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Source: *Journal of Political Economy*, Vol. 102, No. 4 (Aug., 1994), pp. 799-821
Published by: The University of Chicago Press
Stable URL: https://www.jstor.org/stable/2138765
Accessed: 12-06-2020 02:18 UTC

State Responses to Fiscal Crises: The Effects of Budgetary Institutions and Politics

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This paper explores the dynamics of state taxes and spending during the late 1980s, when regional economic downturns and increased expenditure demands led to substantial state budget deficits. More restrictive state fiscal institutions, such as "no-deficit-carryover" rules and tax and expenditure limitations, are correlated with more rapid fiscal adjustment to unexpected deficits. Political factors are also important. When a single party controls the state house and the governorship, deficit adjustment is much faster than when party control is divided. In gubernatorial election years, tax increases and spending cuts are both significantly smaller than at other times.

The late 1980s and early 1990s were a period of fiscal stress for U.S. state governments. In fiscal year 1991, for example, 22 states reported revenues below their initial expectations, and 20 states faced expenditures in excess of budgetary projections. Unlike the federal government, most states are constitutionally prohibited from using deficit finance over any prolonged period. State fiscal crises therefore require politicians to make hard choices, raising taxes or reducing

outlays to restore fiscal balance. The states provide a laboratory for studying how fiscal institutions and political factors affect taxes and spending. If institutions such as balanced-budget amendments re- strict the flexibility of political actors, then states with and without these laws should respond differently to revenue shortfalls and outlay overruns.

This paper develops new estimates of the unexpected fiscal shocks that states confronted during the 1988–92 period and then analyzes the tax and expenditure adjustments that were associated with these shocks. The paper is divided into five sections. Section I presents background information on state fiscal conditions, focusing on the cross-sectional variation in state budgetary shocks. Section II explores the simple dynamics of state budgetary adjustment, testing whether states adjust outlays and taxes in response to deficits and whether statutory and constitutional rules prohibiting state deficits are bind- ing. It shows that at least half of an unexpected deficit is typically corrected, within the fiscal year, through tax increases and spending cuts.

Section III considers how various budgetary institutions such as no-deficit-carryover rules and tax and expenditure limits affect the dynamics of state revenue and expenditure adjustment. The results suggest that tighter fiscal constitutions are associated with more rapid adjustment to adverse fiscal shocks. Section IV focuses on political circumstances and finds that when one political party controls deci- sion making in a state, adjustment to fiscal shocks is faster than when the governorship and legislature are controlled by different parties. It also explores the link between gubernatorial election cycles and the use of tax increases or spending cuts to address budget deficits. Sec- tion V suggests several directions for future work.

I. State Fiscal Conditions

The fiscal condition of states and localities varied dramatically during the 1980–93 period. In the early 1980s, states and localities were near fiscal balance.[1] During the mid-1980s, they ran large surpluses. In 1984, for example, their surplus excluding social insurance funds was $19.8 billion. Fiscal conditions changed again by the late 1980s.

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[1] The National Income and Product Accounts report a surplus for states and locali- ties throughout the 1980s, because they combine the surplus or deficit from general government operations with the persistent surplus in state social insurance funds. States typically have very limited discretion over the net revenue flow to social insur- ance funds, and most studies of the fiscal position of the state and local sector, such as Gramlich (1991), exclude social insurance funds.

By 1991, Sullivan (1993) reported a state and local deficit of $43.1 billion.

Most of the deterioration in the fiscal position of states and localities has been concentrated at the state level. State deficits in the early 1990s were the result of many forces.[2] One clear influence was the coincident recession, which was concentrated in a few regions and slowed revenue growth sharply for many states. Kusko and Rubin (1993) show that even on a full-employment basis, however, the aggregate state and local sector ran substantial deficits during the late 1980s and early 1990s. Another factor contributing to fiscal stress was the reduction in real federal grants to states and localities. These grants, which accounted for 25 percent of state revenue at the beginning of the 1980s, were only 20 percent of the total in the early 1990s. Unrestricted block grants were largely replaced by federal matching grants during this period.

Revenue reductions in the late 1980s and early 1990s coincided with rising state spending needs. The growing elderly population, combined with real increases in health care costs of several percent each year, substantially raised outlays for health care and related services. Rising crime rates and sentencing reforms, particularly the spread of mandatory sentencing laws, swelled the need for prison space. In California, for example, real prison outlays grew 250 percent between 1980 and 1992. Fiscal problems in large cities also shunted responsibility for some traditionally local services onto the states.

Fiscal stress resulted in historic state tax increases. The combined (1992 dollars) tax increase in fiscal years 1991 and 1992, $26.6 billion, exceeded the tax increase in any previous 2-year period.[3] The $15.5 billion increase in fiscal year 1991 alone was only slightly smaller than the largest previous 1-year change, $15.6 billion in fiscal year 1972, when state fiscal stress prompted the introduction of federal revenue sharing.

To place changing state fiscal conditions in perspective, figure 1 shows aggregate state general fund balances as a share of state spending. These funds expand after states experience unexpected surpluses and can be drawn down to cover unexpected deficits. A balance equal to 5 percent of spending is generally regarded as an acceptable cushion against revenue and expenditure fluctuations. The figure

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[2] Gold (1990), Moore (1991), Dye and McGuire (1992), and Blackley and DeBoer (1993) discuss the sources of state fiscal difficulties in more detail.

