

Discussion Papers

State Fiscal Systems and Business Cycles

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99-04

Implications for State
Welfare Spending
When the Next
Recession Occurs



Assessing
the New
Federalism

*An Urban Institute
Program to Assess
Changing Social Policies*

Assessing the New Federalism

Assessing the New Federalism is a multi-year Urban Institute project designed to analyze the devolution of responsibility for social programs from the federal government to the states, focusing primarily on health care, income security, employment and training programs, and social services. Alan Weil is the project director. Researchers monitor program changes and fiscal developments. In collaboration with Child Trends, the project studies changes in family well-being. The project aims to provide timely, nonpartisan information to inform public debate and to help state and local decisionmakers carry out their new responsibilities more effectively.

Key components of the project include a household survey, studies of policies in 13 states, and a database with information on all states and the District of Columbia, available at the Urban Institute's Web site. This paper is one in a series of discussion papers analyzing information from these and other sources.

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Introduction

With the 1996 Personal Responsibility and Work Opportunity Reconciliation Act, the federal government dramatically changed its partnership with the states for financing state welfare expenditures. Previously, the federal government provided matching grants to states in the form of Aid to Families with Dependent Children (AFDC) at an average rate of 60 percent, with poorer states receiving a higher matching rate than richer states. Under the new law, states receive block grants for Temporary Assistance for Needy Families (TANF), so that they now bear the full impact of money spent on income-support programs above the amount financed by the federal block grant.¹

The 1996 act set the level of the block grants at the amount of the matching grants for fiscal year 1994. Because the matching grants in 1994 were relatively generous and the states' economies have been solid (or even booming) since then, states have had little trouble financing welfare programs under the new regime. Given that the federal block grants are essentially fixed, a question on everyone's mind is, What will happen to state welfare spending when the next recession occurs?

In an attempt to provide a partial answer to this question, we examine the recent history of fiscal responses of the states to business cycles. In previous work (Dye and McGuire, 1998) we examined the two major revenue sources of state governments: the individual income tax and the general sales tax. We were able to approximate policy-free measures of these two taxes, in other words, measures that hold the tax rules constant. Using these policy-free measures we estimate cyclical elasticities for each tax for each state. In this paper, because we are interested in expenditures as well as revenues of state governments, and because we are unable to calculate policy-free measures of expenditures, we present a different set of calculations. We calculate the elasticities of different categories of real revenues and

expenditures with respect to real gross state product (GSP) using actual revenue and spending data.

The use of actual budget data combines automatic revenue and spending responses to changes in economic conditions with revenue and spending policy changes, some of which are likely responses to changes in economic conditions. While based on historical data in a period predating the 1996 welfare legislation, the information is valuable as it reflects states' actual experiences with and responses to economic cycles. Because this measure of responsiveness reflects policy preferences, it is arguably of more interest than policy-free elasticity measures.

The remainder of the paper is organized as follows: The following section is a description of state revenue and expenditure systems and of state business cycles as measured by percent changes in GSP. The next section presents calculations of elasticities of revenues and expenditures over a long time period and, because of our interest in recessions, over just the years of negative growth in GSP. The final section summarizes our findings and draws policy implications.

State Revenues and Expenditures and State Business Cycles

States receive revenues from a variety of sources. Just under 30 percent of state general revenues come in the form of grants-in-aid from the federal government. Although it is changes in the structure of federal grants that trigger our interest in the cyclicity of state revenue systems, those structural changes mean that an analysis of historical levels of, or cycles in, federal grants would provide little insight into the future. The impact of moving to block grants for welfare is that state own-source revenues will have to service any cyclical expenditure needs in the state budgets associated with TANF in the future.

Table 1 presents information on the major state taxes.² Taxes represent on average about three-quarters of total own-source general revenues for the states.³ In 1995–96 the average level of total taxes per capita was \$1,583 (see the last row of table 1). Of these revenues, approximately one-third each was attributable to the individual income tax and the general sales tax. The two next largest contributors to tax revenues were the corporate income tax and the motor fuel tax, each contributing less than 10 percent of total taxes. Several states, including Idaho, Illinois, Kansas, and Pennsylvania, mirrored the U.S. average in level and mix of taxes in 1995–96. There were notable outliers. Florida is one of nine states with no (or a minuscule) individual income tax,⁴ which resulted in nearly 60 percent of its total tax revenues coming from its general sales tax in 1995–96. New Hampshire had the lowest level of total taxes per capita, reflecting its abhorrence of taxes in general and state taxes in particular and its tradition of relying on local governments for financing most public services. Massachusetts and New York had much higher than average levels of taxes per capita and relied much more heavily than average on the individual income tax. Our hypothesis is that these differences in the states' tax systems will be reflected in different fiscal responses to economic cycles.

Table 2 presents similar information on state expenditures.⁵ In 1995–96, the U.S. average level of total general expenditures per capita was \$2,853, with public welfare comprising one-quarter and K–12 education just over one-fifth of the total. Illinois and Indiana, two neighboring states, had very similar total expenditures per capita but allocated spending across categories quite differently. Indiana allocated 40 percent to K–12 and higher education combined, whereas Illinois allocated just over 25 percent to education. Illinois spent more than 30 percent of its total on public welfare, greater than the U.S. average of 26 percent and much greater than Indiana's 22 percent share. New York was (and

still is) notable for its very high spending per capita and its very high allocation to public welfare. Texas had one of the lowest levels of spending but allocated its total among the categories in a fashion similar to the U.S. average. Public welfare, which includes Medicaid spending, was clearly an important spending category for every state.

