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State and Local Budgets the Day after It Rained: Why Is the Surplus So High?

READERS of the financial press will be shocked to find that, in the aggregate, the 78,000 state and local governments in this country are running a hefty budget surplus. These governments had a combined budget surplus of $29.2 billion in 1977, by far the largest ever recorded, and in part offsetting the impact of the one government most noticeably not in surplus (the federal deficit was $49.6 billion in that year). The rise in the state and local surplus has been exceedingly dramatic: at its recession low in the first quarter of 1975 it was $3.7 billion; by the third quarter of 1977 it had risen to $32.9 billion, accounting for over one-third of the national rise in gross saving over this two-year period.

Such large changes in the saving behavior of any sector are interesting in their own right, and they have important macroeconomic implications for short-run stabilization policies and long-run growth. In this report I examine both matters. I first disaggregate the budgetary numbers to explore separately movements in the surplus of state and local pension funds and general governments on both current and capital accounts. I then estimate some time-series equations explaining state and local budgetary magnitudes up to 1974, making out-of-sample extrapolations of these

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equations to see how well recent budget movements can be explained. These extrapolations are used to search out any recent shift in state and local spending and taxing behavior—possibly related to the severe 1975 recession which might have drawn down financial assets to dangerously low levels, possibly to federal policies adopted at that time. Then I examine the behavior of state and local budgets over the 1975 recession and calculate the likely impact of various components of the recently enacted economic-stimulus package.

Recent Movements in the State and Local Surplus

The first matter is the relatively straightforward identification of the source of the recent growth in the surplus. This information is given in table 1. The first column shows the total surplus and the next two divide it into two components, the saving (as measured in the national income accounts) of employees' pension funds (column 2) and that of state and local general governments (column 3). The surplus is larger for the pension funds, but the more dramatic changes, and departures from past experience, are for general governments.

The next three columns show how the surplus of general governments might be split into its current and capital components. The surplus given in the national accounts treats all state and local construction expenditures as outlays, but does not consider retirement of long-term debt (which might be viewed as a proxy for capital consumption) as an outlay. To derive the current operating surplus for state and local governments, the number that cannot be negative for a government under most legal or constitutional restrictions, I have deducted net construction expenditures from total outlays (that is, added column 4 to the general government surplus), and then added debt retirement to outlays (that is, deducted column 5 from the surplus).[1] The resulting numbers in column 6 show that the rise in the surplus has come in roughly equal parts from the current budget (column 6) and the sharp fall in net construction expenditures (column 4).

The proper treatment of employees' pension funds for the present

1. In fact, as the New York City experience has indicated, inventive local officials do not always find it difficult to get around this restriction. They can sometimes borrow short term "in anticipation" of future revenues, or they can hide some current expenditures in the capital account and finance them with long-term debt.

Table 1. Budget Surplus of State and Local Governments, by Component, Quarterly, 1974–77[a]
Billions of current dollars, seasonally adjusted annual rate

			General governments			
Year and quarter	*Total surplus* (*1*)	*Social insurance funds* (*2*)	*Total* (*3*)	*Net construction expenditures*[b] (*4*)	*Retirement of long-term debt*[c] (*5*)	*Operating budget* (*6*)
1974:1	9.5	9.8	−0.3	26.2	10.3	15.6
2	8.8	10.3	−1.5	28.0	10.5	16.0
3	7.7	10.7	−3.0	27.6	10.7	13.9
4	4.2	11.1	−6.8	27.2	10.9	9.5
1975:1	3.7	11.3	−7.6	25.7	11.1	7.0
2	4.5	11.8	−7.2	26.6	11.3	8.1
3	6.6	12.3	−5.8	27.4	11.5	10.1
4	8.9	13.1	−4.2	27.0	11.7	11.1
1976:1	13.3	13.7	−0.4	25.7	11.9	13.4
2	12.9	14.4	−1.5	23.9	12.0	10.4
3	21.1	14.8	6.2	21.7	12.1	15.8
4	26.5	15.2	11.3	19.3	12.2	18.4
1977:1	27.3	15.4	11.9	16.9	12.3	16.5
2	25.4	15.5	10.0	20.1	12.4	17.7

Sources: *Survey of Current Business*, vol. 57 (July and November 1977), tables 3.4, 3.7, 3.14; and U.S. Bureau of the Census, *Governmental Finances in 1975–76*, series GF 76 no. 5 (Government Printing Office, 1977), and various preceding issues, table 3. Column 3 equals column 1 minus column 2. Column 6 equals column 3 plus column 4 minus column 5. Figures are rounded.

a. Most of the numbers for 1977 are estimates.

b. Construction expenditures minus an interpolated estimate of grants for capital construction. The numbers are treated as expenditures in the national income accounts, but not in the current operating budgets of most state and local governments.

c. Interpolation of annual numbers for the retirement of long-term debt of state and local governments. This item is viewed as a mandated expenditure in the operating budgets of state and local governments but is not treated as an expenditure in the national income accounts.

analysis is something of a mystery. First of all it is not even clear that the recorded surplus is a surplus. It simply measures the cash-flow status of employees' pension funds: in 1977:2, for example, employees' payroll contributions and interest earnings exceeded benefit payments by $15.5 billion. This large surplus reveals nothing about whether the funds are actuarially sound (indeed, many of them are not). The surplus does not even imply that their actuarial position improved in the quarter (which it probably did not). The surplus is simply a cash-flow concept, necessary to make the national income statements balance but not a good measure of the financial health of the trust funds.