[3] Data on tax increases are drawn from various issues of *Significant Features of Fiscal Federalism* (Advisory Commission on Intergovernmental Relations) and publications of the National Association of State Budget Officers.
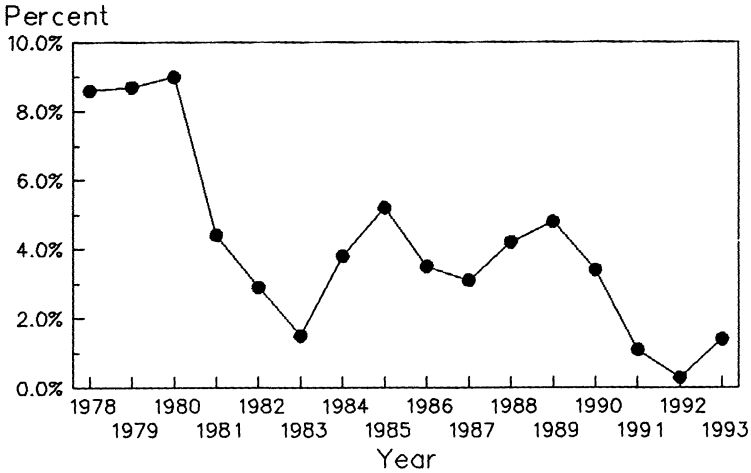
Percent

FIG. 1.—Total year-end balances as a percentage of expenditures, 1979–93.
Source: NASBO, *Fiscal Survey of the States* (1992).

indicates unusual state fiscal weakness in the early 1990s. The balance
at the end of fiscal year 1992, 0.3 percent of total expenditures, was
lower than at any time since the National Association of State Budget
Officers began collecting these data in the late 1970s.

The aggregate pattern in figure 1 conceals substantial dispersion
in fiscal conditions across states. In fiscal year 1992, for example, 10
states reported deficits of more than $1 billion, whereas others such
as Oregon and West Virginia had large surpluses. Table 1 provides
more detail on the distribution of state general fund balances as a
share of expenditures in each fiscal year since 1988. At the end of
fiscal year 1989, only five states had general fund balances below 1
percent of expenditures. At the end of fiscal year 1991, 21 states were
in this position. The number of states with general fund balances of
more than 5 percent fell from 30 in fiscal year 1988 to 13 in fiscal
year 1992. The most recent data in the table show some improvement
in state fiscal conditions in fiscal year 1993.

Figure 2 displays the geographical pattern of state fiscal conditions
in fiscal year 1992. The states on the two coasts, where the economic
downturn of the early 1990s was most severe, were most likely to face
fiscal stress. This contrasts with the mid-1980s; when states in the
Midwest and oil-producing Southwest faced an economic downturn
but the coastal states were in better economic and fiscal health. Cross-
state heterogeneity in fiscal condition provides an important basis for
the empirical analysis below.

TABLE 1

State Fiscal Balances (Percentage of Expenditures), Fiscal Years 1988–93

	1988	1989	1990	1991	1992	1993
<1%	5	5	9	21	16	7
1–2.9%	9	7	11	7	10	14
3–4.9%	6	9	7	5	11	10
>5%	30	29	23	17	13	19

Source.—National Association of State Budget Officers, *Fiscal Survey of the States*, September 1990, October 1991, October 1992, and October 1993.
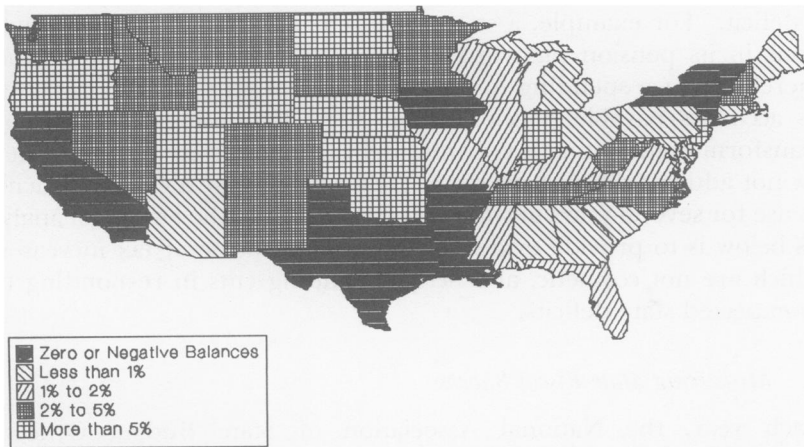
Fig. 2.—1992 ending balance as a percentage of expenditures. Source: NASBO, *Fiscal Survey of the States* (1992).

II. The Dynamics of State Deficit Adjustment

Most state constitutions prevent state governments from running deficits. Antideficit provisions may place limitations on projected, or actual, deficits. In all but five states, the governor must submit a balanced budget. Thirty-nine states have constitutional or statutory provisions requiring the legislature to pass a balanced budget. After the budget has passed, however, revenues and expenditures may diverge from expectations and lead to an *unexpected* deficit. States vary in the speed with which such deficits must be eradicated. Nine states allow actual deficits to be carried forward to the next fiscal year, whereas only six do not require the deficit to be eliminated in the following fiscal year.

States also vary in the policies that are available to eliminate a deficit

and satisfy balanced-budget rules. In most states with no-deficit rules, some types of borrowing can be used to close a current budget gap. Some states require such borrowing to be repaid in the next fiscal year and prevent the use of long-term debt to cover deficits. Other states have constitutional limits requiring a referendum on new issues of long-term debt. These limits make it relatively more costly to use debt to cover unexpected deficits.[4] States can also draw down their general fund balances to cover budget deficits.

In the short run, states may also employ cosmetic accounting changes to satisfy balanced-budget rules. Gold (1983, p. 6) explains that "a state . . . usually has considerable latitude to accelerate tax collections, defer outlays, and adopt accounting practices which avert a deficit." For example, a state might change the actuarial assumptions in its pension plan to reduce the required contribution and thereby reduce spending in the current fiscal year, or it might alter its accounts payable policies. While such accounting changes may transform deficits in one year into deficits in a subsequent year, they do not address the underlying fiscal problem, and they are difficult to use for several years in succession. One goal of the empirical analysis below is to provide evidence on the importance of tax increases, which are not cosmetic, and actual spending cuts in responding to unexpected state deficits.

A. Measuring State Fiscal Shocks

Each year, the National Association of State Budget Officers (NASBO) surveys its members and obtains information on actual revenues and expenditures in the last fiscal year, current fiscal year revenues and expenditures as projected at the beginning of the fiscal year, and any budget cuts or tax changes that have been enacted in the current fiscal year. Virtually all states respond to these surveys. Information on budget cuts is available since the mid-1980s, but data on tax increases have been collected only since 1988. The survey responses can be used to construct measures of state fiscal shocks and to study associated expenditure cuts and tax changes. This study will focus on the period in which both types of data are available, fiscal years 1988–92.