Our interest is in the revenue and spending responses of states over the business cycle in general and during recessionary years in particular. Table 3 presents information on the business cycles for the 50 states and the United States from 1977 to 1995. The first column displays the correlations between year-to-year percentage changes in real GSP for each of the states and year-to-year percentage changes in real gross domestic product (GDP) for the United States. The correlations were less than 70 percent for 21 states, and were even negative for 4 states. The second column lists the years in which recessions (defined as negative growth in GSP or GDP) occurred. The United States experienced recessions in three years: 1980, 1982, and 1991. Only one state, Illinois, shared this precise pattern of recession years. California experienced recession in three consecutive years in the early 1990s. West Virginia and Wyoming shared the dubious distinction of experiencing recession in the greatest number of years (nine), while Florida experienced no recession over this period. The depth of recession varied as much across the states as the timing. The third column displays the arithmetic average of the percentage declines in GSP calculated over the recession years for each state and the United States. The United States experienced an average decline of 1.1 percent during its three years of recession. The range was great across the states — from -0.3 percent for Georgia and Virginia to -10.7 percent for Alaska. These figures convinced us that we need to focus on state cycles and recessions rather than U.S. business cycles if we want to provide meaningful answers to the question posed at the outset. They

Table 1
State Taxes in Fiscal Year 1995–96

State	Population (millions)	Total Tax Revenue (\$ per capita)	Revenues as Percentage of Total Tax Revenue			
			Individual Income Tax (%)	Corporate Income Tax (%)	General Sales Tax (%)	Motor Fuel Tax (%)
Alabama	4.27	1,230	30.0	4.1	27.4	8.8
Alaska	0.61	2,503	0.0	21.5	0.0	2.5
Arizona	4.43	1,447	23.3	7.0	42.4	7.8
Arkansas	2.51	1,478	31.3	6.2	37.1	8.9
California	31.88	1,811	36.0	10.1	32.9	4.7
Colorado	3.82	1,261	47.2	4.3	27.4	9.2
Connecticut	3.27	2,391	33.4	8.2	31.2	6.4
Delaware	0.72	2,329	37.4	9.8	0.0	5.6
Florida	14.40	1,368	0.0	5.1	58.0	6.8
Georgia	7.35	1,400	41.2	7.0	37.2	5.3
Hawaii	1.18	2,601	32.5	2.1	46.5	2.5
Idaho	1.19	1,561	35.3	8.2	32.3	8.6
Illinois	11.85	1,458	33.5	9.4	29.3	6.9
Indiana	5.84	1,445	41.2	10.6	34.0	7.3
Iowa	2.85	1,557	35.8	4.6	32.8	8.3
Kansas	2.57	1,547	34.6	6.4	35.2	7.4
Kentucky	3.88	1,671	32.0	4.4	27.5	6.2
Louisiana	4.35	1,128	23.6	6.7	33.1	10.2
Maine	1.24	1,525	37.4	3.7	34.7	8.2
Maryland	5.07	1,610	42.7	4.0	24.5	7.4
Massachusetts	6.09	2,044	53.8	9.9	21.0	4.8
Michigan	9.59	1,994	30.7	11.4	34.4	4.1
Minnesota	4.66	2,199	40.4	6.9	28.3	5.1
Mississippi	2.72	1,421	19.2	5.2	47.5	9.2
Missouri	5.36	1,346	38.0	5.9	34.2	7.8
Montana	0.88	1,429	30.5	6.0	0.0	14.0
Nebraska	1.65	1,434	35.5	5.4	34.4	11.4
Nevada	1.60	1,802	0.0	0.0	54.4	6.8
New Hampshire	1.16	720	6.2	21.5	0.0	12.8
New Jersey	7.99	1,801	32.9	8.0	30.0	3.2
New Mexico	1.71	1,786	21.0	5.3	41.9	7.4
New York	18.18	1,878	50.9	8.0	20.4	1.5
North Carolina	7.32	1,623	41.5	7.9	25.0	8.0
North Dakota	0.64	1,531	15.4	7.5	28.6	9.7
Ohio	11.17	1,401	37.7	5.2	31.9	7.7
Oklahoma	3.30	1,399	32.8	3.5	26.2	7.4
Oregon	3.20	1,378	63.9	6.8	0.0	8.6
Pennsylvania	12.06	1,517	28.5	8.2	31.2	4.2
Rhode Island	0.99	1,564	37.5	5.6	30.0	8.1
South Carolina	3.70	1,382	35.5	4.9	37.5	6.3
South Dakota	0.73	997	0.0	5.2	52.5	12.3
Tennessee	5.32	1,163	1.9	8.6	57.2	11.6
Texas	19.13	1,112	0.0	0.0	50.8	10.9
Utah	2.00	1,457	39.1	6.1	40.2	7.1
Vermont	0.59	1,429	33.4	5.3	21.7	7.0
Virginia	6.68	1,333	48.3	4.1	22.4	7.9
Washington	5.53	1,913	0.0	0.0	58.4	6.4
West Virginia	1.83	1,518	27.1	8.5	28.8	7.4
Wisconsin	5.16	1,995	47.2	6.0	26.3	6.5
Wyoming	0.48	1,300	0.0	0.0	33.7	6.9
United States	264.74	1,583	32.1	7.0	33.2	6.2