The second puzzle regards the ownership of these pension surpluses. The national income accounts make a distinction between governmental and nongovernmental pension funds. Surpluses of nongovernmental pension funds are considered a form of deferred compensation of the employees and are added into personal income and, net of any impact on private consumption, to personal saving. Surpluses of governmental pensions, the largest of which is social security, are treated as public saving. While this distinction may be appropriate for social security, which is owned by its future beneficiaries in only a very remote sense, it seems much more questionable for state and local pensions, which resemble private pension plans in the degree to which they are "owned" by employees.

On both counts, therefore, the meaning of the component of saving in pension funds is ambiguous. On one hand, this total does not represent saving in the usual net-worth sense, and on the other, it appears in the public sector only through an accounting quirk. Accordingly, for the balance of this discussion I will simply ignore pension funds, focusing only on the budgetary behavior of general governments.[2]

Regression Estimates of State and Local Budgets

The approach used to explain recent changes in state and local budgets is to fit an empirical model to a stable period, say 1954–74, and then see if these coefficients predict actual budget changes in a turbulent period, 1975–77. If the equations predict well, there is no surprise in the recent developments: they have followed historical responses to determinants of state and local budgets. If the equations do not predict well, the question is, how have the historical patterns of response changed?

An empirical model explaining the budgetary behavior of state and local general governments can be developed through orthodox utility-maximization principles. Assume that state and local decisionmakers, whether private or public employees,[3] take all wages and prices as given

2. The flow-of-funds accounts already follow this reasoning and omit surpluses of state and local pension funds from government saving.

3. It clearly does matter which they are, but for now I gloss over that issue and simply deal with one aggregate decisionmaker. For a more careful treatment of this issue, see Paul Courant, Edward M. Gramlich, and Daniel Rubinfeld, "Public Employee Market Power and the Level of Government Spending" (University of Michigan, Institute for Public Policy Studies, 1977; processed).

and maximize an objective function dependent on (a) public current consumption; (b) private consumption; (c) the stock of public capital; (d) the stock of public financial assets. After adjusting each of these arguments for the complex ways in which different types of federal grants enter the picture, the respective first-order conditions can be transformed into state and local demand functions in which spending, taxes, and the surplus depend on lagged stocks of capital and financial assets, income, relative prices, federal grants, and demographic need variables. The way in which this is done is essentially that developed by Galper and myself five years ago,[4] with two new wrinkles.

First, the original analysis distinguished between open- and closed-end categorical matching grants (there called case A and case C grants). Since their impacts on spending were found to be quite similar, in this paper the two types of grants are combined and treated as if they were all closed-end grants. The distinction between categorical aid (C grants) and noncategorical aid (B grants) is maintained, however.

Second, since state and local employment has become an object of interest, an employment component is broken out of current expenditures, with the remainder—"all other"—including purchases of nonconstruction goods and nonemployment services and transfer payments.

The arguments in the state and local utility function (Q_i) are then

$$Q_1 = E_1/W + \gamma_1 \frac{1}{m_1} G_1/W - N \tag{1a}$$

$$Q_2 = E_2/\mathrm{P} + \gamma_2 \frac{1}{m_2} G_2/\mathrm{P} - N \tag{1b}$$

$$Q_3 = E_3/P_k + \gamma_3 \frac{1}{m_3} G_3/P_k + (1 - \delta)K_{-1}/P_k = E_3/P_k + K'/P_k \tag{1c}$$

$$Q_4 = \gamma_4 Y/P - T/P \tag{1d}$$

$$Q_5 = F_{-1}/P + S/P. \tag{1e}$$

The first two arguments, equations 1a and 1b, relate current consumption to discretionary spending on employment (E_1) and all other (E_2), deflated by the state and local wage rate (W) and the GNP deflator (P), respectively. Total spending in these components can be derived by adding

4. Edward M. Gramlich and Harvey Galper, "State and Local Fiscal Behavior and Federal Grant Policy," *BPEA, 1:1973*, pp. 15–58.

the spending generated by federal categorical grants (G_1 and G_2), multiplied by the inverse of the federal matching ratio (m_1 and m_2) to give the spending mandated on receipt of these grants. In utility terms, however, federal grants may not increase state and local welfare at the same rate as discretionary spending, and the "displacement" parameters γ_i are inserted to adjust for this heterogeneity. The closer the γ_i are to one, the more substitutable are grant-mandated and discretionary spending, and the more state and local governments might be expected to respond to federal categorical grants by cutting back their own spending in that area. The final adjustment in these two arguments is for some as yet unspecified vector of demographic needs (N). The higher the needs—as measured by, say, the welfare or school-age population—the less utility is implied by a given amount of expenditures and the more likely is the district to increase expenditures.

Argument 1c deals with the capital stock. Here, utility depends on discretionary and mandated spending on construction, still deflated by the price of capital goods (P_k). Since the stock of capital is not entirely consumed in one period, however, the lagged stock of capital also adds to utility—$K_{-1}(1 - \delta)$, where δ is the quarterly depreciation rate. The higher this lagged stock, the less occasion to add to it through further current construction. To simplify the model, because $K_{-1}(1 - \delta)$ and construction grants are both exogenous and operate through the same utility parameters, they are combined into one K' term (using for γ_3 an average estimate of γ_1 and γ_2 implicit in the first two arguments).