Fiscal shocks are measured as follows. The unexpected component of revenues should equal the difference between the revenues that would have been collected during the fiscal year, given actual economic conditions and other factors, with the tax system that was in effect at *the beginning of the fiscal year,* and the revenues that this tax

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[4] Marlow and Joulfaian (1989), Bunch (1991), and Kiewiet and Szakaly (1992) analyze how borrowing limitations affect state borrowing.

system was forecast to collect at the beginning of the fiscal year. If the tax system was modified during the fiscal year, then the difference between actual revenues and the beginning of fiscal year revenue forecast will *not* measure the unexpected revenue shock. To correct for tax changes within the fiscal year, the revenue shock for state i in year t is defined as

$$\text{REVSHOCK}_{it} = \text{actual revenues}_{it} - \Delta\text{TAX}_{it}$$
$$- \text{forecast revenues}_{it}, \tag{1}$$

where ΔTAX_{it} is the change in revenue during fiscal year t that results from tax changes enacted during that fiscal year.[5]

The failure of the difference between actual revenues and forecast revenues to measure the true revenue shock can be illustrated with an example. Assume that legislators learn during fiscal year t that, given the tax code in force at the beginning of the fiscal year, revenues will differ from the beginning of the fiscal year forecast (F_t) by an amount $S_t < 0$. The legislators consequently enact a surtax that raises just enough additional taxes (ΔTAX_t) to ensure that actual revenues for the fiscal year, R_t, equal the beginning of fiscal year revenue forecast. This requires $\Delta\text{TAX}_t = -S_t$. Defining the revenue shock as actual minus forecast revenues, $R_t - F_t$, would incorrectly show a revenue shock of zero. The measure of the revenue shock defined in (1), however, yields $\text{REVSHOCK}_t = -\Delta\text{TAX}_t = S_t$. It therefore recovers the true revenue shock.

In parallel with the earlier definition of revenue shocks, expenditure shocks are defined by

$$\text{EXPSHOCK}_{it} = \text{actual outlays}_{it} - \Delta\text{SPEND}_{it}$$
$$- \text{forecast outlays}_{it}, \tag{2}$$

where ΔSPEND_{it} measures any spending cuts enacted after the initial budget but during fiscal year t. If increased expenditure needs within a fiscal year raise the outlays associated with the beginning of fiscal year configuration of government programs, but the state enacts program cuts so that total outlays for the fiscal year are precisely equal to projected outlays, ΔSPEND_{it} will be negative. Even if actual and forecast outlays coincide in this case, EXPSHOCK_{it} will be positive.

Combining the revenue and expenditure shocks yields the unexpected deficit shock for a given fiscal year:

$$\text{DEFSHOCK}_{it} = \text{EXPSHOCK}_{it} - \text{REVSHOCK}_{it}. \tag{3}$$

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[5] The variable ΔTAX_{it} does not include the effect of previously enacted tax changes that take effect during fiscal year t. The effect of these anticipated legislative changes is included in the revenue forecast made at the beginning of the fiscal year.

The null hypothesis of equal and opposite-signed reactions to revenue and expenditure shocks was never rejected in the empirical analysis reported below, so the presentation focuses on the links between DEFSHOCK, rather than EXPSHOCK and REVSHOCK separately, and tax increases and expenditure cuts.[6]

States can respond to fiscal shocks by cutting spending or raising taxes. Fisher (1988) claims that most budget changes within a fiscal year are achieved through spending changes rather than new taxes. Some states enact legislation that raises taxes in the same fiscal year; this corresponds to ΔTAX in (1). While NASBO collects information on within-year spending changes, it does not collect comparable information on tax revisions. It does ask about the change in *next fiscal year's* taxes (ΔTAXNEXT) that is attributable to tax legislation enacted during this fiscal year. The survey also reports the date on which the new tax legislation takes effect. The variable ΔTAX is measured as the product of ΔTAXNEXT and the fraction of the current fiscal year remaining after the tax bill's effective date.[7]

In principle, the NASBO data on ΔTAX and ΔSPEND exclude cosmetic accounting changes. The variable ΔTAX corresponds to changes in tax rates or tax bases, and ΔSPEND reflects actual program changes. The empirical results below suggest that ΔTAX and ΔSPEND typically suggest less than complete adjustment to unanticipated deficits. Cosmetic accounting changes and short-term borrowing may account for the remaining adjustment.

Table 2 summarizes the fiscal surprises that states have faced during fiscal years 1988–92. All state fiscal variables are measured in 1988 dollars per capita. In fiscal year 1991, three-quarters of the states faced positive deficit shocks, meaning that deficits were larger than expected. Only two years earlier, this fraction was only slightly over one-third. The table also shows that the source of state fiscal stress has varied during the 1988–92 period. While expenditure overruns occurred throughout the period, states experienced both expenditure overruns and revenue shortfalls in the early 1990s. The mean EXPSHOCK was larger in fiscal years 1988 and 1989 than in the early 1990s, but the average deficit shock was larger in the later years. This is the result of a dramatic increase in unexpected revenue short-

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[6] Some but not all states forecast revenues equal to expenditures. The forecast deficit may not be zero if a state projects adding to, or subtracting from, the state general fund.

[7] This procedure may overstate the change in tax revenue in the current fiscal year, since some provisions may not take effect until the next fiscal year. Even considering the extreme case in which *no* tax changes take effect in the current fiscal year, however, and setting ΔTAX = 0 in defining REVSHOCK do not substantially change the empirical results reported below.

