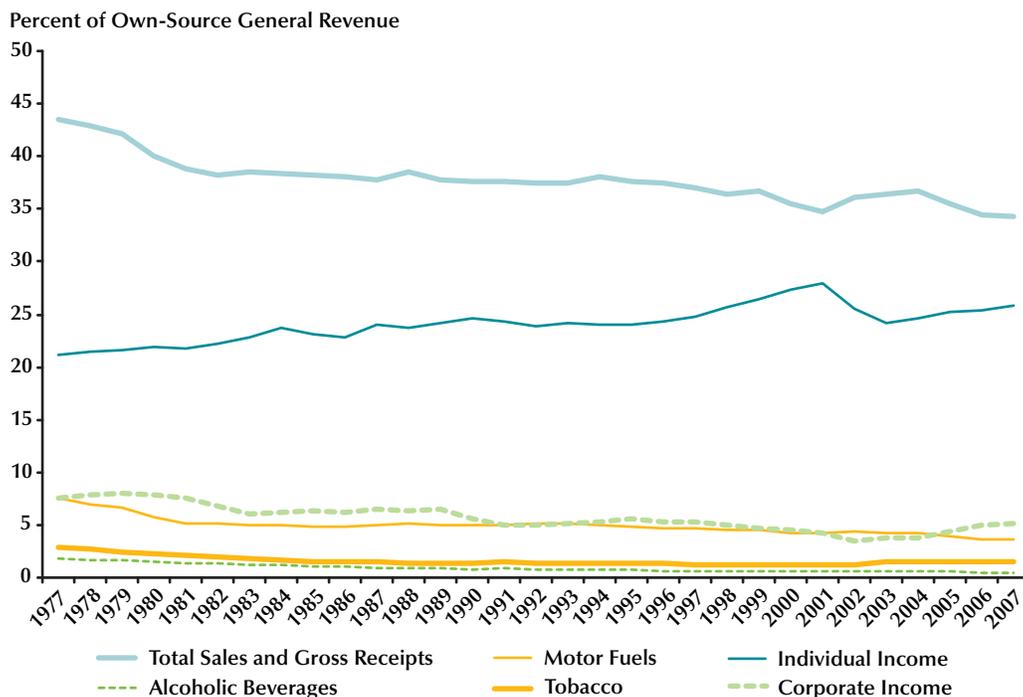
¹ National Governors Association and National Association of State Budget Officers (2010, executive summary, p. viii).

² See Zodrow and Hendrix (2003) and Fox and Murray (1988) for an overview of states’ attempts to broaden their sales tax bases to include services.

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Figure 1**State Own-Source Revenues (1977-2007)**

SOURCE: Data from State & Local Government Finance Query System (www.taxpolicycenter.org/slf-dqs/pages.cfm); the Urban Institute–Brookings Institution Tax Policy Center (www.taxpolicycenter.org/); U.S. Census Bureau, Annual Survey of State and Local Government Finances (www.census.gov/econ/overview/go0400.html); Government Finances, Volume 4; and Census of Governments (www.census.gov/econ/overview/go0100.html).

Second, since World War II, state and local revenue portfolios have become increasingly dependent on revenue sources that vary more over the business cycle. As Figure 1 shows, state governments have become increasingly reliant on individual income tax revenue and less reliant on alcohol, tobacco, and motor fuel tax bases that are significantly less volatile over the business cycle. This trend is even more pronounced in figures dating back to 1950.³ Moreover, a similar picture emerges on the local government front. While

local governments are far less diverse in their revenue sources than state governments, a point noted by Professor Fox, there has been movement away from the highly stable property taxes toward the more volatile user fees/charges (Figure 2).⁴

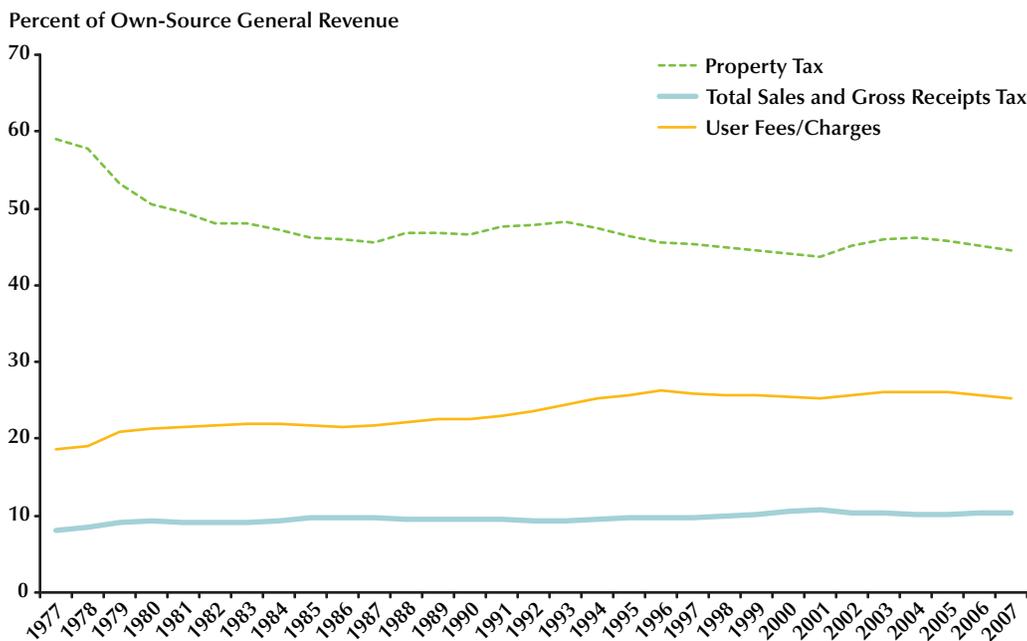
One of the more popular “alternative” tax sources—and the focus of much of Professor Fox’s article—is the use of business GRTs. In its purest form, a GRT is a tax applied to all business income with no deductions for any type of expenses, which is equivalent to a tax on all business profits and costs. Although Professor Fox devotes considerable attention to explaining the (sometimes) subtle dis-

³ The corporate income tax (CIT) also receives attention as a factor in the fiscal stress that states bear. While there is little doubt that changes in business structure (limited liability corporations and so on) and the growing use of business tax incentives have narrowed the corporate tax base, CIT revenue has been a relatively modest source of state revenue over the past 50 years. See Cornia et al. (2005) for an overview of the issues surrounding state CITs.