The fourth argument, 1d, involves private spending. In a world of no illusions and perfect voter control of bureaucrats, γ_4 would equal unity and the private-spending argument would be simply real gross national product after federal taxes (Y/P) less real state and local taxes (T/P). On the other hand, in the real world, in which voters are not perfectly able to control politicians and these bureaucrats and politicians in effect have extra votes, the community might behave as if more utility is gained through a cut in taxes (for which politicians can claim credit) than through a rise in income (for which they cannot). Should this be the case, the "income displacement" parameter γ_4 is less than one, and the source of income becomes important in determining the level of community public and private spending. Changes in private income and noncategorical grants will stimulate exactly the same amount of public spending per dollar when $\gamma_4 = 1$, but noncategorical grants, which are already in the public treasury and do not require the painful act of increasing taxes, will stimulate more public spending when $\gamma_4 < 1$.[5]

The final argument, 1e, describes the stock of accumulated financial assets. As this stock, which includes lagged financial assets (F_{-1}) plus the current surplus (S), becomes greater, there will be less incentive to run further surpluses and more incentive to raise expenditures or lower taxes. In the long run the stock of financial assets, not the flow of new saving, is assumed to adjust to a change in grants, income, or prices, and the flow of saving will return to its level before that change.

Utility maximization in effect determines how states and localities allocate scarce budgetary resources to these five competing claims. Governments maximize

$$U = f(Q_i), \text{ for } i = 1, \ldots, 5, \qquad f'(Q_i) > 0,\ f''(Q_i) < 0, \tag{2}$$

subject to the budget constraint that

$$S = X + T - E_1 - E_2 - E_3. \tag{3}$$

Here X is exogenous budgetary resources—untied revenue-sharing aid to the community less predetermined expenditures for debt service and less the amount necessary to match categorical grants $G_i - (G_i/m_i)$.[6] Performing the usual algebraic operations leads to the set of estimating equations used below. However, a number of specific problems had to be dealt with in making the actual estimates.

Definition of N. In previous work Galper and I used one variable (the proportion of families headed by females) to measure the population

5. Another way to think of this phenomenon is to postulate a "flypaper" effect: money sticks where it hits. The obvious explanation is a bureaucratic one, but there could also be an economic rationale, working through the misperception of the true marginal price of public expenditures in the presence of lump-sum grants. See Paul Courant, Edward M. Gramlich, and Daniel Rubinfeld, "The Stimulative Effects of Intergovernmental Grants: Why Money Sticks Where It Hits" (University of Michigan, Institute for Public Policy Studies, 1977; processed).

6. Were the budget-constraint identity written in terms of total expenditures, it would be

$$S = T - E_1 - \frac{1}{m_1}G_1 - E_2 - \frac{1}{m_2}G_2 - E_3 - \frac{1}{m_3}G_3 + X' + G_1 + G_2 + G_3,$$

where X' is lump-sum transfers less debt-service payments. The exogenous-resources term used in the text is then derived as

$$X = X' + \sum_{i=1}^{3}\left(1 - \frac{1}{m_i}\right)G_i.$$

dependent on welfare and one (the proportion of school-age children in the population) to measure needs for public schooling. When estimated up to 1974, the latter variable no longer was statistically significant, presumably because its steady decline was not reflected in a concomitant drop in spending on public schools. Hence it was no longer included. On the other hand, it has been claimed that state and local employment spending is inherently countercyclical, always rising more in a recession in direct violation of the presumed impact of the budget constraint (unless governments have saved a stock of assets for this rainy day).[7] This hypothesis was tested by including the unemployment rate, with constant demographic weights, as an additional needs variable.

Definition of relative prices. The relative price of compensation expenditures is assumed to be simply W/P, where W is the average wage used to deflate compensation expenditures. For construction, there is the additional complication that benefits are received over time, so that the appropriate price is the annual opportunity cost of capital $(R + 4\delta)P_k/P$, where R is the Aaa municipal bond rate. Attempts to use the Baa rate gave approximately the same results; attempts to use the two rates together did not prove very successful, presumably because of multicollinearity.

Scale of the economy. Since all price-deflated real variables would grow naturally with population size, giving all variables a common trend and possibly introducing heteroskedasticity, all dependent variables and all independent variables except the two relative-price terms and the needs variables are deflated by population.

Autocorrelation. Errors in the state-local sector are strongly autocorrelated, possibly because the quarterly data are not very good and a variety of interpolation techniques are used by the Bureau of Economic Analysis to estimate budgetary variables. To deal with this problem, first differences are used in all estimations, and all statistics on equation fit refer to differences.