Table 2
State Expenditures in Fiscal Year 1995-96

State	Population (millions)	Total Tax Revenue (\$ per capita)	Expenditures as Percentage of Total General Expenditures						
			K-12 Education (%)	Higher Education (%)	Public Welfare (%)	Health & Hospitals (%)	Highways (%)	Corrections (%)	Interest (%)
Alabama	4.27	2,572	24.1	17.0	21.2	12.1	8.0	2.0	2.0
Alaska	0.61	8,410	16.9	6.2	14.0	3.7	12.2	2.9	4.7
Arizona	4.43	2,443	20.4	12.3	24.1	5.5	10.6	4.6	1.7
Arkansas	2.51	2,582	20.7	13.1	24.4	9.1	10.8	2.6	1.9
California	31.88	3,099	24.3	8.9	29.2	8.4	4.6	3.9	2.5
Colorado	3.82	2,329	20.8	20.2	23.4	4.3	8.9	4.0	3.8
Connecticut	3.27	3,584	15.0	7.6	24.0	11.4	6.1	4.0	7.8
Delaware	0.72	4,036	13.7	15.5	15.8	7.2	8.8	3.8	9.2
Florida	14.40	2,335	23.2	7.2	21.8	7.8	9.6	4.9	3.3
Georgia	7.35	2,528	25.0	12.8	24.9	6.9	6.6	4.4	1.9
Hawaii	1.18	4,418	18.1	11.1	17.5	9.3	5.2	2.0	6.4
Idaho	1.19	2,592	25.5	14.7	17.1	3.4	11.2	3.2	3.0
Illinois	11.85	2,540	16.6	9.4	31.2	7.7	8.1	2.9	5.0
Indiana	5.84	2,469	20.1	20.0	21.9	4.2	10.6	2.6	1.9
Iowa	2.85	2,869	22.6	14.5	20.9	8.5	12.8	2.3	1.5
Kansas	2.57	2,597	28.0	14.0	16.5	8.5	14.9	2.9	1.1
Kentucky	3.88	2,730	22.4	13.3	26.1	6.0	10.0	2.1	3.5
Louisiana	4.35	2,894	19.6	12.4	23.6	11.9	6.8	3.1	5.9
Maine	1.24	3,004	15.9	10.5	33.6	6.3	9.7	1.7	4.6
Maryland	5.07	2,633	15.9	11.9	21.9	8.0	9.1	5.6	4.4
Massachusetts	6.09	3,741	11.0	6.6	26.3	9.6	7.9	3.2	7.5
Michigan	9.59	3,298	28.2	12.9	20.4	10.8	6.1	3.9	2.2
Minnesota	4.66	3,381	22.4	11.9	26.2	7.1	7.7	1.9	1.8
Mississippi	2.72	2,738	22.9	11.1	22.3	8.4	9.7	3.1	1.8
Missouri	5.36	2,193	23.4	11.6	24.7	8.8	9.8	2.7	2.6
Montana	0.88	3,104	19.6	13.6	18.7	6.2	12.5	2.4	5.0
Nebraska	1.65	2,615	16.9	16.0	22.6	11.6	13.3	2.2	2.0
Nevada	1.60	2,510	25.2	11.9	16.2	3.5	9.9	3.7	3.2
New Hampshire	1.16	2,444	5.7	12.7	34.8	5.1	7.9	2.2	13.2
New Jersey	7.99	3,259	19.7	7.8	25.9	6.1	7.0	3.4	5.1
New Mexico	1.71	3,631	23.7	14.0	18.0	9.3	10.5	2.8	1.8
New York	18.18	3,787	16.6	6.3	38.0	9.3	4.1	3.5	4.9
North Carolina	7.32	2,651	25.5	13.7	22.8	8.1	8.9	4.5	1.3
North Dakota	0.64	2,891	15.4	20.1	19.4	4.5	11.3	0.9	2.9
Ohio	11.17	2,550	20.7	12.9	25.9	8.0	7.7	4.0	2.9
Oklahoma	3.30	2,397	26.0	16.0	21.0	7.5	10.5	3.7	2.0
Oregon	3.20	3,007	23.3	10.5	22.0	8.4	9.7	3.0	3.6
Pennsylvania	12.06	2,748	16.7	11.0	29.7	9.1	7.3	3.3	3.3
Rhode Island	0.99	3,434	13.5	9.5	25.9	9.8	6.2	3.4	8.7
South Carolina	3.70	2,888	18.7	14.3	23.9	12.2	5.8	3.7	1.7
South Dakota	0.73	2,541	13.5	12.6	21.1	5.7	14.2	2.4	5.8
Tennessee	5.32	2,422	17.5	14.7	30.7	8.2	9.6	3.5	1.5
Texas	19.13	2,171	26.1	13.4	25.6	7.4	8.6	5.7	1.8
Utah	2.00	2,831	25.1	21.2	16.8	7.8	6.3	2.8	2.3
Vermont	0.59	3,258	12.6	16.3	26.9	3.2	9.8	2.2	5.5
Virginia	6.68	2,443	19.0	16.0	17.9	9.9	12.3	5.0	3.4
Washington	5.53	3,179	25.3	14.7	21.6	8.0	8.2	2.8	2.9
West Virginia	1.83	3,080	22.0	12.0	28.2	3.6	12.5	1.5	2.9
Wisconsin	5.16	2,956	20.3	12.4	20.9	6.4	7.7	3.4	3.6
Wyoming	0.48	3,753	24.1	10.2	14.0	6.5	15.0	1.8	3.0
United States	264.74	2,853	21.1	11.3	25.9	8.2	7.7	3.6	3.4

Table 3
Cycle Correlations and Recession Years* in the 50 States and the United States
1977-1995