TABLE 2

SUMMARY STATISTICS ON STATE REVENUE AND EXPENDITURE SHOCKS,
FISCAL YEARS 1988–92

	FY1988	FY1989	FY1990	FY1991	FY1992
	1. Deficit Shock				
Mean	−7.3	−14.7	3.0	31.7	15.5
Standard deviation	46.4	59.4	38.6	53.9	35.1
Maximum	176.3	192.5	199.2	164.7	107.0
Minimum	−95.6	−258.8	−89.1	−91.7	−85.7
Positive/negative	16/28	16/31	21/23	36/10	35/11
	2. Expenditure Shock				
Mean	33.2	30.7	1.8	9.0	14.1
Standard deviation	71.1	61.8	57.1	41.9	41.8
Maximum	335.2	207.6	145.5	130.3	229.6
Minimum	−106.6	−199.3	−189.7	−153.0	−60.5
Positive/negative	34/11	37/9	26/21	35/12	36/9
	3. Revenue Shock				
Mean	40.5	45.4	−1.2	−22.7	−1.5
Standard deviation	65.6	68.4	56.1	58.9	50.1
Maximum	204.2	260.4	156.1	123.1	214.6
Minimum	−113.4	−180.3	−185.9	−171.7	−116.6
Positive/negative	34/11	39/8	28/19	17/30	19/27
	4. Outlay Revision				
Mean	−3.1	−2.6	−9.5	−24.4	−15.4
Standard deviation	10.2	7.2	21.5	33.4	17.5
Maximum	.0	.0	.0	.0	.0
Minimum	−49.9	−31.3	−128.2	−128.7	−68.4
Negative	10	11	19	29	34
	5. Within-Fiscal-Year Tax Increase (ΔTAX)				
Mean	−.6	3.3	4.7	5.7	3.0
Standard deviation	4.1	12.9	11.8	11.1	8.0
Maximum	5.8	55.7	57.1	43.3	41.7
Minimum	−20.1	−19.7	−.8	−.7	−1.0
Positive/negative	7/12	18/4	18/2	20/3	11/3
	6. Next-Fiscal-Year Tax Increase (ΔTAXNEXT)				
Mean	1.8	21.2	27.1	34.4	14.5
Standard deviation	13.9	48.0	51.8	51.3	33.9
Maximum	43.3	233.8	266.8	220.1	121.5
Minimum	−40.2	−40.3	−10.4	−3.4	−60.5
Positive/negative	14/11	29/7	26/6	30/4	27/2

SOURCE.—National Association of State Budget Officers, *Fiscal Survey of the States*, various issues. The data are measured in 1988 dollars per capita and apply to all continental states with the exception of Alabama (1988), Louisiana (1988), California (1990), Connecticut (1991), and Massachusetts (all years, expenditure and revenue shocks).

falls. In both fiscal years 1988 and 1989, the revenue surprises for most states were favorable. By fiscal years 1991 and 1992, however, revenue shocks were negative on average, and the number of states with shortfalls exceeded the number with unexpected favorable shocks.

Table 2 also provides descriptive information on the way states have adjusted to fiscal shocks. In fiscal year 1992, for example, more than three-fifths of the states cut their budgets after they were enacted. Panels 5 and 6 of the table show that many more states enacted tax increases to take effect in the next fiscal year than changed their tax laws in the current fiscal year. The table also shows that while the average within-year tax change was negative in fiscal year 1988, corresponding to a tax cut, in subsequent years states on average raised taxes after enacting their budgets.[8]

The data in table 2 illustrate the substantial heterogeneity in the fiscal experiences of different states. In fiscal year 1992, for example, expenditure shocks ranged from a shortfall of $230 per capita (Rhode Island) to an unexpected windfall of $60 per capita (Minnesota). Similar disparities are clear with respect to revenue shocks. The lower panels of the table show that even during fiscal years 1991 and 1992, when most states were experiencing fiscal trouble, some states experienced favorable fiscal surprises and cut taxes.

State fiscal troubles during 1988–92 were the result of many forces, some of which, such as an unexpectedly weak state economy, could affect both revenues and expenditures. The degree to which revenue and expenditure shocks reflect different underlying forces can be measured by computing the correlation between REVSHOCK and EXPSHOCK. For the fiscal years 1988–92, the correlation for the 48 continental states was .68.[9]

B.   State Adjustment to Fiscal Surprises

To analyze how expenditure and revenue shocks affect state spending and taxes, I estimate regression equations of the form

$$\Delta SPEND_{it} = \alpha_0 + \alpha_1 \times DEFSHOCK_{it} + \epsilon_{it} \qquad (4a)$$

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[8] Panels 5 and 6 of table 2 show that the average value of $\Delta TAXNEXT$ is roughly six times the average value of ΔTAX. If effective tax dates are uniformly distributed throughout the fiscal year, this implies that roughly one-third of tax changes take effect in the current fiscal year.

[9] Identifying the common factors that cause revenue and expenditure shocks is difficult. A regression of the unexpected component of expenditures (revenues) on the change in the state unemployment rate between the current and last fiscal year has an adjusted R^2 of .014 (.168). This suggests that shocks to state macroeconomic conditions are not the only source of fiscal shocks.

and

$$\Delta\text{TAX}_{it} = \beta_0 + \beta_1 \times \text{DEFSHOCK}_{it} + \nu_{it}. \qquad (4b)$$

Positive values of DEFSHOCK_{it} correspond to deficits that are larger than expected, and negative values indicate favorable fiscal shocks.[10] Estimates of equations (4a) and (4b) can provide insight into two issues. First, how flexible are state budgeting rules? Do deficit shocks force dollar-for-dollar changes in the level of taxes and spending? The hypothesis that states must balance their budgets on an annual basis corresponds to $\alpha_1 - \beta_1 = -1$. Second, the coefficients in the two equations provide information on the relative use of tax increases and spending cuts in reducing state deficits.[11]

Table 3 reports estimates of equations (4a) and (4b) for the subset of 27 states with annual budget cycles. These states pass budgets for a single year and have legislative sessions to approve budgets each year. The other states have 2-year budget cycles; some of them conduct budget deliberations only every other year, whereas others have some budgetary review in each year. The "natural experiment" provided by fiscal shocks seems to apply most clearly to states with annual budgets, so the remainder of my analysis focuses on this group. Summary statistics analogous to those in table 2 for annual-budget states are reported in Appendix table A1.