Lagged responses. Many of the independent variables should operate through lagged responses. Since there are cross-equation restrictions on coefficients, the lags in the individual equations should be related through the budget identity. I have dealt with this problem by making initial estimates of the equations using the Almon interpolation procedure, and then simplifying those lags to lagged independent variables with constant

7. See, for example, Walter Ebanks, "The Stabilizing Effects of Government Employment," *Explorations in Economic Research*, vol. 3 (Fall 1976), pp. 564–83.

weights (to avoid a proliferation of independent variables). All of the independent variables showed weights so heavily pointed toward the current quarter that I simply used that value except for income (for which the choice was lag weights of 0.67 and 0.33 in t and $t - 1$) and the cost-of-capital variables (for which the lag was rectangular for the current and previous seven periods).[8]

Cross-equation constraints. The variables dealt with here are all components of a budget identity, and it is possible to use the identity to improve the efficiency of the parameter estimates. First, one of the dependent variables in the model is defined so that the sum of all five dependent variables is $(F_{-1} + X)/P$, disposable financial resources. When each of the five equations is estimated using the entire set of independent variables, the sum of the coefficients of $(F_{-1} + X)/P$ across all five equations will be unity and the sum of all other coefficients zero, automatically ensuring consistency of the coefficients with the budgetary identity. But this technique does not give uniformly reasonable coefficients because it is not possible to drop any wrongly signed or insignificant independent variable from any equation without violating the identity constraints. As an alternative, both the original paper and this one use a stacking procedure that permits dropping of individual independent variables from certain equations while maintaining the cross-equation restrictions. This procedure involves running regressions with gigantic independent and dependent variables constructed to embody the budget identity. To ensure that no one stack receives disproportionate weight in forming the overall estimates, each stack is multiplied by the inverse of its standard error.[9]

The estimates using the stacking method are given in table 2. The re-

8. Since the lag on income depends mainly on the response of taxes to income changes, it is mildly surprising that it is so short. The reason seems to be that sales, corporate, and income taxes, which now account for over half of aggregate tax revenues of state and local general governments, respond quickly while revenues from the property tax apparently respond very sluggishly, so much so that their responses may be accounted for by deflating income and taxes by prices and population.

Also in this connection, Galper's and my previous article on this subject contained a separate direct lag on X, to see if the coefficients differed from those for F_{-1}. That variable had a t ratio of only 0.9 ("State and Local Fiscal Behavior," table 4), and on another try the significance level was reduced even further. Hence this time around I dropped it.

9. This procedure appears to have been invented but never written up by Frank de Leeuw. I have an appendix, available on request, that describes how I did it in this case. One can also perform the same operations and impose additional constraints on the cross-equation residuals through the use of a generalized least-squares program, but computer costs would rise sharply.

Table 2. Coefficients, Derived by the Stacking Procedure, Explaining the Behavior of State and Local Government Budgets, Quarterly Observations, 1954–74

Independent variable[a] *and summary statistic*	*Dependent variable*[a]				
	E_1/W	E_2/P	E_3/P_k	$-T/P$	$(F_{-1}+X+T-E_2)/P$ $-E_1/W-E_3/P_k$
Independent variable					
$(F_{-1} + X)/P$	...	0.0136 (1.2)	...	0.705 (6.1)	0.9159 (47.8)
Y/P	0.0269 (4.2)	0.0148 (1.4)	0.0163 (1.3)	−0.0825 (−7.7)	0.0245 n.c.
$\frac{1}{m_1} G_1/W$	−0.9032 (−19.6)	...	...	...	0.9032 (19.6)
$\frac{1}{m_2} G_2/P$	...	−0.9631 (−21.0)	...	...	0.9631 (21.0)
K'/P_k	0.0274 (11.6)	0.0182 (3.0)	−0.0011 (−0.2)	...	−0.0445 n.c.
W/P	−159.1 (−6.3)	...	...	...	159.1 (6.3)
$(R + 4\delta)P_k/P$	...	6.48 (3.4)	−5.53 (−2.2)	...	−0.95 n.c.
FEM	...	7.77 (2.1)	...	...	−7.77 (−2.1)
UR	1.22 (2.7)	0.79 (1.1)	...	...	−2.01 n.c.
Summary statistic[b]					
R^2	0.8272	0.8750	0.0647	0.2668	0.9572
Standard error	1.389	2.068	3.931	4.062	5.133
Durbin-Watson	1.89	1.82	1.88	1.04	1.75

Source: Text equation 1.

a. The first five independent variables and all of the dependent variables are deflated by the total U.S. population. *FEM* is the proportion of U.S. families headed by females, and *UR* is the unemployment rate with constant demographic weights. All other variables are defined in the text. All variables are in first-difference form. The numbers in parentheses are *t* ratios.

b. Summary statistics refer to the first-difference residuals.

n.c. Not calculated.

sults of the equations for employment (E_1), other expenditures (E_2), and the surplus are very similar to single-equation estimates of these relations, with only a few insignificant and unimportant variables dropped and virtually no change in the fit statistics.[10] The single-equation estimates for both the construction (E_3) and tax (T) equations had some independent variables that were significant with the wrong sign, however, and that had to be dropped to give sensible structural equations. These equations suffered an increase ranging from 5 to 15 percent in their standard error in the stacked equations shown in table 2.

Estimated Impacts

Interpretation of the coefficients of these equations revolves around the surplus variable. For example, a rise of $1 in GNP (second row) initially raises expenditures by $0.0580 (0.0269 + 0.0148 + 0.0163) and tax revenues by $0.0825. The difference, $0.0245, augments the budget surplus in the short run. But this change in the surplus raises next period's stocks of net financial assets (F) by the same amount, and is thereby gradually dispersed to further increases in expenditures and reductions in taxes. In the long run financial stocks rise to a new equilibrium level, the flow of the budget surplus is unchanged, and both expenditures and taxes are higher by $0.0620.