State	Correlation Between Percentage Change in Real GSP and Percentage Change in Real United States GDP	Recession or Negative Growth Years	Average Percentage Change in Real GSP in Negative Growth Years (%)
Alabama	0.82	80, 82, 89	-2.2
Alaska	-0.12	83, 86, 88, 91, 92, 93, 94	-10.7
Arizona	0.79	82, 90	-1.8
Arkansas	0.76	80, 82, 85, 90	-2.0
California	0.72	91, 92, 93	-1.0
Colorado	0.35	86	-0.9
Connecticut	0.68	91	-2.5
Delaware	0.41	80, 93, 94	-1.1
Florida	0.77	none	N/A
Georgia	0.82	80	-0.3
Hawaii	0.26	81, 93, 94, 95	-1.5
Idaho	0.66	80, 81, 82, 86	-3.1
Illinois	0.90	80, 82, 91	-3.3
Indiana	0.88	80, 81, 82, 90, 91	-3.3
Iowa	0.78	80, 82, 83, 85, 86, 91	-3.6
Kansas	0.65	80, 82, 86	-1.8
Kentucky	0.87	80, 82	-3.1
Louisiana	0.04	82, 83, 85, 86, 87, 89, 91, 92	-4.8
Maine	0.64	90, 91	-3.2
Maryland	0.76	80, 82, 91, 92	-0.8
Massachusetts	0.70	90, 91	-3.6
Michigan	0.84	79, 80, 82, 90, 91	-4.9
Minnesota	0.89	80, 82, 90, 91	-1.4
Mississippi	0.71	80, 82, 90	-2.1
Missouri	0.81	80, 82, 90	-3.1
Montana	0.38	82, 83, 85, 86, 87, 88	-2.5
Nebraska	0.73	80, 82, 83, 86	-3.2
Nevada	0.73	82	-1.5
New Hampshire	0.65	89, 90	-2.8
New Jersey	0.73	80, 90, 91	-0.4
New Mexico	-0.10	82, 83, 86, 87, 95	-2.7
New York	0.72	80, 91	-1.3
North Carolina	0.89	80, 82, 90	-1.1
North Dakota	0.28	80, 82, 83, 85, 86, 88, 91, 93	-5.3
Ohio	0.92	80, 81, 82, 91	-3.1
Oklahoma	-0.14	83, 85, 86, 87, 89, 91	-4.0
Oregon	0.81	80, 81, 82	-5.0
Pennsylvania	0.88	80, 81, 82	-2.5
Rhode Island	0.69	80, 82, 90, 91	-1.2
South Carolina	0.88	80, 82	-1.5
South Dakota	0.68	80, 82	-6.9
Tennessee	0.79	80, 82, 90	-2.8
Texas	0.08	82, 83, 86, 87	-3.0
Utah	0.48	82, 86	-1.8
Vermont	0.78	82, 90, 91, 95	-1.5
Virginia	0.76	91	-0.3
Washington	0.69	80, 82	-1.4
West Virginia	0.54	80, 81, 82, 83, 85, 86, 89, 90, 91	-1.7
Wisconsin	0.88	80, 81, 82	-2.6
Wyoming	-0.05	82, 83, 85, 86, 87, 89, 91, 92, 94	-5.6
			Avg. % Ch. Real GDP
United States		80, 82, 91	-1.1

* Recession defined as years of negative growth in real GSP (or, for the United States, negative growth in real GDP).

suggest that the next recession will occur at different times and with different strengths for the different states.

Elasticities of State Revenues and Expenditures

From information on the historical responses of actual state revenues and expenditures to business cycles we can infer something about the constraints, parameters, preferences, and possibilities the states face during times of economic upheaval. Table 4 presents estimates of the elasticity of the two major taxes and total taxes with respect to real GSP over an 18-year period.⁶ The real GSP observations are calendar year and are lagged a half year behind the real tax collection observations, which are measured in fiscal years. We lag GSP to allow time for policy responses to changed economic conditions and because of the institutional lags in fiscal realizations.⁷

We emphasize that these elasticities are estimated using actual taxes, which reflect tax rate and tax base changes over time, as opposed to estimates based on data for fixed-structure taxes. In the absence of policy changes, we would expect the elasticities for income and sales taxes to be close to one, as taxable income and personal consumption track GSP fairly closely, and significantly greater than one for progressive income tax structures. And in fact, this is what we find in the estimates of policy-free tax elasticities in Dye and McGuire (1998). We expect policy changes to mute the elasticities of actual taxes relative to the elasticities of fixed-structure taxes, as state policymakers lower taxes in good times and raise them in bad times. This is what we find in table 4. The aggregated U.S. elasticities for the individual income tax, the general sales tax, and total tax collections are 0.27, 0.66, and 0.41, respectively, with only the sales tax elasticity significantly greater than zero. For the individual income

tax,⁸ the 13 states with elasticities significantly different from zero have elasticities in a wide range (from -4.81 for New Mexico⁹ to 1.39 for Hawaii). One explanation of a negative elasticity for the individual income tax is a policy response involving decreases in taxes during good times and increases in taxes during bad times. Most of the significant elasticities in table 4, and all of the significant elasticities for total tax collections, are positive, indicating that taxes and GSP move together when there is a significant relationship between the two variables. We infer from these results that the positive relationship between the bases of the various taxes and GSP is not typically overwhelmed by counter-cyclical policy changes, but it is greatly muted. For example, the fixed-policy elasticity of California's income tax structure is estimated to be 1.68 in Dye and McGuire (1998), but it is 0.76 here.