Equations (4a) and (4b) suffer from an apparent simultaneity problem, since ΔSPEND_{it} and ΔTAX_{it}, the dependent variables, are included in the definition of DEFSHOCK_{it}, the explanatory variable. This problem is apparent rather than real. *Failure* to subtract these variables in defining REVSHOCK_{it}, EXPSHOCK_{it}, and DEF-SHOCK_{it} would induce a simultaneity problem, whereas subtracting them solves it. To illustrate this, recall that $\text{REVSHOCK}_{it} = R_{it} - F_{it} - \Delta\text{TAX}_{it}$, where R_{it} denotes actual revenues and F_{it} forecast revenues. The earlier discussion showed that $R_{it} - F_{it} = S_{it} + \Delta\text{TAX}_{it}$. If ΔTAX_{it} were *not* subtracted in computing REVSHOCK_{it}, then regressing ΔTAX_{it} on the resulting measure of DEFSHOCK_{it} would amount to regressing ΔTAX_{it} on the sum of itself and another random variable. Subtracting ΔTAX_{it} in computing REVSHOCK_{it}, how-

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[10] Because NASBO collects data only on within-fiscal-year budget increases, ΔSPEND is left-censored, and estimates of α_1 are probably biased toward zero. Rueben (1993) estimates (4a) using several different methods to correct for this problem and obtains results similar to those reported below.

[11] A substantial related literature explores the timing of tax increases. Examples of such work include Bloom and Ladd (1982) on local government decisions to increase property taxes and Berry and Berry (1992) on the political factors that are associated with state tax increases.

TABLE 3

FISCAL RESPONSES TO DEFICIT SHOCKS, FISCAL YEARS 1988–92

Dependent Variable	Constant	Unexpected Deficit	Deficit if > 0	Deficit if < 0	Adjusted R^2
Outlay revision	−9.53	−.22	...	...	.303
	(1.30)	(.07)			
Outlay revision	−3.23	...	−.41	−.03	.432
	(1.68)		(.11)	(.03)	
Outlay revision (IV)	1.99	...	−.61	.06	...
	(3.14)		(.13)	(.05)	
Tax increase within FY	2.27	.09	...	...	.177
	(.69)	(.03)			
Tax increase within FY	−.06	...	.15	.01	.240
	(.69)		(.04)	(.02)	
Tax increase within FY (IV)	−1.84	...	.23	−.01	...
	(2.14)		(.10)	(.03)	
Tax increase next FY	17.74	.45	...	...	.205
	(3.28)	(.12)			
Tax increase next FY	7.56	...	.75	.13	.252
	(3.26)		(.21)	(.05)	
Tax increase next FY (IV)	2.04	...	1.01	.11	...
	(9.04)		(.39)	(.13)	

NOTE.—Data on outlay revisions, tax increases, and the fiscal shocks are drawn from the National Association of State Budget Officers, *Fiscal Survey of the States*, various years. Heteroscedastic-consistent standard errors are shown in parentheses. Data on state financial flows are measured in 1988 dollars per capita. The sample consists of 131 observations from 27 continental states over a period of five fiscal years, with four state-years of missing data as noted in table 2.

ever, avoids this problem. A similar argument applies to the subtraction of $\Delta SPEND_{it}$ in the definition of $EXPSHOCK_{it}$.[12]

The first and fourth rows in table 3 show the outlay revision and tax increase equations for annual-budget states. These equations impose the same adjustment dynamics on positive and negative values of $DEFSHOCK_{it}$. The estimates suggest that a \$100 per capita unexpected deficit induces an outlay reduction of \$22 and a tax increase of \$9 in the current fiscal year. The seventh row shows that the tax change in the next fiscal year is \$45 per \$100 unexpected deficit. The net adjustment to a deficit shock, computed by adding the current fiscal year's spending change to the next fiscal year's tax increase, is $\alpha_1 - \beta_1 = -.67$ (.19).[13]

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[12] To explore the sensitivity of the results to subtracting ΔTAX_{it} and $\Delta SPEND_{it}$ in defining $REVSHOCK_{it}$ and $EXPSHOCK_{it}$, respectively, I estimated (4a) and (4b) using an alternative explanatory variable, $DEFSHOCK''_{it}$, defined as $DEFSHOCK_{it} - \Delta TAX_{it} + \Delta SPEND_{it}$. The resulting estimates of α_1 and β_1 were very similar to those reported in table 3, reflecting the fact that ΔTAX_{it} and $\Delta SPEND_{it}$ account for a relatively small share of the variance of $DEFSHOCK_{it}$.

[13] I explored the robustness of these results by including both time and state effects in the equations and found very little change in the estimated coefficients. I also

Table 3 also presents estimates of (4a) and (4b) allowing separate adjustment coefficients on positive and negative deficit shocks. This distinction is important. A $100 unexpected deficit leads to a $41 reduction in outlays, whereas an unexpected surplus of the same magnitude leads to only a $3 spending increase. For taxes, the analogous results suggest that a $100 unexpected deficit leads to a $15 within-fiscal-year tax increase and a $75 tax increase next fiscal year, whereas a $100 unexpected surplus leads to virtually no change in current fiscal year taxes and a $13 cut in the next fiscal year. The pattern of strong reactions to unexpected deficits and virtually no adjustment to unexpected surpluses persists throughout the analysis. These results bear on the long-standing debate on how federal grants affect state and local spending. At least in the short run, they suggest that unexpected lump-sum increases in federal grants may be channeled to state general funds rather than to increased outlays.

One potential problem in estimating the tax and spending adjustment equations is that the deficit shock variable may be endogenous. If forecasts of revenues and expenditures are affected by political pressures and state economic prospects, the results in table 3 may simply reflect the correlation between tax and spending changes and these biases. The limited prior evidence on the rationality of revenue and spending projections, such as Feenberg et al. (1989), suggests some inefficiency in the way revenue forecasts incorporate historical information on the state economy and related variables. There is little evidence, however, of any systematic biases in state revenue projections, which suggests that the potential endogeneity problem is not serious.

One way to correct for the potential endogeneity of the deficit shock variable is to construct an econometric forecast of state revenue and expenditure and to use this forecast variable in place of the reported NASBO forecast. I estimated time-series models for state spending and revenues; used lagged spending, lagged expenditures, and lagged state personal income as explanatory variables; and labeled the differences between actual outcomes and the forecasts from these models REVSHOCK' and EXPSHOCK', respectively. This yielded an alternative estimate of the fiscal shock, DEFSHOCK', which I used as an instrumental variable for DEFSHOCK in equations (4a) and (4b).