Table 3 gives short- and long-run coefficients for other important variables. All are computed in a similar manner, except that grant-mandated expenditures are added back to discretionary expenditures to give the results in terms of total expenditures. Estimates of the displacement parameters (γ_1 and γ_2) are very high, so even categorical grants are seen to stimulate only between $0.09 and $0.18 of state-local spending per dollar in the short run, and just slightly more in the long run. These impacts are higher than those for untied grants, however, as would be expected because categorical grants have some relative-price effect at the margin. But the long-run impact of untied grants still exceeds that of a change in private income, confirming the existence of a flypaper effect. Finally, the short-run relative-wage elasticity for compensation expenditures is −0.43

10. Note from equation 3 that if all prices (P, W, and P_k) are equal, the fifth dependent variable becomes $(F_{-1} + S)/P$, and since F_{-1}/P is exogenous, the equation explains S/P.

Table 3. Short- and Long-Run Responses of Expenditures and Tax Revenues to Changes in Income and Grants, 1954–74

Per unit change in the independent variable

	Dependent variable			
	Expenditures		Tax revenues	
Independent variable	Short run	Long run	Short run	Long run
Income, Y	0.0580	0.0620	0.0825	0.0620
Untied grants, X	0.0136	0.1617	−0.0705	−0.8383
Categorical grants, G_1[a]				
$m_1 = 1$	0.0968	0.2429	...	−0.7571
$m_1 = 0.8$	0.1136	0.2632	0.0176	−0.7368
$m_1 = 0.5$	0.1800	0.3241	0.0705	−0.6759

Source: Based on equations of table 2.
a. m_1 is the federal matching ratio.

and the long-run elasticity −0.36, again confirming the relatively low implied price elasticities and expenditure impacts of categorical grants.[11]

Forecasts of Recent Changes

The next issue is to see how well these equations forecast recent changes. Have any recent events—say, the particularly severe 1975 recession—encouraged state and local governments to save more because they now believe it will rain harder or more often? To examine recent behavior, constants were added to the first-difference equations of table 2 to make them perfectly accurate in predicting levels in 1974:4, and a ten-quarter dynamic simulation running through 1977:2 was conducted. The simulation is dynamic because the simulated, not the actual, value of the surplus was used in computing subsequent financial stocks.

The results are given in table 4. In the case of compensation, the model overpredicts expenditures by an amount that gradually grows to \$3.9 billion by mid-1977. These residuals are a good deal larger than the standard error of the regression equation converted to billions of current dollars (in the last row), but that might be expected when the residuals are strongly autocorrelated. The average new residual each quarter is

11. For what it is worth, the grant impacts identified here are below most others reported in the literature and somewhat below those estimated by Galper and myself last time ("State and Local Fiscal Behavior," pp. 42–46). To find a flypaper effect is, however, quite standard.

approximately what is implied by the fitted regressions, and because these residuals are persistently negative, the level of expenditures gradually drifts off. At its peak, however, this residual is still less than 3 percent of compensation expenditures.

The errors in predicting other expenditures are also modest, though their signs are reversed. This equation simulates quite accurately for a year, and then begins gradually to underpredict expenditures; the error peaks at 8 percent of expenditures. The compensation equation (column 1), and the equation for other expenditures (column 2), are quite accurate in predicting total current expenditures (column 3): here the peak error is only 1.3 percent of expenditures. This seems a rather good performance for a ten-period dynamic simulation, though it has obviously been made possible partly by offsetting errors.

The tax residuals are slightly larger, but not as persistent. The tax equation begins by overpredicting and then, halfway through the simulation period, underpredicts. The largest overprediction is 2.5 percent of tax revenues and the largest underprediction, 2.7 percent. When the tax and current-expenditure residuals are combined, as in column 7, the current surplus is seen to be too high by a maximum of $3.5 billion in 1975:2 and too low by a maximum of $1.4 billion in 1977:1. While both errors are still reasonably small for out-of-period dynamic simulations, there is some tendency for the equations to understate the growth of the current-account surplus. Over the period 1975:1 to 1977:2, the actual current surplus grew by $10.8 billion (table 1) and the predicted surplus by $8.4 billion.

Unfortunately, the relatively minor errors for the current budget do not carry over to the capital budget. The simulation predicts construction expenditures fairly well for four quarters, but then the residuals quickly become very large. The construction equation in table 2 simply cannot explain the nosedive in actual construction expenditures. From the peak in 1975:3 to the trough in 1977:1, actual construction expenditures fell by $8.9 billion in current dollars. This represented a 25 percent decline in current dollars and a 31 percent decline in real per capita terms. Over this period capital grants from the federal government grew by $1.2 billion, which meant that mandated spending grew by $1.5 billion and that the fall in discretionary construction expenditures was even larger, $10.4 billion. The equation in table 2 predicted rising construction, however. Real per capita GNP after federal taxes grew by 4.3 percent over this

Table 4. Dynamic Simulation Errors for Expenditures and Taxes of State and Local General Governments, Quarterly, 1975–77