Table 5 presents elasticity estimates for major categories of state expenditures. We expect to find zero or positive elasticities for total expenditures: zero elasticities if policymakers try to hold spending roughly constant over the cycle; positive elasticities if policymakers adjust to the revenue cycle with increased spending during good times and decreased spending during bad times. Education spending, especially for higher education, tends to be somewhat discretionary for state policymakers. We thus expect to find positive elasticities for the two education categories. Welfare spending tends to be counter-cyclical, and thus we expect to find negative elasticities. On average for the United States, these expectations are generally confirmed by the results in table 5. For total nonwelfare expenditures, several estimated elasticities are positive and significant, with a range among the significant estimates of 0.25 to 1.42 and an average of 0.62 . The elasticities for public welfare and AFDC are negative for the United States and statistically significant, and the estimates for the two education categories are positive (K–12 education) and zero (higher education). When we examine specific states and focus only on the

Table 4
Cyclical Elasticity of Real Tax Collections (fiscal 1977–78 to 1995–96)
with Respect to Real GSP (calendar 1977 to 1995)
by State and by Type of Tax

State	Individual Income Tax	General Sales Tax	Total Tax Collections
Alabama	-0.18	0.65 **	0.28
Alaska	N/A	N/A	1.14 **
Arizona	-0.13	1.06 **	0.50 **
Arkansas	0.34	1.06 **	0.60 *
California	0.76	0.35	0.40
Colorado	0.24	0.60	0.13
Connecticut	-4.60 *	1.64 **	0.13
Delaware	-0.07	N/A	0.15
Florida	N/A	1.31 **	0.68 *
Georgia	0.57 **	0.61	0.88 **
Hawaii	1.39 *	0.84 **	0.83 **
Idaho	-0.12	0.19	0.18
Illinois	-0.11	1.31 **	0.79 **
Indiana	0.09	0.55	0.45
Iowa	0.23	-0.22	0.23
Kansas	-0.20	-0.66	-0.25
Kentucky	0.03	0.63 *	0.46
Louisiana	-0.63	0.45	0.55 **
Maine	1.17 **	0.47	0.78 **
Maryland	0.87 **	0.86 **	0.82 **
Massachusetts	0.46 *	1.22 **	0.69 **
Michigan	0.48	0.99 **	0.82 **
Minnesota	-0.76	-0.07	-0.10
Mississippi	-1.51	0.79 *	0.39
Missouri	1.31 *	0.66	0.94 **
Montana	-0.10	N/A	1.07 **
Nebraska	0.33	-0.91 **	-0.31
Nevada	N/A	0.45	0.07
New Hampshire	N/A	N/A	0.00
New Jersey	0.20	0.29	0.03
New Mexico	-4.81 *	-0.23	-0.07
New York	0.59	0.79 **	0.47
North Carolina	0.86 **	0.90 *	0.70 **
North Dakota	-2.04 **	0.02	0.42
Ohio	-0.90	0.27	0.11
Oklahoma	0.97 **	0.60	0.93 **
Oregon	0.15	N/A	0.42
Pennsylvania	-0.27	0.75 **	-0.19
Rhode Island	-0.23	1.20 **	0.42
South Carolina	0.28	1.27 **	0.78 **
South Dakota	N/A	0.53	0.12
Tennessee	N/A	1.22 **	0.93 **
Texas	N/A	-0.07	0.27
Utah	-0.13	0.25	0.02
Vermont	0.94 *	-0.26	0.24
Virginia	0.86 **	0.67 **	1.01 **
Washington	N/A	-0.87	-0.24
West Virginia	0.48	-0.09	0.11
Wisconsin	-0.38	-0.31	-0.12
Wyoming	N/A	0.93 **	1.06 **
United States	0.27	0.66 **	0.41

Note: N/A = not applicable.

* Significantly different from zero at the 10 percent confidence level.

** Significantly different from zero at the 5 percent confidence level.

Table 5
Cyclical Elasticity of Real Expenditures (fiscal 1977–78 to 1995–96)
with Respect to Real GSP (calendar 1977 to 1995)
by State and by Type of Expenditure

State	Total Nonwelfare	Public Welfare	AFDC (to 94–95)	K–12 Education	Higher Education
Alabama	-0.05	0.14	-0.20	0.47	-0.01
Alaska	0.23	0.10	-0.17	-0.04	0.39 **
Arizona	0.50 *	-1.13	-1.57 **	0.12	0.38
Arkansas	0.56	-0.18	-0.19	0.45	0.68
California	0.92 *	-0.50	-0.17	1.83 **	-0.07
Colorado	-0.02	-0.73	-2.17 **	0.20	-0.45
Connecticut	1.42 **	-0.59	-0.79	0.79 **	0.44
Delaware	0.24	1.45	0.39	0.35	0.18
Florida	1.12 **	0.39	-2.88 **	0.79	1.21
Georgia	0.85 **	-1.00 **	-1.14 **	0.64	0.80
Hawaii	0.88 **	-0.45	-0.44	0.34	0.18
Idaho	0.30	0.42	0.57	0.64	0.08
Illinois	0.69 *	0.17	-0.47	0.96 **	-0.10
Indiana	0.47 **	-0.45	-0.48	0.68 **	-0.06
Iowa	0.25 *	0.23	-0.66 *	0.15	-0.03
Kansas	0.11	-0.60	0.26	0.59	-1.74 *
Kentucky	0.22	-0.20	-0.50	-0.34	0.20
Louisiana	0.11	0.01	-0.33	0.00	0.13
Maine	0.77 **	-0.66 **	0.16	1.08 **	0.39
Maryland	0.53 *	-0.44	-0.93	0.45	-0.19
Massachusetts	1.02 **	0.17	0.12	1.60 **	1.17 **
Michigan	0.85 **	-0.29	-0.43	1.47 *	0.29
Minnesota	0.61	-0.61	-0.53	1.37	-0.10
Mississippi	0.64 **	0.32	0.27	0.50	0.36
Missouri	0.40	-0.52	-0.46	0.16	0.30
Montana	-0.65	-0.07	-1.18 **	-0.81	-0.38
Nebraska	0.27	0.00	-0.75 **	-1.06	0.40
Nevada	-0.11	-0.57	0.56	0.50	0.69
New Hampshire	0.34	-1.32	-1.80 **	0.18	-0.02
New Jersey	0.57	-0.62	-2.23	0.59	0.98 **
New Mexico	0.45 **	0.18	0.34	0.36 **	0.94 *
New York	0.43	-0.32	-0.96	-0.56	0.36
North Carolina	0.66 **	-0.23	-0.09	0.25	0.96 **
North Dakota	0.25	-0.49	-0.62 **	0.61 **	-0.26
Ohio	0.04	-1.14 **	-0.69	0.48	-0.19
Oklahoma	0.65 **	0.08	-1.00 **	0.89 **	0.82 **
Oregon	0.34	1.16 **	0.87	1.12 *	0.35
Pennsylvania	0.04	-1.23	0.90	0.58	-1.15
Rhode Island	-0.11	-0.85	-0.22	0.50	0.25
South Carolina	0.99 **	-0.67	0.06	0.98 **	1.07 **
South Dakota	0.13	-0.04	0.40	-0.27	0.52
Tennessee	0.56 *	0.42	-0.21	1.13 *	-0.18
Texas	0.33 *	-0.89 *	-1.50 **	0.30	0.31
Utah	0.66 *	-0.16	-0.92	0.59 **	0.35
Vermont	0.32	-0.49	-0.86	0.60	0.66 **
Virginia	1.05 **	-0.81	-0.98	0.51	1.19 **
Washington	0.35	0.29	-0.27	0.45	0.53
West Virginia	0.31	-0.35	-0.87	-0.07	0.74
Wisconsin	0.58	0.14	-1.03	0.09	-0.11
Wyoming	0.44 **	0.38	-0.28	0.06	0.24
United States	0.62 **	-0.86 *	-0.96 *	0.78 **	0.00