The results of this instrumental variable estimation are also shown in the third, sixth, and ninth rows of table 3. They suggest that spuri-

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estimated a weighted least squares regression, assigning weights to states based on population, and tried estimating eqq. (4a) and (4b) for the set of states with biannual budget cycles. In both cases, the results were again very similar to those in table 3.

ous endogeneity cannot account for the results described above. The estimated adjustment parameters, α_1 and β_1, are both larger in absolute value when (4a) and (4b) are estimated by instrumental variables. The estimates suggest that each dollar of unexpected deficit leads to a \$0.61 spending cut and a \$0.23 tax increase within the fiscal year and a tax increase of \$1.01 in the next fiscal year. These point estimates imply that the total deficit reduction is larger than the deficit shock, although the standard errors are large. The hypothesis that $\alpha_1 - \beta_1 = -1$ cannot be rejected at standard confidence levels.

Both the ordinary least squares and instrumental variables results suggest that states react to unexpected deficits with real changes in fiscal position. Approximately two-thirds of a shortfall is made up by expenditure changes within the fiscal year and tax changes in the current and next fiscal years. Tax increases within the fiscal year make a relatively small contribution to deficit reduction, but tax changes that take effect the next fiscal year are more important than spending cuts in closing unexpected deficits.

III. Fiscal Institutions and State Deficit Correction

The previous section reported average state responses to unexpected deficits. Since there are important institutional differences across states, this section tests for the presence of identifiable differences in short-run state fiscal dynamics that are related to fiscal institutions. Studying responses to fiscal shocks is a novel method for assessing the effect of fiscal institutions on tax and expenditure levels. Most previous work on this question has estimated reduced-form models for state and local spending, in the tradition of Borcherding and Deacon (1972) or Bergstrom and Goodman (1973). Such equations relate per capita spending to per capita income, the after-federal-tax price of state expenditures, various measures of state voter attributes, and indicator variables for the presence of particular fiscal institutions.[14] The estimated coefficients on these indicator variables are then interpreted as estimates of the effects of these institutions on spending levels.

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[14] Studies in this tradition include Abrams and Dougan (1986), the Advisory Commission on Intergovernmental Relations (1987), Crain and Miller (1990), von Hagen (1991), and Eichengreen (1992) on tax and expenditure limitations; Holtz-Eakin (1988), Carter and Schap (1990), and Alm and Evers (1991) on line item vetoes; and Poterba (in press) on capital budgets. Elder (1992) studies the effect of tax and expenditure limitations on state spending growth. Rogers and Rogers (1993) study similar issues in a panel data set, although they also consider the effects of fiscal conditions on the adoption of antideficit laws.

The difficulty with this approach is that fiscal institutions are en-dogenous. States with voters who approve a tax or expenditure limit may also be states with voters who demand relatively little public expenditure. The findings from these studies may therefore fail to describe the spending effects of imposing new fiscal institutions on states that have not already chosen to adopt them.

My analysis considers how the *changes* in spending and taxes after a deficit shock differ as a function of state fiscal institutions. Equations (4a) and (4b) are modified to interact indicator variables for various institutions with DEFSHOCK_{it}. To illustrate this approach, consider the effect of state balanced-budget requirements. While all states have some form of balanced-budget requirements, these rules differ sub-stantially across states. The Advisory Commission on Intergovern-mental Relations (1987) catalogs these rules and assigns an overall score between 1 and 10 to the stringency of state balanced-budget provisions.

To study whether antideficit rules have any effect, I divide the 27 continental states with annual budget cycles into two categories on the basis of whether they had scores of 5 and below (four states) or 6 and above (23 states). I define an indicator variable for "weak anti-deficit rules" in state i, WKDEF_i, and then interact this indicator vari-able with the deficit shock variables defined above.[15] This yields esti-mating equations of the form

$$\Delta\text{SPEND}_{it} = \alpha_0 + \alpha_1 \times \text{DEFSHOCK}_{it}$$
$$+ \alpha_2 \times \text{WKDEF}_i \times \text{DEFSHOCK}_{it} + \epsilon_{it} \tag{5a}$$

and

$$\Delta\text{TAX}_{it} = \beta_0 + \beta_1 \times \text{DEFSHOCK}_{it}$$
$$+ \beta_2 \times \text{WKDEF}_i \times \text{DEFSHOCK}_{it} + \nu_{it}. \tag{5b}$$

I continue to allow different coefficients on positive and negative deficit shocks.[16]

Estimation results for (5a) and (5b), again focusing on states with annual budget cycles, are shown in columns 1 and 2 of table 4. Col-umn 1 shows estimates with ΔSPEND as the dependent variable, and

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[15] All the antideficit rules for states in this sample were adopted prior to 1988, so there is no within-state variation in these provisions.

[16] I present several sets of regression results interacting individual institutions, such as weak antideficit rules, with DEFSHOCK_{it} rather than a single equation with many interactions simultaneously. This is largely driven by the discrete nature of the institu-tional variables and my small sample size. With only 27 states in the sample, including many such variables simultaneously yields very small effective cell sizes for different institutional permutations.

TABLE 4

ANTIDEFICIT POLICIES AND STATE REACTIONS TO FISCAL SHOCKS

	WEAK ANTIDEFICIT RULES		TAX LIMITATION		LOW EXPECTED GENERAL FUND BALANCE	
	ΔSPEND	ΔTAXNEXT	ΔSPEND	ΔTAXNEXT	ΔSPEND	ΔTAXNEXT
Constant	−3.96 (1.76)	8.51 (3.79)	−3.54 (1.59)	6.49 (3.53)	−3.14 (1.27)	7.86 (3.58)
DEFSHOCK if > 0	−.44 (.11)	.76 (.22)	−.37 (.10)	1.03 (.33)	−.25 (.10)	.66 (.30)
DEFSHOCK if < 0	−.07 (.04)	.20 (.13)	−.05 (.04)	.12 (.13)	−.02 (.02)	.11 (.04)
Weak rules × DEFSHOCK > 0	.27 (.14)	−.14 (.52)	...	...	...	...
Weak rules × DEFSHOCK < 0	.06 (.03)	−.10 (.12)	...	...	...	...
Tax limit × DEFSHOCK > 0	...	...	−.06 (.17)	−.56 (.33)	...	...
Tax limit × DEFSHOCK < 0	...	...	.03 (.03)	−.01 (.12)	...	...
Low balance × DEFSHOCK > 0	...	...	...	...	−.30 (.14)	.16 (.37)
Low balance × DEFSHOCK < 0	...	...	...	...	−.04 (.02)	.11 (.18)
Adjusted R^2	.45	.24	.42	.29	.49	.25