Billions of current dollars, seasonally adjusted annual rate

	Expenditures							
	Current							
Year and quarter	*Compensation* (1)	*Other* (2)	*Total current*[a] (3)	*Construction* (4)	*Total*[b] (5)	*Taxes* (6)	*Current surplus*[c] (7)	*Total surplus*[d] (8)
1975:1	...	0.2	0.2	−1.2	−1.0	−1.7	−1.9	−0.7
2	−0.3	−0.4	−0.7	−0.7	−1.4	−4.2	−3.5	−2.8
3	−1.2	0.3	−0.8	−0.2	−1.0	−4.1	−3.3	−3.1
4	−1.6	0.7	−0.9	−0.8	−1.8	−3.6	−2.7	−1.8
1976:1	−2.3	1.4	−0.8	−3.0	−3.8	−1.2	−0.4	2.7
2	−2.1	3.5	1.4	−5.4	−4.0	0.5	−0.9	4.5
3	−2.7	3.9	1.2	−8.4	−7.2	0.1	−1.1	7.3
4	−3.4	6.0	2.6	−11.8	−9.2	2.6	0.0	11.8
1977:1	−3.3	7.4	4.1	−16.0	−11.9	5.5	1.4	17.5
2	−3.9	8.2	4.3	−15.1	−10.8	4.8	0.5	15.6
Standard error[e]	0.4	0.6	n.c.	1.2	n.c.	1.2	n.c.	1.5

Source: Based on equations of table 2. Figures are rounded.
a. The sum of columns 1 and 2.
b. The sum of columns 3 and 4.
c. Column 6 less column 3.
d. Column 6 less column 5.
e. Fitted equation, converted to billions of current dollars by values of population and prices for 1976.
n.c. Not calculated.

period and the eight-quarter average of current and lagged interest costs on state and local borrowing fell by 62 basis points. Nothing else has an important influence in the equation. Why construction expenditures would have dropped so sharply when both grants and income were rising and interest rates were falling sharply is, to the equation at least, a mystery. The obvious implication of a reasonably well-predicted current-account surplus and a very badly predicted level of construction expenditures is that the predicted overall surplus of general governments is also way off (column 8), with construction accounting for over 90 percent of the largest errors.

The verdict, then, is that there has indeed been an important shift in budget behavior but from an unlikely quarter. Casual reasoning might have suggested that the 1975 recession would have shifted the saving propensity of state and local governments, at least until stocks of financial assets were rebuilt and maybe forever if these governments had come to anticipate more volatility in their revenues. But this does not seem to have happened to any noteworthy degree in the current budget. Out-of-sample simulations of these current operating surpluses predict recent movements at least tolerably well (as well as any ten-period dynamic simulation could be expected to). Where things go haywire is with construction expenditures. Why did construction expenditures take a nosedive in face of rising grants and income and falling interest rates?

What's Ailing Construction?

Attempts to explain a suddenly developing negative residual of $16 billion in the construction equation will, of necessity, have a decidedly ad hoc flavor. I apologize in advance for the lack of rigor in this investigation, but I conduct it anyway to reveal anything that can be learned from an incomplete grilling of the likely suspects.

A first possibility is that the coefficients may simply be misestimated due to some factor such as a short sample period or insufficient variance in the independent variables. One way of checking out this possibility is to estimate the construction equation over the longer period from 1954:1 to 1977:2 to see how the coefficients change and whether the new coefficients improve the simulations at all. Doing so suggests that there have been no important coefficient shifts in any of the other stacked equations (all coefficients are within one standard deviation of their values in table 2), but the coefficients explaining construction do change sharply: the coefficient of income is almost doubled, the coefficient of the capital stock goes from −0.001 to −0.01, and that for interest rates is now very close to zero. Yet even these refitted equations do not help much in the 1975–77 simulation. The largest negative residual is reduced by only $3.2 billion and there are relatively minor changes in the other construction residuals. The unexplained 1976 plunge remains unexplained even if that period is included in the sample.

A second possible explanation is some sort of aggregation problem: perhaps the decline is concentrated in a particular type of construction with a particular explanation. This hypothesis can be broadly checked by using data from the national accounts on the annual breakdown of construction expenditures between education (about 20 percent of the total) and all other. Between 1975 and 1976, real discretionary construction expenditures declined by 19 percent, 22 percent in education and 18 percent in other. According to the Census Bureau's breakdowns in capital expenditures (which at this time are available only through mid-1976), discretionary construction expenditures have fallen at approximately equal rates in highways, water and sewer facilities, and various other categories. More recent and more detailed figures will shed further light; but the scanty evidence so far available suggests that whatever is afflicting construction is afflicting it generally, and is not concentrated in any one category. It seems unlikely that a particular explanation (say, that demographic change is finally cutting into school construction) will suffice.

A third possibility is environmental-impact statements. As a result of the National Environmental Policy Act of 1969, state and local governments are now required to submit such statements on all construction projects financed by federal grants. This legislation should not reduce discretionary construction at all, but various state laws passed at the same time (by California, Michigan, and a few others) could. While there have been some highly visible challenges to projects that dramatize the issue, both the timing and magnitude of any likely effect seem all wrong to explain the residuals in the construction equation. In the first place, only a handful of states have environmental legislation, and even in those states, only a small percentage (5 percent or so) of projects ever get challenged. Second, any slowdown from this source would not have begun suddenly in 1976 but should have been going on for at least four years before that.

Third, the success rate of environmental challenges is actually declining over time. In the early days, it was possible to hold up projects simply because an environmental-impact statement was not submitted; nowadays challengers have to win on the merits of the case. Environmental legislation may be curtailing state and local construction, but all casual evidence indicates that the effect is rather small and not at all concentrated in 1976.