⁴ Clearly, pressures on the expenditure side of state and local budgets may also contribute to periods of fiscal strain. See Garrett and Wagner (2004) for a more detailed analysis of state expenditure and revenue trends since World War II.

Figure 2

Local Own-Source Revenues (1977-2007)



SOURCE: Data from State & Local Government Finance Data Query System; the Urban Institute–Brookings Institution Tax Policy Center; U.S. Census Bureau, Annual Survey of State and Local Government Finances; Government Finances, Volume 4; and Census of Governments.

inctions among corporate income taxes (CITs), value-added taxes, GRTs, and net receipts taxes, in my opinion, this portion of his paper really centers on the bigger issue of finding the appropriate method to use to tax businesses. Hence, much of my discussion focuses on the GRT in general and some of the pros and cons of the GRT relative to the CIT (currently the most common form of business taxation).

Given that some form of business taxation is necessary so that individuals cannot simply form corporations and be exempt from taxes, the ideal form of business tax would be one that generates a “sufficient” amount of revenue, is relatively stable and grows with the economy, adheres to established principles of equity, and is as efficient as possible. This is not a simple matter in practice because even though a certain tax may perform well by one or more measures, no form of business taxation performs well on *all* measures. The obvious challenge

for policymakers is therefore to weigh the relative performance of various taxes when making a decision, and, I believe, the challenge for public finance economists is to provide the most accurate measures possible in terms of efficiency, equity, and the like.

In addition to Professor Fox’s analysis, several researchers, most recently Mikesell (2007) and Chamberlain and Fleenor (2006), point out several real advantages of a GRT relative to a CIT. Compared with other forms of business taxation, such as value-added taxes and CITs, since a GRT is applied to all (or most) business transactions, the tax base can be larger than the total market value of production (gross domestic product [GDP]). As an illustration, Table 1 shows gross income, taxable income, and nominal GDP figures for Washington State, which has had a GRT for many years.

As the table shows, Washington estimates that the ratio of the total (nominal) value of all transactions to the state’s GDP averaged 1.81 over the

Table 1
Washington State Business and Occupation Tax

Year	Gross income (\$ millions)	Taxable income (\$ millions)	Nominal GDP (\$ millions)	Gross income- to-GDP ratio	Taxable income- to-GDP ratio
1995	289,484	236,991	151,338	1.91	1.57
1996	311,486	253,317	161,760	1.93	1.57
1997	342,802	278,212	178,334	1.92	1.56
1998	351,049	290,606	195,794	1.79	1.48
1999	375,799	307,214	214,375	1.75	1.43
2000	401,638	326,770	221,961	1.81	1.47
2001	398,769	322,006	225,765	1.77	1.43
2002	385,593	312,178	231,463	1.67	1.35
2003	401,014	318,877	240,813	1.67	1.32
2004	444,585	348,867	253,247	1.76	1.38
2005	480,557	381,616	272,734	1.76	1.40
2006	535,121	420,215	289,070	1.85	1.45
2007	591,953	460,102	310,279	1.91	1.48
2008	603,744	464,684	322,778	1.87	1.44
Average (mean)				1.81	1.45

SOURCE: Nominal GDP figures from Bureau of Economic Analysis. Gross income and taxable income figures subject to Washington's business and occupation tax are from the *Quarterly Business Review*, Washington State Department of Revenue (calendar years 1995-2008).

period from 1995 to 2008. Focusing on taxable transactions (since some transactions such as government purchases are exempt), the ratio of taxable transactions to GDP averaged 1.45. This means that the GRT base in Washington is roughly 45 percent larger than GDP and potentially could be as large as 81 percent of GDP!

So, while a GRT base would obviously include all service sector transactions, which has proved problematic for traditional sales taxes, the sheer size of the tax base means that a relatively low tax rate could generate considerable revenues. Furthermore, since a pure GRT is applied to the broadest possible tax base, which is a multiple of the state's GDP, in theory this type of tax should be far more stable than other forms of business taxation over the business cycle.

In a testament to the completeness of his article, Professor Fox also addresses the major concerns of cascading and integration with regard to GRTs. Since the tax is applied to every transaction, products and/or services that require more steps in the

production chain are subject to higher effective tax rates than products or services with fewer steps. Washington State's study,⁵ which Professor Fox also cites, found cascading averaged 2.5 times the statutory tax rate and ranged from 1.4 times all the way up to 6.7 times the statutory tax rate.

In terms of cascading, there are several channels for efficiency losses to occur. According to economic theory, differential tax rates on products or services will be as close to efficient as possible if those rates are based on the product's price elasticities. A GRT applies differential rates based on the number of stages of production, which is unrelated to the product's price elasticity. Moreover, as Mikesell (2007) and Chamberlain and Flenor (2006) note, the cascading may provide an incentive for firms to integrate to avoid the tax, encourage producers to move production chains out of state, or prompt businesses to expand their reliance on out-of-state suppliers. Finally, unlike CITs, GRTs

⁵ The 2002 Washington State Tax Structure Study Committee report.

Table 2
Gambling Shares of Revenue: Top 10 and Bottom 10 States

Top 10	Percent of revenue	Bottom 10	Percent of revenue
Nevada	13.60	Utah	0.0
West Virginia	9.2	Hawaii	0.0
Rhode Island	7.7	Alaska	0.0
South Dakota	6.3	Wyoming	0.0
Delaware	6.1	Alabama	0.0
Indiana	5.5	Arkansas	0.1
Oregon	5.3	Montana	0.2
Missouri	4.5	North Dakota	0.3
Louisiana	4.4	Minnesota	0.4
Illinois	4.2	Nebraska	0.5

SOURCE: Dayayan and Ward (2009).

are completely independent of a company's profitability and therefore unrelated to its ability to pay. The CIT is not without problems, but it is easily plausible that a low-production chain, high-profit margin firm (such as an information technology firm) could face a substantially lower tax rate than a high-production chain, low-profit margin firm.