NOTE.—Heteroscedastic-consistent standard errors are shown in parentheses. All equations are estimated on the set of 27 states with annual budget cycles ($N = 131$), as noted in table 3. Data on state financial flows are measured in 1988 dollars per capita.

in column 2, ΔTAXNEXT is the dependent variable. The results suggest that states with weak antideficit rules adjust spending less in response to positive deficit shocks than their counterparts with strict antideficit rules. A \$100 deficit overrun leads to only a \$17 expenditure cut in a state with a weak antideficit law, whereas it leads to a \$44 cut in other states. There is no evidence that antideficit rules affect tax changes. In a state with strong antideficit provisions, budget cuts and tax increases make up more than the full amount of the deficit: $\alpha_1 - \beta_1 = -1.20$. In states with weak antideficit rules, the analogous deficit reduction is only \$79 per \$100 deficit.[17]

The approach developed in equations (5a) and (5b) can also be applied to study the effects of other fiscal institutions on deficit adjustment. Columns 3 and 4 of table 4 show the effect of tax and expenditure limitations on fiscal dynamics. States with tax limitations raise taxes by less in response to an adverse deficit shock than states without such limits. While states without tax and expenditure limits are predicted to raise taxes by \$1.03 in response to each \$1.00 unexpected deficit, the analogous adjustment for states with tax limitations is only \$0.47. There is no evidence that spending cuts are any larger in states with tax and expenditure limits.

Columns 5 and 6 of table 4 study whether a state's response to a deficit shock is affected by its fiscal condition, as measured by its general fund balance. Since general fund balances can be adjusted to offset deficits, one would expect to find more pronounced fiscal adjustments in states with low balances. The indicator variable that is interacted with DEFSHOCK in this case is set equal to one if the end-of-year general fund balance predicted at the beginning of the fiscal year is less than 2 percent of total spending. The results suggest that states with low expected general fund balances make larger spending cuts in response to positive deficit shocks. For a state with a predicted balance of more than 2 percent of spending, spending adjusts by \$0.25 per dollar of deficit. For states with lower predicted balances, the corresponding spending cut is \$0.55 per deficit dollar. There is also weak evidence that tax increases as a fraction of the deficit are larger in states with low expected balances.

The findings in this section suggest that fiscal institutions affect the short-run patterns of taxes and expenditures when states experience unexpected fiscal shocks.[18] Whether these results bear on the larger

[17] These results are consistent with Alt and Lowry's (1994) findings using *Census of Governments* data for an earlier period. While there are minor differences in the identification of weak antideficit states between their study and the current paper, they do not affect the results.

[18] Regressing DEFSHOCK on indicator variables for various fiscal institutions to determine whether the presence of some institutions systematically affects expenditure or revenue forecasts reveals no statistically significant relationships.

question of how fiscal institutions affect the level of government spending, which is the integral of all prior changes, remains an open question. The relatively short time span of the current data set does not permit any inferences about the longer-run fiscal effects of these institutions.

IV. Divided Government, Politics, and Deficit Correction

Whether political factors are important determinants of economic policy is a long-standing subject of debate in political economy. One issue in this debate, analyzed for example in Alesina and Rosenthal (1994), is whether divided governments function differently, and select different policies, than governments with a single party in power. Roubini and Sachs (1989) find that nations with a divided government have higher budget deficits, and McCubbins (1991) tries to explain the pattern of U.S. budget deficits by appealing to the role of divided government. The wide array of state variation in political control provides a natural opportunity to obtain further evidence on the importance of party differences. Alt and Lowry (1994) find that states with governors from a party different from that of the legislature are more likely than single-party states to run budget deficits.

Columns 1 and 2 of table 5 show the results of interacting a variable for a governor and lower house in the legislature from the same party with DEFSHOCK, as in the previous analysis of fiscal institutions.[19] The estimates suggest that single-party states raise taxes, and cut spending, by greater amounts in response to deficit shocks. I disaggregated one-party states into those controlled by Democrats (14 states) and those controlled by Republicans (five states) and could not reject the null hypothesis of no difference in fiscal adjustment patterns across parties.

Columns 3 and 4 of table 5 show that there is an interaction between weak antideficit rules and the impact of divided government. In states with weak antideficit rules, the estimates suggest that divided government does not affect the amount of outlay reduction in response to a positive deficit shock. In states with strict antideficit rules, however, the presence of single-party control has an important effect on deficit adjustment.

The relationship between divided government and fiscal adjustment can be interpreted in several ways. It may reflect the lower costs

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[19] This variable is set equal to zero if the governor or legislature is an independent and also for Nebraska, which has a single chamber of 49 members, all elected without party affiliation.