It is not quite so easy to reject the possibility that the nosedive in construction is a delayed reaction to the 1975 recession. There are several variants of this argument. One holds that state and local governments had to restore financial stocks and did so in the only way available to them: by postponing their construction expenditures. A second variant of the argument is that this postponement resulted not from internal reasons but from external credit rationing by lenders. Without putting the matter fully to rest, I should point out that I can find little evidence to support either hypothesis. Regarding internal discipline, the previous statistical estimates indicated that other expenditures and taxes responded to movements in financial stocks (F) and flows (X), but that construction and compensation simply did not (even in the version estimated over the longer 1954–77 period). If no important shift has occurred in those partially sensitive components of the budget as a result of the recession, why should there be such a dramatic shift in a previously insensitive component?

Regarding external rationing, as a result of both the recession and the New York experience, the differential between the rates on Baa and Aaa municipal bonds increased sharply in 1976—from 105 basis points in early 1975 to 190 basis points in late 1976—though it fell back to a normal level of 90 basis points by mid-1977. This spread could indicate that more risky borrowers were being squeezed out of the market, or that the Aaa rate simply underestimated the cost of capital for many borrowers. To assess the simple impact of the higher Baa rate, the previous equations suggest that the maximum effect of this underprediction of rates is less than $2 billion—far short of the residual to be explained—because state and local construction is simply not found to be all that interest sensitive. It is more difficult to assess the impact of any external rationing, but that seems unlikely as the main source of a $16 billion error; the entire volume of new long-term debt floated in 1975 was only $21 billion. Moreover, while new issues of state and local securities did plummet in the New York scare period of late 1975, they have risen very sharply ever since then.

Another variant of the recession argument works through the lag on income. As mentioned above, the surprisingly short lag on income ($0.67Y + 0.33Y_{-1}$) resulted from a joint search to find the form that worked best for all five budgetary dependent variables. The fact that all other budgetary components might be easier to change than construction may have led to an understatement of the construction lag and to an excessively rapid response of construction to the income growth from late 1975 to 1977. I examined the importance of this problem by redoing the simulations with the actual income lag replaced by an eight-quarter rectangular lag for construction only. The results suggested an improvement, but again very modest, cutting only $1 billion from the peak errors.

There is one final possibility. In July 1976, Congress passed a strange piece of legislation called the Local Public Works Capital Development and Investment Act of 1976, as part of the Public Works Employment Act of 1976. This act, intended to stimulate the economy, gave free money (the federal matching ratio, m, was equal to unity) to state and local governments for projects that could be started within 90 days, almost ensuring that the projects were the sort that might have been constructed anyway. The initial appropriation was $2 billion for the period ending September 30, 1977, with no specific allocation formula, and this generated considerable uncertainty among local governments about how much money they could expect. The Economic Development Administration was flooded with applications, totaling $22 billion for the initial $2 billion appropriation, and did not announce the winners until the end of 1976. Then in 1977, Congress debated round two of this program, for which another $4 billion was allocated through a formula not announced until June, but pertaining only to those governments in the initial queue. All the factors—no matching requirements, limitation to quick-starting projects, and prolonged uncertainty over the recipients—served to maximize the extent to which governments might hold up their own discretionary construction until they could see whether the federal government would pay their entire bill. This time both the magnitudes and the timing match very well the pattern of simulation residuals. These residuals begin in mid-1976, when passage of the bill was imminent, and get very large in the interval between rounds one and two. If there is anything to this explanation for the residuals, the Local Public Works Act should qualify

Congress for a Golden Fleece Award:[12] in the name of stimulating the economy, the government passed a $2 billion program that appears to have caused a postponement of as much as $22 billion in total government spending and a reduction in GNP of perhaps $30 billion![13]

Whatever the resolution of this intriguing puzzle, two points must be emphasized. The first is that all of the likely contributors—recession-induced delays, credit rationing, and the delay in public works—are on their good behavior now. The implication of all of these stories is that the construction residual should begin to disappear, implying a fairly hefty growth in at least this component of aggregate demand in the current year.[14]

Second, the implications of this puzzle for overall long-run economic growth should be examined. Superficially, it seems that the recent high level of NIA saving by state and local governments might imply an increase in national saving, to be desired by those favoring measures to improve long-run U.S. growth potential. But a more careful look at the facts indicates that this is exactly the wrong interpretation. At least for general governments, the appropriate concept of saving is the operating budget surplus, not that measured in the national accounts; and while this has increased recently, there has been no important shift in behavior. State and local general government saving is approximately where it should be in this stage of the business cycle. The dramatic shift has been for state and local construction, which should really be classified as national investment, and it has been a strongly downward one. To the extent that it lasts, the reduced level of properly measured investment demand lowers the probability that any level of high-employment national saving can be met with a like amount of national investment.

12. I should point out that the originator of the Golden Fleece Award, Senator William Proxmire, voted against the Local Public Works Act, taking some political risks in doing so.

13. An examination of the Dodge Construction Potentials (contracts) series for public ownership (roughly five-sixths of which are for state and local governments) weakens this case somewhat. This series shows awards declining in the second half of 1975, before my residuals appeared and also before the Local Public Works Act was an imminent possibility (though Congress was holding hearings on the bill at that time). It is unlikely that the bill could explain this early decline in contracts, though it is still the most likely reason that the decline continued throughout 1976.

14. This supposition is also reflected in the aforementioned contracts series, which shows a very sharp growth in early and middle 1977.