I want to be clear that I am not arguing against GRTs per se, nor am I advocating for them. My primary concern is this: Given that GRTs are not widespread, in my opinion we have an incomplete understanding of the efficiency losses of such a business tax system relative to the CIT. Combine this with the political appeal associated with a low-rate, broad-base tax, and I fear that policymakers

will move rapidly toward some form of a GRT without a solid understanding of the consequences.

Finally, turning our attention to alcohol, tobacco, and gambling taxes, state and local governments have a long history of generating revenue from these sources. However, as Table 2 and Figure 2 show, for most states, the so-called sin taxes simply do not generate a sizable enough portion of state revenues to be viable, long-term solutions to revenue problems. However, considering that "sin tax" bases tend to range from acyclical to somewhat countercyclical, the use of nontraditional revenue sources can play a key role in balancing state revenue portfolios by reducing short-term variability.

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Panel Discussion: The Future of State and Local Government Finance

Is the Sales Tax Becoming Obsolete?

Robert Tannenwald

Obsolence” is an extreme condition. According to the online Merriam-Webster Dictionary, something becomes obsolete when it is “no longer in use or no longer useful.”¹ By this definition, if the sales tax is becoming obsolete, it is on its way out. New taxes with much broader bases, at least in their theoretically pure form, are the wave of the future. Old taxes such as the sales tax, designed for a twentieth-century economy, will become “extinct” well before the twenty-first century ends.

Such a conclusion is way too premature. Granted, economic change has complicated the task of taxation at all levels of government. State and local policymakers have faced particular difficulty maintaining the revenue productivity of their traditional sources of taxation, including the sales tax. The sales tax is not well designed to capture rapidly growing classes of transactions, such as purchases of services and electronic commerce. However, as discussed further below, countervailing economic forces may be broadening the sales tax base, not narrowing it. Furthermore, policymakers can redesign the sales tax to overcome political, administrative, and legal obstacles to the

expansion of its base. Reviews of new state taxes, such as those recently embraced by Ohio, Texas, and Michigan and considered by California, have been mixed. (See, for example, Fox, Luna, and Murray, 2007; McLure, 2005; Pomp, 2009; Mikesell, 2009; and Hamilton, 2010). Since a clearly superior alternative to the sales tax has yet to emerge, it should not be relegated (nor, for that matter, should other traditional state and local taxes) to the fate of inexorable obsolescence.

My remarks focus solely on two trends noted above that allegedly are undermining the revenue productivity of the sales tax: the growing importance of (i) services and (ii) electronic commerce in the nation’s flows of economic activity. (For discussions of the potential obsolescence of other components of the traditional twentieth-century state and local tax system, see Tannenwald, 2004, and Brunori, 1998, 2001.)

HOW IMPORTANT IS THE SALES TAX IN THE CURRENT SYSTEM?

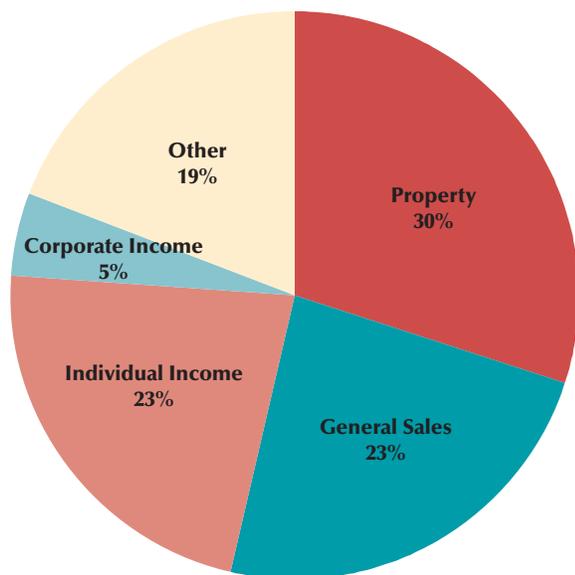
The sales tax accounted for 23 percent of the nation’s state and local taxes in state fiscal year (FY) 2007. The personal income tax accounted for the same percentage, while property tax receipts represented 30 percent of the total pie. The corporate income tax, considered the fourth principal component of the traditional system, accounted for only 5 percent (Figure 1). Since the property tax is largely a local tax, the sales tax is one of the two most important taxes in the states’ tax mix.

¹ www.merriam-webster.com/dictionary/obsolete.

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Figure 1**Composition of State and Local Tax Revenues (FY 2007)**

SOURCE: Author's calculations and U.S. Census Bureau (State and Local Government Finances; www.census.gov/govs/estimate/).

HOW THE TWO TRENDS HAVE ERODED THE SALES TAX BASE

The Growing Importance of Services

Architects of the first state and local sales taxes considered services too difficult to tax. Small firms with little record-keeping capacity delivered the bulk of services. Professional service providers wielded (and still wield) a considerable amount of political clout, shielding them from taxation. Since purchases of goods accounted for the majority of sales, all in all, tax policymakers in most states concluded that extending the sales tax base to services was not worth the bother (Tannenwald, 2004).

However, over the past 50 years, the percentage of consumption accounted for by services has grown dramatically, from just over 41 percent in 1960 to 68 percent in 2009.² Largely as a result, some have alleged that growth in taxable sales has failed to keep up with state and local fiscal needs.

Policymakers have been forced to raise statutory sales tax rates to maintain an adequate flow of sales tax revenues (Bruce and Fox, 2000). At some point, it has been argued, policymakers will hit the limit on statutory rates as they drive consumers to neighboring states or create other severe distortions in economic behavior. Other forms of taxation, such as gross receipts or value-added taxes, will be superior in generating revenue for state coffers.