* Significantly different from zero at the 10 percent confidence level.

** Significantly different from zero at the 5 percent confidence level.

statistically significant elasticities, we find additional support for our prior expectations. In particular, for the 11 states with significant estimates for AFDC elasticity, all the elasticities are negative, indicating counter-cyclical spending. Of the 24 statistically significant estimates across the two education categories, all but one are positive, implying that education spending is pro-cyclical and thus perhaps discretionary for many states.

The results in tables 4 and 5 are derived using data for the entire 18-year period and thus reflect state fiscal responses during both good and bad economic times. In the final set of results we turn our attention exclusively to periods of recession. Recall from table 3 that only one state, Florida, had no years of recession during the period 1977 to 1995. Five other states had only one year of recession. Four states, on the other hand, experienced recession at least eight years during the period. Tables 6 and 7 present real revenue and expenditure elasticities calculated using recession years only. For example, the figures presented for the United States are calculated using revenue, expenditure, and GSP changes for the three years that the United States experienced recessions. The elasticities are calculated as simple ratios of recession-year average percentage changes in real revenues or expenditures divided by recession-year average percentage changes in real GSP.¹⁰ If there were no policy changes during the recessions, we would expect to find positive elasticities in table 6 — when GSP declines, revenues should decline with it. We do find positive elasticities for many states (for about half the states for the general sales tax), but we find negative elasticities for many states for each tax, especially the income tax, and the elasticities are negative on average for the United States. The negative elasticities suggest that states enact policy changes to *increase* taxes when GSP decreases, perhaps in an effort to maintain expenditures at prerecession levels.

Table 7 tells a similarly interesting story about expenditure policy responses to recessions. In the absence of policy changes, we expect to find zero or positive elasticities for three of the five categories of spending analyzed — total nonwelfare, K–12 education, and higher education — reflecting the positive income elasticity expected for these largely discretionary types of spending. For public welfare and AFDC, on the other hand, we expect spending and GSP to be negatively related, as AFDC and Medicaid caseloads increase with economic downturns. In fact we find negative elasticities for many states for each category of spending, not just for AFDC and public welfare, and negative elasticities for the United States across the board. Negative elasticities for total nonwelfare spending, K–12 education spending, and higher education spending may reflect counter-cyclical policy changes; in other words, policymakers may have *increased* spending on these categories during recession years. Again, like the results for taxes in table 6, these results may indicate a desire to maintain spending levels (or spending per caseload) at prerecession levels.¹¹

Because the calculated elasticities combine several separate effects, interpretation of our results is problematic. The elasticity estimates reflect automatic responses of spending or revenues to changes in aggregate economic activity, changes in caseloads and income distribution and other determinants of spending and revenues, and changes in policy as policymakers respond to changes in aggregate economic activity. For example, our factual finding of a negative recession-year elasticity for United States higher education expenditures indicates only that, on average, spending on higher education increases when GSP falls. Whether this finding can be attributed to automatic increases in higher education spending during recession, to increases in the number of students at higher education institutions during recession, or to changes implemented by policymakers in response to recession is

Table 6
Recession-Year Elasticity* of Real Tax Revenues
with Respect to Real GSP
by State and by Type of Tax