TABLE 5
POLITICAL FACTORS AND STATE REACTIONS TO FISCAL SHOCKS

	UNIFIED GOVERNMENT		WEAK RULES AND UNIFIED GOVERNMENT		GUBERNATORIAL ELECTION YEAR	
	ΔSPEND	ΔTAXNEXT	ΔSPEND	ΔTAXNEXT	ΔSPEND	ΔTAXNEXT
Constant	−3.49 (1.36)	7.09 (3.76)	−4.22 (1.34)	8.29 (4.05)	−3.63 (1.61)	9.57 (3.37)
DEFSHOCK if > 0	−.23 (.12)	.42 (.22)	−.23 (.12)	.41 (.22)	−.43 (.11)	.78 (.22)
DEFSHOCK if < 0	−.07 (.03)	−.02 (.11)	−.09 (.03)	.01 (.12)	−.03 (.03)	.13 (.05)
Same party × DEFSHOCK > 0	−.28 (.14)	.54 (.35)	−.33 (.14)	.55 (.37)	...	...
Same party × DEFSHOCK < 0	.05 (.02)	.18 (.10)	.02 (.02)	.28 (.15)	...	...
Same party and weak rules × DEFSHOCK > 0	...	...	.37 (.15)	−.09 (.70)	...	...
Same party and weak rules × DEFSHOCK < 0	...	...	.05 (.03)	−.17 (.14)	...	...
Gubernatorial election × DEFSHOCK > 0	...	...	...	...	.27 (.15)	−.52 (.32)
Gubernatorial election × DEFSHOCK < 0	...	...	...	...	.03 (.09)	.54 (.18)
Adjusted R^2	.47	.28	.51	.27	.44	.26

NOTE.—Heteroscedastic-consistent standard errors are shown in parentheses. All equations are estimated on the set of 27 states with annual budget cycles ($N = 131$), as noted in table 3. Data on state financial flows are measured in 1988 dollars per capita.

of reaching political consensus in single-party states. Alternatively, divided-party states may be states in which both the governor and the state legislature are more politically vulnerable than in other states, and consequently, these elected officials may be reluctant to take unpopular actions, such as raising taxes or cutting spending.

The equations reported in columns 5 and 6 of table 5 explore whether the position in the electoral cycle affects the magnitude of tax increases and spending cuts. Position in the cycle is measured with an indicator variable equal to unity in fiscal years immediately prior to gubernatorial elections. The results suggest that spending cuts and tax increases are smaller when governors are about to stand for election. These results, which are statistically significant at the .10 but not the .05 confidence level, provide further evidence of the importance of political considerations in determining fiscal adjustment. Besley and Case (1993) present related evidence that state taxes increase at the end of the terms of "lame-duck" governors.

V. Conclusion

The results in this paper suggest that fiscal institutions and political factors matter for short-run deficit dynamics. States with relatively tight constitutional or statutory rules that make it more difficult to run deficits experience more rapid fiscal adjustment when revenues fall short of expectations or spending exceeds projections. Political factors also matter: states in which one party controls both the governorship and the lower house in the legislature are more likely to respond quickly to unexpected deficits than their divided-government counterparts are.

One of the important issues that this paper does not consider is whether state reactions to fiscal shocks depend on the source and expected persistence of these shocks. Responses to transitory revenue shortfalls might be smaller than the responses to permanent shocks, provided that the state general fund balance allows some smoothing over time. Although the NASBO data used in this study span too few years to permit decomposing deficit shocks into transitory and permanent components, in principle such an analysis could be carried out using data from other sources. A related issue, which could also be analyzed in a longer data panel, is the relationship between short-term fiscal dynamics and long-term tax and expenditure levels.

This paper's emphasis on unexpected fiscal shocks in the late 1980s and early 1990s as "natural experiments" for studying fiscal policy could be extended by searching for other fiscal shocks. For example, Ladd (1993) explores state responses to the unexpected fiscal dividend that many states received from the federal Tax Reform Act of

1986 (TRA86). Since the act expanded the definition of federal taxable income, more than half of the states received revenue windfalls. California and New York were estimated to collect more than a billion dollars in additional revenue as a result of these changes. Another such fiscal shock might be the enactment of federal mandates during the mid-1980s for state spending on Medicaid expansions. Studying the effect of such shocks on state fiscal behavior can provide new evidence on the economic effects of fiscal institutions.

Appendix

TABLE A1

SUMMARY STATISTICS ON STATE REVENUE AND EXPENDITURE SHOCKS, FISCAL YEARS 1988–92

	FY1988	FY1989	FY1990	FY1991	FY1992
			1. Deficit Shock		
Mean	−9.6	−20.3	10.2	36.7	19.6
Standard deviation	41.0	60.5	31.6	44.3	35.1
Maximum	85.1	73.7	99.2	164.7	107.0
Minimum	−95.6	−258.8	−36.5	−42.9	−54.4
Positive/negative	8/17	8/19	13/12	20/6	21/6
			2. Expenditure Shock		
Mean	29.4	24.1	6.8	6.9	21.2
Standard deviation	52.6	35.9	45.2	41.8	45.9
Maximum	189.4	111.4	85.0	73.7	229.6
Minimum	−106.6	−65.3	−168.5	−153.0	−18.3
Positive/negative	21/4	24/3	15/12	20/7	23/4
			3. Revenue Shock		
Mean	39.0	44.4	−3.4	−29.8	1.6
Standard deviation	62.1	64.3	42.9	57.4	54.3
Maximum	204.2	260.4	57.1	58.1	214.6
Minimum	−113.4	−40.3	−165.0	−171.7	−116.6
Positive/negative	23/2	24/3	17/10	9/18	11/16
			4. Outlay Revision		
Mean	−1.5	−3.3	−7.0	−25.1	−18.6
Standard deviation	5.5	7.4	12.2	29.1	19.7
Maximum	.0	.0	.0	.0	.0
Minimum	−27.1	−26.5	−47.7	−124.9	−68.4
Negative	4	9	11	17	20
		5. Within-Fiscal-Year Tax Increase (ΔTAX)			
Mean	−.5	4.8	2.0	5.2	2.8
Standard deviation	5.0	14.6	5.5	11.6	6.1
Maximum	5.8	55.7	21.4	43.3	26.6
Minimum	−20.1	−14.0	.0	−.7	−1.0
Positive/negative	4/7	9/2	8/0	12/3	6/1

TABLE A1 (Continued)

	FY1988	FY1989	FY1990	FY1991	FY1992
	6. Next-Fiscal-Year Tax Increase (ΔTAXNEXT)				
Mean	4.4	25.6	26.2	29.4	19.0
Standard deviation	17.9	56.5	56.6	54.4	36.1
Maximum	43.3	233.8	266.8	220.1	119.0
Minimum	−40.2	−23.6	−10.4	−3.4	−60.5
Positive/negative	7/6	16/3	16/1	16/4	18/2

SOURCE.—See table 2. All calculations correspond to the 27 continental states with annual budget cycles.

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