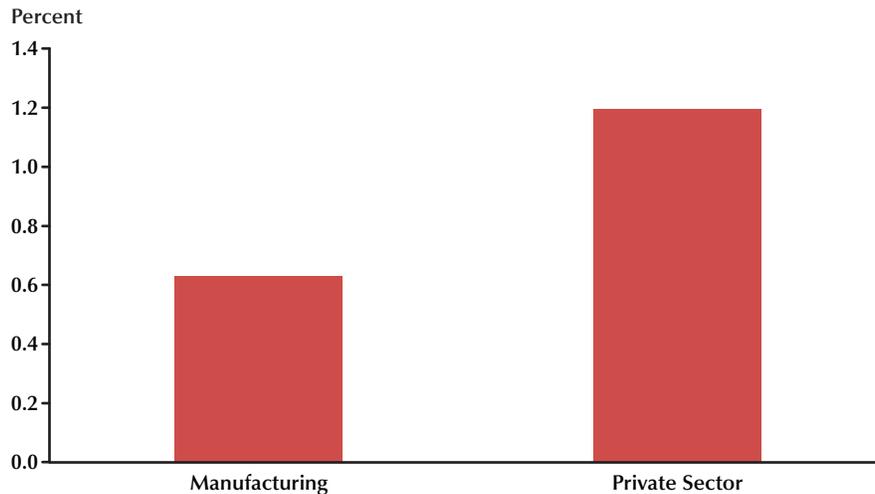
The expanding importance of services in the consumption mix seems at odds with the growing array of electronic “gadgets” found in households across much of the income spectrum: flat-screen TVs, “smart” cell phones, iPods, laptops, printers, fax machines, and CD players, just to name a few. In fact, Americans spend a growing fraction of their income on services because their prices have risen much more rapidly than those of goods. We spend more of each dollar on services largely because goods have become so cheap. In inflation-adjusted terms, in 1970 the ratio of services to goods in consumption was about 2 to 1, roughly the same as it is today.³

Will this trend continue—cheaper and cheaper goods relative to services? At some point, will those producing these progressively cheaper goods—workers in developing nations—begin to garner higher wages? Already, wages are rising in China (MacLeod, 2010). Chinese workers produce more of the goods consumed in the United States than those of any other foreign nation. Granted, technological change and economies of scale will probably keep tamping down costs, but these forces reduce the cost of delivering services, too.

Moreover, purchases of consumer goods and services account for only 60 percent of the nationwide state and local sales tax base. The other 40 percent consists of business-to-business (intermediate) transactions (Phillips et al., 2010). Shifts in the pattern of this latter group of transactions may have broadened the base, offsetting to some degree the impact of the shrinking share of goods in consumption.

² U.S. Bureau of Economic Analysis, National Income and Product Accounts, Table 1.1.1.5 (www.bea.gov/national/nipaweb).

³ Author's calculations from U.S. Bureau of Economic Analysis, National Income and Product Accounts, Table 2.3.6 (www.bea.gov/national/nipaweb).

Figure 2**State and Local Taxes as a Percent of Intermediate Purchases (CY 2008, estimated U.S.)**

SOURCE: Author's calculations; U.S. Bureau of Economic Analysis; Phillips et al. (2010); and Phillips, Cline, and Neubig (2009).

A case in point is the shrinking share of total intermediate purchases made by manufacturers. From 1998 to 2008, their share of private sector intermediate transactions fell from 39 percent to 34 percent.⁴ In taxing intermediate purchases, state and local policymakers have generally favored manufacturers based on the theory that they are the most powerful engines of economic growth. Consequently, a large percentage of their inputs is tax exempt. As evidence of this “pro-manufacturing” bias, Figure 2 presents the ratio of sales taxes paid on intermediate purchases to the total value of those purchases in calendar year (CY) 2008 for manufacturing and the private sector as a whole. The ratio in manufacturing was only half of that in the whole private sector. Thus, because manufacturing’s share of intermediate sales has shrunk,

the economy-wide “effective tax rate” on these sales has risen, contributing to the overall revenue productivity of the sales tax.

The rising effective tax rate on intermediate purchases has not made the sales tax a better tax. Taxing intermediate sales diminishes the tax’s transparency and neutrality (through pyramiding, among other ways). However, every real-world tax departs from the normative principles of taxation. The rising effective tax rate on business-to-business sales, however, enhances the long-run viability of the sales tax by enabling it to generate more revenue. In the future, it might allow policymakers to improve the tax by trading some reduction in the taxation of intermediate sales for extension of the tax base to services consumed by households.⁵

Could this ever happen? Are the political and administrative obstacles to expanding the taxation of services more broadly so great that it is beyond the realm of possibility? Attempts to extend sales tax bases to services over the past 20 years, such as in Florida, Massachusetts, and Maine, have not been

⁴ Author’s calculations and U.S. Bureau of Economic Analysis, Intermediate Inputs by Industry (May 25, 2010, release). Federal Reserve Banks, credit intermediation, and related activities were subtracted from total private sector intermediate inputs. Data can be found in the Industry Account Tables (www.bea.gov/industry/gpotables). Shrinkage since the 1970s or 1980s would have been much greater. Unfortunately, given the change in the industrial classification system from the Standard Industrial Classification (SIC) to the North American Industry Classification System (NAICS) system and other methodological changes, data before 1998 are not available.

⁵ For a discussion of several services that would be good candidates for inclusion in state sales tax bases, see Mazerov (2009).

Panel Discussion

especially successful (Francis, 1988, and Goodman, 2010). However, given the degree to which state and local governments have been compelled to cut badly needed programs (Williams et al., 2010) and the long-standing structural deficits of state and local governments (Lav, McNichol, and Zarahdnik, 2005), the taxation of some services could emerge as one of the more palatable among several unpopular deficit-closing alternatives (Goodman, 2010).

The Proliferation of Electronic Commerce

Over the past eight years, the nation's volume of electronic commerce (e-commerce) has grown at an exponential rate. In 2001, retail e-commerce transactions totaled \$34.4 billion dollars, 1.1 percent of all retail sales. By 2009, the volume of e-sales had jumped to \$143.4 billion, 3.9 percent of the total.⁶ The volume of intermediate-purchase transactions is much higher. In 2006, an estimated 93 percent of all e-commerce consisted of business-to-business purchases (Bruce, Fox, and Luna, 2009).