State	Individual Income Tax	General Sales Tax	Total Tax Collections
Alabama	-4.43	0.64	-1.20
Alaska	N/A	N/A	0.83
Arizona	-4.59	-0.51	-2.66
Arkansas	-0.41	0.38	0.30
California	1.14	-2.84	-0.84
Colorado**	-5.47	6.15	-6.52
Connecticut**	-52.66	7.12	-6.61
Delaware	-1.81	N/A	-3.16
Florida	N/A	N/A	N/A
Georgia**	-28.40	3.52	-3.95
Hawaii	3.65	-0.19	0.65
Idaho	-1.22	-1.10	-0.95
Illinois	0.91	1.37	1.15
Indiana	-2.09	0.67	-0.27
Iowa	-0.67	-1.09	-0.48
Kansas	-5.29	-4.29	-1.88
Kentucky	-0.34	0.48	0.51
Louisiana	-1.73	0.62	0.63
Maine	0.75	-0.85	-0.03
Maryland	-1.08	-2.00	-2.61
Massachusetts	-0.24	0.75	0.14
Michigan	1.02	0.12	0.65
Minnesota	-3.32	-2.48	-1.25
Mississippi	-5.61	1.16	-0.18
Missouri	-1.16	0.38	0.04
Montana	-2.30	N/A	-0.09
Nebraska	0.31	-1.44	-0.57
Nevada**	N/A	4.05	-0.18
New Hampshire	N/A	N/A	1.12
New Jersey	-27.62	-10.81	-22.74
New Mexico	-19.21	-0.99	-1.68
New York	-1.16	0.80	-0.88
North Carolina	-1.12	2.88	1.37
North Dakota	-1.60	-0.44	0.10
Ohio	-3.72	-1.24	-1.39
Oklahoma	-0.07	-0.77	0.44
Oregon	-0.78	N/A	-0.07
Pennsylvania	-0.11	0.30	0.53
Rhode Island	-6.87	2.21	-0.68
South Carolina	-4.27	-0.08	-0.97
South Dakota	N/A	0.65	0.35
Tennessee	N/A	0.59	0.87
Texas	N/A	-2.62	-1.00
Utah	-3.69	1.68	-0.13
Vermont	-1.28	-6.52	-2.27
Virginia**	0.39	6.47	0.74
Washington	0.00	-6.47	-3.87
West Virginia	-1.81	-1.24	-0.89
Wisconsin	0.00	-2.00	-0.66
Wyoming	N/A	1.03	1.18
United States	-2.38	-0.88	-1.41

Note: N/A = not applicable

* Calculated for negative growth years only as the average percentage change in fiscal-year taxes divided by the average percentage change in GSP for the calendar year six months prior to the fiscal year.

** Calculated from only one recession year.

Table 7
Recession-Year Elasticity* of Real Expenditures
with Respect to Real GSP
by State and by Type of Expenditure

State	Total Nonwelfare	Public Welfare	AFDC (1977-1995)	K-12 Education	Higher Education
Alabama	-1.76	-1.88	3.92	0.54	-1.22
Alaska	-0.01	-0.86	-0.58	-0.28	0.24
Arizona	2.28	-7.61	-11.26	-3.37	3.58
Arkansas	-1.28	-3.63	0.85	-0.79	-2.35
California	-1.23	-10.99	-0.70	2.18	0.94
Colorado**	-4.08	-8.94	-7.51	-0.39	-8.33
Connecticut**	2.17	-5.32	-2.16	-1.91	-2.58
Delaware	-4.20	-5.86	7.97	-2.48	-0.23
Florida	N/A	N/A	N/A	N/A	N/A
Georgia**	11.63	-48.52	-22.19	18.00	-21.74
Hawaii	1.42	-4.31	-0.16	-0.82	1.30
Idaho	0.29	0.71	2.48	0.69	-0.96
Illinois	0.81	-2.11	0.33	1.78	-0.20
Indiana	0.12	-2.59	-0.29	0.40	-0.95
Iowa	-0.17	-0.63	-0.01	-0.02	-0.74
Kansas	-0.14	-3.22	0.27	-0.13	-1.94
Kentucky	-0.06	-2.15	0.25	-1.25	-0.12
Louisiana	-0.51	-1.29	0.03	-0.68	-0.66
Maine	-0.25	-4.91	-1.42	-0.25	-0.12
Maryland	1.55	-12.02	4.45	0.13	-4.75
Massachusetts	0.83	-1.05	-1.51	3.08	-0.39
Michigan	0.13	-1.00	-0.23	0.12	-0.11
Minnesota	2.78	-7.89	-3.60	9.82	-0.12
Mississippi	0.46	-1.40	1.28	1.34	-1.21
Missouri	-0.79	-3.15	-0.53	-0.79	-1.01
Montana	-1.18	-2.18	-2.27	-2.83	-0.08
Nebraska	-0.55	-1.52	-0.43	-3.39	-0.87
Nevada**	-2.21	1.36	14.60	-1.95	1.60
New Hampshire	1.04	-4.00	-9.68	-0.25	0.40
New Jersey	-19.02	-48.28	6.43	-12.66	-4.08
New Mexico	-0.40	-2.75	-0.38	-0.54	0.89
New York	-1.30	-4.43	-0.22	-7.05	2.37
North Carolina	-1.45	-7.60	-3.69	-2.92	0.53
North Dakota	-0.18	-1.71	0.06	-0.12	-0.82
Ohio	-0.75	-3.20	-0.08	0.14	-1.62
Oklahoma	-0.13	-1.35	-1.35	-0.05	-0.17
Oregon	-0.07	1.59	3.81	0.71	0.65
Pennsylvania	-0.23	-0.78	3.26	1.87	-1.60
Rhode Island	-4.44	-5.94	-4.07	0.17	-1.13
South Carolina	-0.48	-1.34	1.32	0.05	1.99
South Dakota	-0.13	-0.09	1.35	-0.74	0.71
Tennessee	-0.17	-2.08	-0.33	0.01	-1.97
Texas	-0.51	-2.91	-4.47	-0.34	-0.86
Utah	-2.68	-5.29	-3.55	-1.82	-2.28
Vermont	-2.15	-4.74	-4.26	-2.76	-0.49
Virginia**	8.57	-40.25	-30.36	12.57	5.25
Washington	-4.89	-4.05	4.12	-2.08	0.59
West Virginia	-0.33	-6.16	-1.10	-1.86	-0.88
Wisconsin	-0.38	-0.35	-1.72	-1.77	-0.65
Wyoming	0.06	-0.84	-0.68	-0.87	0.02
United States	-1.68	-7.58	-1.27	-1.02	-3.01

Note: N/A = not applicable.