The rapid proliferation of sales conducted over the Internet threatens to erode state and local sales tax bases because, given the nature of these sales, it is difficult for administrators to detect them and collect the taxes due. A vendor's lack of a physical presence in the customer's state lies at the root of this problem. The Supreme Court has ruled that, absent authorizing federal legislation, a state cannot compel vendors lacking a physical presence within its borders to collect sales taxes on its behalf. In legal terms, a vendor lacks "nexus" with a state if it has no physical presence within the state's boundaries.⁷ As an illustration, if a resident of New York buys a computer through the Internet from a company based in California, the state of New York cannot compel that company to collect New York sales tax on the purchase. Without collection at the point of sale, however, the transaction effectively cannot be taxed (use tax laws notwithstanding). According to a study released in mid-2009, the nationwide loss in e-sales tax

revenue attributable to failure to tax e-sales from vendors lacking nexus will range between \$11.4 billion and \$12.7 billion in FY 2012 (Bruce, Fox, and Luna, 2009). Given these estimates, if state and local general sales tax revenue grew at an annualized rate of 3 percent between CY 2009 and CY 2012, the resulting percentage loss in sales tax revenue attributable to nontaxable e-sales would fall between 2.5 percent and 2.8 percent.⁸

Yet, the taxation of interstate e-sales would be much easier (assuming congressional authorization) if sales taxes were simpler and more uniform across state and local governments. Congress has been reluctant to authorize the sales taxation of interstate e-commerce at the point of sale in part because state and local tax regimes were so numerous, varied, and complicated. Under such conditions, requiring a multistate seller to sort out the taxes owed by every one of its customers in every state would be an overwhelming task. In recognition of this problem, in 1999 the National Governors Association and the National Association of State Legislatures agreed to design a simple model sales tax and urged state and local governments to conform to it and to ratify the Streamlined Sales and Use Tax Agreement (SSUTA). The process of formulating the uniform tax and implementing the Agreement is overseen by the Streamlined Sales Tax Governing Board, Inc. To date, 23 states conform to the Agreement. Legislation calling for conformity has been introduced in 10 others.⁹ Federal legislation that would authorize enforcement of SSUTA was most recently introduced on July 1, 2010, by U.S. Representative Bill Delahunt of Massachusetts.¹⁰

The development of a variety of sophisticated tax software packages has made the tax collection problem even more manageable. If the nation's subnational governments all complied with the

⁶ Author's calculations from U.S. Census Bureau (www.census.gov/retail/mrts/www/data/html/10Q1.html), Table 3.

⁷ *Quill Corp. v. North Dakota*, 504 U.S. 298 (1992). For further discussion of the *Quill* decision, see Hellerstein (2010).

⁸ In the four quarters comprising state FY 2009 (average of 2008:Q3–2009:Q2), nationwide collections from state and local sales tax revenues equaled \$433.4 billion (National Income and Product Accounts, Table 3.3; us.bea.gov/national/nipamet). At an annualized growth rate of 3 percent, state and local sales tax revenues would equal \$460.0 by state FY 2012: $\$11.4/\$460.0 = 0.025$; $\$12.7/\$460.0 = 0.028$.

⁹ See the website of the Streamlined Sales Tax Governing Board, Inc. (www.streamlinedsalestax.org).

¹⁰ Mainstreet Fairness Act. H.R. 5660. 111th Congress, 2D.

SSUTA, this software would give every vendor the capability of determining the state sales taxes due on the sale of any good or service regardless of the customer's location.¹¹

In short, given evolving conditions, Congress should give state and local governments the necessary authority to tax electronic purchases at the point of sale. If it did so, both the revenue productivity and fairness of the sales tax would be enhanced.

CONCLUSION

During the past few years, a few states, such as Ohio, Michigan, and Texas, have adopted a gross receipts tax or something similar. Some consider such a tax or a value-added tax as an important new

component of future state and local taxation, possibly as a partial or full replacement of the corporate income tax, sales tax, or property tax. Yet, as pointed out above, none of these taxes has garnered rave reviews from either tax experts or tax policy-makers. As Mikesell (2009) notes, many states imposed gross receipts taxes between the early 1900s and mid-1960s. Most states repealed them, dissatisfied with the distortions and complexities that they spawned. Furthermore, Cline and Neubig (2010) argue that in considering the introduction of a radically new tax, the burden of proof lies with the proponents of change. In my book, attempts to reform sales taxes—extending their base to consumer services and electronic commerce—are better options than replacing them with radically new tax regimes that look better on paper than in practice.

The general sales tax, although battered, is not becoming obsolete. It will be an integral part of state and local tax systems for a long time to come.

¹¹ A discussion of these software packages can be found at another website sponsored by the Streamlined Sales Tax Board, Inc. (www.sstregister.org/sellers/Entry.aspx).

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State and Local Fiscal Reforms

Chris Edwards

This paper discusses four reforms for state and local governments to consider: abolishing corporate income taxes, privatizing government activities, trimming public sector compensation, and reforming public sector labor laws. These may seem like disparate policy ideas, but the common theme is that governments need to be smaller, more efficient, and more flexible if America is to prosper in an age of intense global competition.

With large budget deficits and huge pension-funding gaps, many state and local governments face major financial challenges. But private businesses and individuals also face financial challenges, especially in a sluggish economy. As such, policymakers should try to reduce the burdens of taxes, spending, and regulations on the private sector. I have identified four areas for improvement, which are discussed in the following sections.

REPEALING STATE CORPORATE INCOME TAXES

Fiscal policy is not concerned just with governments raising enough revenue to match the spending desires of policymakers. That is the case because

merely raising revenue creates distortions that damage the private sector economy. Governments should try to both minimize their funding needs and raise revenues with the least-damaging tax structures. Corporate income taxes are probably the most economically damaging state taxes, at least relative to how much revenue is raised. Policymakers should consider repealing these taxes to improve the efficiency of state fiscal systems.

All states except Nevada, South Dakota, and Wyoming impose corporate income taxes or similar levies such as gross receipts taxes (Padgitt, 2009). State corporate income taxes raised just 2.6 percent of total state revenues and 4.0 percent of state tax revenues, on average, over the past decade (U.S. Bureau of Economic Analysis [BEA], 2010).¹ Thus, states receive little revenue from the corporate income tax, but the tax substantially distorts business decisionmaking and imposes large compliance costs on firms. One study found that business compliance costs for the state corporate tax were about twice as high as for the federal corporate tax relative to tax collected (Slemrod and Blumenthal, 1993). *Tax Notes* editor David Brunori (2002) notes that state corporate income taxes "consume an inordinate amount of intellectual firepower and economic resources in terms of planning, compliance, and administration."

¹ See Table 3.3. Data are shown as the average for 2000 to 2009.

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Panel Discussion

The corporate income tax problem is compounded by the fact that many corporations carry out production, distribution, and other activities in numerous states, all of which want to grab their share of corporate earnings. A three-factor formula of property, payroll, and sales is generally used to “apportion” a firm’s profits among state governments, but varied and inconsistent formulas are used and the definitions of the factors are subject to disputes. The complexity of state corporate taxation is magnified because of uncertainty in the rules for “nexus,” or the standards for how much presence a company must have in a state before it is required to pay taxes.

Businesses must track different income tax rules for every state in which they operate. They must also separate “business income” from “non-business income.” Business income is apportioned among the states, whereas nonbusiness income (such as interest) is assigned to the corporation’s state of commercial domicile. This distinction is complex and subject to legal disputes. Some states allow separate reporting for each company in a corporate group, whereas others require combined reporting for the whole corporate group. States also differ on taxation of firms’ foreign affiliates.

To make it all worse, state policymakers carve out preferences and loopholes in the corporate tax base so it resembles Swiss cheese (Fisher, 2002). Incentive packages for favored companies and fancy credits for job training and other activities have proliferated. Such narrow breaks are unfair to businesses that pay the full tax load, and they expose government officials to corruption as firms lobby for special deals. Even if state corporate taxes were a good idea in theory—and they are not—state politicians have shown that they are incapable of enacting simple corporate taxes in practice.

The other factor to consider is the revolution in corporate taxation around the world during the past three decades (Edwards and Mitchell, 2008). Following Britain’s lead in the mid-1980s, all major economies have cut their corporate tax rates. Just since the mid-1990s, the average top corporate tax rate in the 30-nation Organisation for Economic Co-operation and Development has fallen from 38 percent to 26 percent. During the same period, the average rate in the European Union plunged from

38 percent to 23 percent (KPMG, 2009). The figures in these reports include both national and subnational taxes.

In the United States, the federal corporate tax rate of 35 percent has not been cut in more than two decades. At the state level, the average top rate in the 43 states that currently have corporate income taxes has actually increased slightly since 1980, from 7.0 percent to 7.5 percent today.² As a result, America is in a very uncompetitive position with the second-highest corporate tax rate among industrial countries: 40 percent (including the federal rate and the average state rate). The U.S. rate is 17 percentage points higher than the average rate in the European Union.

As we try to revive the national economy—and as states such as Michigan try to revive their state economies—repealing state corporate income taxes and related levies would be an excellent way to encourage long-term investment and job creation. As corporate profits become more mobile in the global economy, state corporate taxes will become even more difficult to enforce. As Brunori (2002) notes: “The only people who really make money from the state corporate income tax system are the major law firms and big accounting firms.”

States should repeal corporate income taxes and offset any revenue losses by repealing business subsidies and other unwarranted giveaways on the spending side of their budgets. Actually, the corporate tax base has become so responsive in the global economy that governments may not lose any revenue in the long run from corporate income tax repeal because repealing the tax would cause an inflow of investment, which would generate higher state revenue from other types of taxes (Edwards, 2007). Either way, states should throw in the towel on the corporate income tax.

PRIVATIZATION OF GOVERNMENT ACTIVITIES

In recent decades, governments on every continent have sold major state-owned assets to private

² Author’s calculations based on data from the Tax Foundation and Federation of Tax Administrators. This excludes the states with gross receipts taxes instead of income taxes.

investors. Airports, railroads, energy utilities, highways, and other assets have been privatized. The privatization revolution has overthrown the belief widely held in the twentieth century that governments should own the most important industries in the economy. Privatization can often reduce costs, improve service quality, and increase innovation in formerly moribund government industries.

Privatization of state government assets makes sense for many reasons. First, asset sales can help cut state debt levels. Second, privatization can reduce the responsibilities of governments so that policymakers can better focus on their core activities. Third, there is vast foreign privatization experience on which to draw in pursuing U.S. reforms. Fourth, privatization would spur economic growth by opening new markets to entrepreneurs and promoting innovation to industries.

Transportation infrastructure is one of the most promising areas for privatization reforms. Before the twentieth century, transportation infrastructure was usually financed and built by the private sector. More than 2,000 companies built private toll roads in America in the eighteenth and early nineteenth centuries (Klein, 1994). Most of these roads were put out of business by the spread of the railroads, which were also mainly privately financed. Then entrepreneurs financed and built networks of electric streetcars in America beginning in the 1880s, with systems installed in more than 850 American cities (O'Toole, 2009, p. 136). Until the early 1960s, urban mass transit in the United States was mainly provided by private bus companies (O'Toole, 2009, p. 138).

Almost any service supported by customer fees and advertising can be privatized. A big advantage of privatized infrastructure is that private companies can freely tap debt and equity markets for capital expansion to meet rising demand. By contrast, government infrastructure is subject to the politics and uncertainties of government budgeting processes. As a consequence, government infrastructure projects are often old, congested, and poorly maintained.

Today, several states are moving ahead with privately financed and operated highways. The Dulles Greenway in northern Virginia is a 14-mile private toll highway opened in 1995, which was

financed by private bond and equity issues. In the same region, Fluor-Transurban is building and mainly funding high-occupancy toll lanes on a 14-mile stretch of the Capital Beltway. Drivers will pay to use the lanes with electronic tolling, which will recoup the company's roughly \$1 billion investment.

How about airports? Nearly all major U.S. airports are owned by state and local governments. By contrast, airports have been fully or partly privatized in many foreign cities, including Athens, Auckland, Brussels, Copenhagen, Frankfurt, London, Melbourne, Naples, Rome, Sydney, and Vienna. Britain led the way with the 1987 privatization of British Airports Authority, which owns Heathrow and other airports. A recent survey identified 100 companies around the world that own and operate airports, finance airport privatization, or participate in projects to finance and operate new airport terminals (Bentley, 2008).

In the United States, there is some growing interest in airport privatization, or at least in leasing airport operations to private contractors. Chicago has been close to finalizing a deal on privatizing Midway airport, for example, but the financial crisis has postponed that plan for now (Merrion, 2010). In 2009, a \$140 million privately financed, built, and operated airport opened near Branson, Missouri, for commercial flights by AirTran and other carriers.