* Calculated for negative growth years only as the average percentage change in fiscal-year spending divided by the average percentage change in GSP for the calendar year six months prior to the fiscal year.

** Calculated from only one recession year.

difficult to ascertain from our analysis of budget variables. This study has revealed that state revenues and expenditures tend to be counter-cyclical during recession years. However, to further our understanding, an examination is needed of changes by state in caseloads, benefit levels, and policy structures.

Summary of Findings and Policy Implications

An examination of state revenues, expenditures, and economic cycles over a recent 18-year period leads to the following findings:

- the business cycles and recessionary periods of the states differed in timing and strength from the cycles and recessions of the United States;
- over the long, term real tax collections and real GSP tended to move together;
- over the long term, the relationship between nonwelfare categories of real spending, including K–12 education and GSP, was pro-cyclical, while spending on public welfare and AFDC was counter-cyclical;
- during recession years, policymakers in many states appeared to increase both taxes (especially income taxes) and expenditures, perhaps in an effort to maintain prerecession spending levels.

This last finding can be applied to the question posed at the beginning: What will happen to state welfare spending when the next recession occurs? One interpretation of the counter-cyclical findings in table 7 is that in many states, policymakers protected spending essentially across the board during recessionary times. Whether we examine K–12 education or AFDC, we find that many states increased spending when GSP declined. While the history of state revenues and expenditures during recessionary periods indicates that most states will increase taxes in order to maintain spending (including welfare spending), the change in funding responsibility for welfare (from matching AFDC to

block-granted TANF) leads us to be cautious about extending this conclusion to welfare spending. On the other hand, several states demonstrated counter-cyclical spending policies during recent recessions for categories of spending that have never been supported by federal matching grants. It seems reasonable to expect these states to continue to exhibit counter-cyclical spending across the board in the future.

References

- Brueckner, Jan K. 1998. Welfare reform and interstate welfare competition: Theory and evidence, Occasional Paper Number 21. Washington, D.C.: The Urban Institute, December.
- Chernick, Howard. 1998. Fiscal effects of block grants for the needy: An interpretation of the evidence. International Tax and Public Finance 5(2): 205–233.
- Dye, Richard F., and Therese J. McGuire. 1998. Block grants and the sensitivity of state revenues to recession. 1997 proceedings of the National Tax Association. Washington, D.C.
- Mattoon, Richard H., and William A. Testa. 1992. State and local governments' reaction to recession. *Economic perspectives*. Chicago: Federal Reserve Bank of Chicago.
- McGuire, Therese J. 1997. Intergovernmental fiscal relations and social welfare policy. In Intergovernmental Fiscal Relations, edited by Ronald C. Fisher, 173–198. Boston: Kluwer Academic.
- Sobel, Russell S., and Randall G. Holcombe. 1996. Measuring the growth and variability of tax bases over the business cycle." National Tax Journal 49(4; Dec.): 535–552.
- U.S. Department of Commerce, Bureau of the Census. State government finances in [year]. Washington, D.C.: U.S. Government Printing Office, various years; recent years from www.census.gov/govs/state/.
- U.S. Department of Commerce, Bureau of the Census. State government tax collections in [year]. Washington, D.C.: U.S. Government Printing Office, various years; recent years from www.census.gov/govs/statetax/.

¹Several authors have recently reviewed and interpreted the literature on block grants to draw implications for state spending under the new federal grant structure. See, for example, Chernick (1998). Brueckner (1998) and McGuire (1997) have reviewed the theoretical and empirical literature pertaining to the fiscal federalism of welfare policy.

²The tax data for this table and the calculations in tables 4 and 6 are from U.S. Bureau of the Census, *State Government Tax Collections*.

³The other one-quarter is “charges and miscellaneous general revenues.” While this is an important and growing source of state revenues, it is a mixture of many smaller components—tuition at state universities, highway tolls, admissions to state parks, rents, royalties, net lottery revenues, and a number of others—and is difficult to analyze using state aggregates.

⁴New Hampshire and Tennessee have special taxes on interest and dividends but no general individual income taxes.

⁵The expenditure data for this table and the calculations in tables 5 and 7 are from U.S. Bureau of the Census, *State Government Finances*.

⁶The elasticity is the percentage change in taxes when there is a 1 percent change in GSP. We use a measure of short-run elasticity proposed by Sobel and Holcombe (1996), obtained by regressing the change in the log of real taxes on the change in the log of real GSP and a constant.

⁷We estimated the equations with 18-month lags as well and obtained similar results.

⁸Donald Boyd of the Center for the Study of the States, SUNY Albany, notes that there are special problems in estimating and interpreting real income tax elasticities, given that in many states the rate brackets, standard deductions, and personal exemptions are unindexed nominal amounts.

⁹We again emphasize that these elasticities reflect changes in actual tax collections, including policy changes. In the case of New Mexico, Anthony Popp of New Mexico State University and Laird Graeser of the New Mexico Taxation and Revenue Department indicated in conversations that for much of this period their state had a small income tax that was being used to distribute surpluses from severance tax collections, resulting in highly counter-cyclical income tax revenues.

¹⁰Again, as with tables 4 and 5, the GSP observations are lagged six months behind the revenue and expenditure observations.

¹¹Our findings are consistent with the results in Mattoon and Testa (1992). They examine state and local revenues and expenditures during each contractionary period since World War II and find that state and local fiscal behavior has been counter-cyclical, in that expenditures have risen relative to revenues during each downturn.

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