Seaports, which in the United States are virtually all owned by state and local governments, represent another potential area of privatization. Many U.S. ports do not operate at top efficiency levels because of inflexible union work rules and other factors. A U.S. Maritime Administration report in 2005 found that "American ports lag well behind other international transportation gateways such as Singapore and Rotterdam in terms of productivity" (U.S. Department of Transportation, 2005, p. 28). Numerous countries around the world have privatized their seaports. One Hong Kong company, Hutchison Whampoa, owns 30 ports in 19 countries. In Britain, 19 ports were privatized in 1983 to form Associated British Ports; today about two-thirds of British cargo goes through private ports.³

³ See www.abports.co.uk.

Panel Discussion

What is America waiting for? Privatization would allow state governments to raise funds from asset sales to reduce their debt loads. Private firms could more easily gather financing for new capital investments than governments, which are always complaining that they are cash strapped. And because of the vital role played by highways, airports, and seaports in the economy and international trade, privatization should be a high-priority reform area for states to foster greater economic growth.

REFORMING PUBLIC SECTOR COMPENSATION

With large budget gaps in many states, substantial savings could be gained by cutting the generous compensation packages of the nation's 20 million state and local workers. In 2009, wages and benefits of non-federal government workers totaled \$1.1 trillion, which accounted for half of total state and local government spending (BEA, 2009b).⁴

Are state and local workers overpaid? A comparison of the average compensation per hour worked in state and local governments with that for U.S. private sector jobs can help answer this question. According to the Bureau of Labor Statistics (BLS), public sector compensation averaged \$39.66 per hour in 2009, which was 45 percent higher than the private sector average (BLS, 2009a).⁵ Looking just at wages, the public sector advantage was 34 percent. However, a recent job-for-job comparison of private sector and state and local workers by *USA Today* showed that wages were similar, on average (Cauchon, 2010).

It is the benefits side of state and local government compensation that is out of line. Health and pension benefits are excessive. The BLS data show that public sector benefits per hour are 70 percent higher than in the private sector. In addition, public sector workers receive one high-value non-monetary benefit: very high job security. "Layoffs and discharges" in the public sector occur at just

one-third the rate of the private sector in good times and bad (BLS, 2009b).

Public sector pension benefits are receiving a great deal of media scrutiny—and for good reasons. As baby boomers in public sector workforces retire, the large and underfunded (or overpromised) benefits in government pensions are starting to have a big impact on state and local budgets. Also, media articles have revealed many pension abuses in states across the nation.⁶

In 2009, employer-provided pension plans were available to 99 percent of full-time state and local workers but just 74 percent of full-time private workers (BLS, 2010b, Table 1).⁷ Public sector pension plans are generally much more generous than private plans. One study found that the median public sector defined-benefit plan paid benefits more than twice as high as the median private plan (Pew Center on the States, 2007, p. 11).

State and local pension plans have a funding gap of about \$1 trillion, according to official estimates.⁸ But those estimates understate the poor shape of pension plans because they rely on optimistic assumptions to value future liabilities. A recent study by Robert Novy-Marx and Joshua Rauh (2009) found that governments are "severely underestimating" their pension liabilities by the use of high discount rates. Using more realistic assumptions, the authors found that state and local pensions were underfunded by \$3.2 trillion. At more than \$27,000 for every U.S. household, that figure indicates a huge exposure for state and local taxpayers.

Factors driving up costs in public sector defined-benefit plans include the following:

- *Early retirement.* Public sector workers generally retire earlier than private sector workers and enjoy generous pension benefits for life indexed for inflation. They can typically retire at age 55 after 30 years of work, as in California's Public Employees' Retirement System (CalPERS) system (Dohm, 2000, p. 21). In CalPERS, workers receive an annual

⁴ See Tables 3.3 and 6.2D.

⁵ These data include full-time and part-time workers (see Tables 3 and 5).

⁶ See PensionWatch (www.pensionsunami.com) for recent articles.

⁷ See Employee Benefits Survey (www.bls.gov/ncs/ebs).

⁸ Calculated by Novy-Marx and Rauh (2009).

pension equal to 60 percent of their final salary after 30 years. Public safety workers in CalPERS can retire at age 50 after 30 years of work with benefits equal to 90 percent of their final salary. These lucrative benefits have put CalPERS in deep financial trouble.

- *Pension formulas.* Virtually all public sector plans calculate benefits based on pay during the last one to three years of work. Private plans are more likely to use a lower-cost approach, such as the last five years of pay or career-average pay (Foster, 1998). Also, public plans typically have a more generous factor to adjust pension benefits for number of years worked. In the public sector, benefits equal to about 60 percent of pay after 30 years of work is typical. In some jurisdictions, government workers inflate or “spike” their pension earnings by receiving big raises or working overtime in their final year or two on the job.⁹
- *Double dipping.* In California, New Jersey, Utah, and other states, public workers can “retire” early and then either resume their existing job or take a new job, thus receiving a salary and pension at the same time (Heath, 2009).
- *Disability claims.* Excessive and fraudulent disability claims are a growing problem. In Nevada, “[F]iremen hobbled by heart disease can collect an inflation-protected \$40,000 a year for life on top of their pension. That applies even if they’re healthy enough to work in another occupation” (Fitch, 2009). Walters (2007) notes that “hundreds of local governments and several states are wrestling with what some view as out-of-control disability pension and health insurance systems hard-wired to allow police and fire personnel to retire early and with very generous benefits. At the same time, they may pursue other full-time careers.”
- *Excessive benefits.* News articles have revealed eye-popping annual pension

amounts received by civil servants in run-of-the-mill positions in cities across the nation. In California, 6,144 of the retired public employees in the CalPERS plan and 3,090 of the retired teachers in the state teachers’ plan receive annual pension benefits of more than \$100,000.¹⁰

Excessive pension benefits are creating a looming crisis for government budgets and state taxpayers. To make matters worse, governments have also built up large unfunded costs in their retiree health care plans, a type of benefit that is rare in the private sector. With a colleague, I estimated that state and local health obligations are underfunded (or overpromised) by at least \$1.4 trillion, or about \$12,000 per U.S. household (Edwards and Gokhale, 2006).

A final looming threat to taxpayers is the large amount of bond debt that governments are accumulating. Total state and local bond debt jumped 92 percent between 2000 and 2009—from \$1.2 trillion to \$2.3 trillion (Federal Reserve Board of Governors, 2009; see Table D.3). Governments are using debt to fund investments formerly funded on a pay-as-you-go basis, and some governments are using debt to paper over routine budget shortfalls, which is the height of fiscal irresponsibility.

Policymakers should stop piling costs onto the next generation of young taxpayers. Government spending should be cut and bond debt reduced. New state and local employees should be offered defined-contribution plans, not defined-benefit plans. Pension and health care premiums for state and local workers should be increased. Retirement ages and years-of-service requirements for pensions should be raised. Pension and health care benefits should be cut. Government staffing levels should be reduced. This may all sound quite drastic to some folks, but the huge structural gaps in government finances will not go away without dramatic action on the spending side of budgets.

⁹ For example, see Revel et al. (2004).

¹⁰ For information on the CalPERS and California State Teachers Retirement System (CalSTRS) \$100,000 clubs, see <http://californiapensionreform.com>.

REFORMING PUBLIC SECTOR UNION LAWS

Spending reforms, such as privatization and cuts to employee compensation, often face substantial political opposition. Reforms are more difficult to achieve, particularly in states with union participation in their public sector workforces. Public sector unions have a substantial effect on state fiscal policies through aggressive lobbying, particularly in states that allow public sector collective bargaining and forced union dues.

In 2009, 39 percent of state and local public sector workers were members of unions—more than five times the 7 percent share in the private sector (BLS, 2010a). Before the 1960s, unions represented less than 15 percent of the state and local workforce (Freeman, 1986, p. 45). At that time, courts generally held that under the 1935 Wagner Act, public sector workers did not have the same union privileges—such as collective bargaining—as did private workers.

That viewpoint changed during the 1960s and 1970s, as a flood of pro-union laws in dozens of states triggered a dramatic rise in public sector unionism (Freeman, 1986, pp. 47 and 48). Many states passed laws (i) encouraging collective bargaining in the public sector and (ii) imposing compulsory union dues and fees.

Today, about 26 states have collective bargaining for essentially all state and local workers. An additional 12 states have collective bargaining for a portion of their state and local workers. The remaining 12 or so states do not have collective bargaining in the public sector (Government Accountability Office, 2002, p. 8).¹¹

The union shares of state and local workforces vary widely and are strongly correlated with state rules regarding collective bargaining (Edwards, 2010a). The rules range from states that actively require it, to states that allow it, to states that ban it (such as Virginia and North Carolina). In states that require collective bargaining, at least 50 percent of public workers are unionized. In states with no collective bargaining, public sector union membership averages just 17 percent (Farber, 2005, p. 20).

¹¹ These totals have changed a bit since this 2002 study.

State union shares are also correlated with “agency shop” rules. Agency shop rules require workers to either join the union or pay a fee to the union. Today, 28 states have agency shop rules, whereas 22 are “right-to-work” states where workers cannot be forced to join a union or pay union fees.¹² Right-to-work states generally have much lower union shares in their workforces (Farber, 2005, p. 22).

Union public sector workers have much higher average wages and benefits than nonunion public sector workers. Specifically, BLS data show that union members have a 31 percent advantage in wages and a 68 percent advantage in benefits over nonunion members (Edwards, 2010e). However, part of this union-nonunion pay difference stems from general labor market variations across states. States with generally higher wages tend to be more unionized. Analyses that hold constant such cross-state differences find that public sector unions increase average pay levels by roughly 10 percent.¹³

Besides raising compensation costs, unions reduce government efficiency in other ways. Unions tend to protect poorly performing workers, they often push for larger staffing levels than required, and they discourage the use of volunteers in government activities. Unions also tend to resist the introduction of new technologies and create a more rule-laden workplace. Simple regression analyses show that states with higher union shares in the government workforce have more government debt and receive poorer grades on public management, based on Pew Center research criteria.¹⁴

A final type of inefficiency created by public sector unions is the cost of strikes in those states that allow it. In November 2009, for example, transit workers in Philadelphia went on a six-day strike over disagreements regarding pay, which created chaos for 800,000 residents of the city who rely on government rail and bus services (Lattanzio, 2009).

In the private sector, businesses can mitigate such union-caused inefficiencies. In response to

¹² See National Right to Work (www.nrtw.org/rtws.htm).

¹³ See Edwards (2010a,b).

¹⁴ See Edwards (2010c,d).

union demands for higher pay, for example, businesses can substitute capital for labor. Unfortunately, public sector managers have little incentive or flexibility to make such changes.

Public sector unions have a broad effect on fiscal policy, as they are some of the nation's most powerful special interest groups. The National Education Association (NEA), the American Federation of Teachers (AFT), the American Federation of State, County and Municipal Employees (AFSCME), and the Service Employees International Union (SEIU) have more than 7 million members combined, and they are very well financed. The NEA and AFT, for example, collect about \$2 billion per year in member dues and fees, most of which is from jurisdictions with agency shop rules (National Institute for Labor Relations Research, 2008).

With their large war chests, public sector unions are active in political campaigns. Over the past two decades, AFSCME was the second-largest contributor to campaigns in the United States. The NEA was the eighth largest, the SEIU eleventh largest, and the AFT thirteenth largest (Center for Responsive Politics). During 2007 and 2008, public sector unions spent \$165 million on campaigns and ballot measures (National Institute on Money in State Politics).

These groups generally favor increases in government spending, partly because they personally benefit from expanded programs. In states such as California and Oregon, they have spent millions of dollars on various ballot measures, nearly always favoring the side of higher taxes and spending. Public sector unions fight against school choice, privatization, and many other policies that can improve government efficiency.

To conclude, collective bargaining gives a privileged position in our democracy to government insiders who focus on expanding the public sector to their personal benefit. Monopolies in the business world usually create higher-cost and lower-quality services. Monopoly unions create similar problems in labor markets. With the many large fiscal challenges facing governments—such as huge pension-funding gaps—policymakers need flexibility to make tough budget decisions. But powerful unions make budget reforms more difficult.

To put citizens and taxpayers back in control of their governments, collective bargaining and forced union dues should be outlawed in the public sector, following the successful policies of Virginia and North Carolina. Public employees should be free to join worker associations, but they should not be given a special legal status and handed extra power to block needed fiscal reforms.

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