Table 5. Impact of the 1975 Recession on State and Local Budgets, and Effects of Countercyclical Revenue Sharing and Public Service Employment, Quarterly, 1974–77

Billions of current dollars, seasonally adjusted annual rate

Year and quarter	Without revenue sharing[a]					Effects of revenue sharing[b]			Effects of public service employment[b,c]		
	Compensation	Other expenditures	Construction	Taxes	Surplus	Expenditures	Taxes	Surplus	Expenditures	Taxes	Surplus
1974:1	−0.5	−0.3	−0.2	−1.6	−0.6	...	...	...	...	...	...
2	−1.0	−0.6	−0.5	−3.2	−1.1	...	...	...	...	...	...
3	−1.4	−0.7	−0.8	−4.9	−2.0	...	...	...	...	...	...
4	−1.6	−0.8	−1.2	−6.5	−2.9	...	...	...	...	...	...
1975:1	−1.8	−0.7	−1.5	−8.4	−4.4	...	...	...	...	...	...
2	−0.8	−0.1	−1.4	−5.8	−3.5	...	−0.1	1.2	0.1	...	1.2
3	−0.5	...	−1.0	−4.6	−3.1	...	−0.3	2.7	0.3	−0.1	2.6
4	−1.0	−0.4	−1.1	−5.5	−3.0	0.2	−0.6	3.1	0.5	−0.3	3.1
1976:1	−0.9	−0.4	−0.9	−4.0	−1.8	0.2	−0.8	2.7	0.5	−0.5	2.7
2	−0.8	−0.4	−0.9	−3.8	−1.7	0.1	−0.9	2.4	0.4	−0.7	2.3
3	−0.8	−0.4	−0.9	−3.8	−1.7	0.2	−1.1	1.1	0.4	−0.8	1.2
4	−0.9	−0.5	−1.0	−4.3	−1.9	0.2	−1.2	0.9	0.4	−0.9	1.0
1977:1	−1.2	−0.7	−1.1	−4.3	−1.3	0.2	−1.2	1.3	0.5	−1.0	1.2
2	−0.7	−0.7	−1.0	−3.3	−0.9	0.2	−1.3	1.2	0.5	−1.1	1.1

Source: Based on equations of table 2 and on text equation 20.

a. Actual less hypothetical.

b. Values with program less values without.

c. Program is assumed to be the same size as the countercyclical revenue-sharing program to facilitate comparisons.

The Cycle and the Stimulus Program

Recently there has been much discussion of a very old problem concerning state and local finances. Since taxes are based partly on income and there is a limit to budget deficits, state and local governments are vulnerable to recessions and this vulnerability may force them to behave in a procyclical manner, raising taxes and cutting expenditures in a recession. To offset these tendencies, Congress has recently enacted a countercyclical revenue-sharing program featuring payments of approximately $2.5 billion per year to state and local governments in areas of excess (more than 4.5 percent) unemployment; the size of the payment depends on the national unemployment rate and payments stop altogether when this rate falls below 6 percent. Simultaneously, there has been a large expansion of the public service employment component of the Comprehensive Employment and Training Act.

In this section I use the model developed above to examine the impact that these programs might have had if they had been in effect throughout the 1975 recession. The first task is to find the effect of the recession itself on state and local budgets. For this, comparisons are made of the results of two dynamic simulations from 1973:4 to 1977:2, the first using the actual pattern of GNP and the unemployment rate and the second using a hypothetical high-employment path (assuming that the national unemployment rate stayed at its early 1974 value of 5 percent and real GNP grew at a 3.5 percent annual rate throughout). The next step is to find the impact of the countercyclical revenue-sharing program had it been in effect throughout this period. For this purpose, the simulation is redone with exogenous budget inflows (X) expanded by the amount implied by today's law (which was not in effect at the time). The changes due to the recession and to countercyclical revenue sharing are then compared. The final exercise examines the impact of a public service employment grant of the same size as the countercyclical revenue-sharing grant by exactly the same method.

The results of these comparisons are given in table 5. The left panel shows the results of the recession on state and local budgets. Compensation payments were nudged down by the drop in income and up by the rise in unemployment (see the coefficients in table 2). The result was a very modest decline of up to $1.8 billion, only 1.5 percent of compensation expenditures, in this period of peak effect. There were press reports of many layoffs in areas where the economic decline hit hard. According to these equations, however, either many of those employees would have been laid off anyway or layoffs by some governments were offset by above-normal hiring by others.[15]

The decline was also relatively modest for other categories of expenditures, but the budgetary changes were larger for taxes. The tax movements consisted of two independent changes: tax revenues declined because of the automatic fall in receipts, but because the surplus and stocks of financial assets also fell, the model estimates that governments raised tax rates to recapture some of these lost assets. The changes in the table measure the net effect of these two forces.[16] In terms of stocks, by mid-1977 the recession had cost local governments \$7.5 billion in financial assets, though of course the number would have been somewhat larger if the discretionary changes in taxes and expenditures had not been made.[17]

The countercyclical revenue-sharing program was assumed to be of the form implicit in the 1977 extension of the program:

$$(7) \qquad \begin{aligned} X &= \bar{X} + 0.5 + 1.2(\overline{UR}_{-2} - 6.0), && \overline{UR}_{-2} \geq 6.0 \\ X &= \bar{X}, && \overline{UR}_{-2} \leq 6.0, \end{aligned}$$

where $\bar{X}$ is the previous exogenous level of budget inflows, X is the new hypothetical level, and $\overline{UR}_{-2}$ is the national unemployment rate two

15. One perhaps little-appreciated aspect of this decline in compensation expenditures involves the nonentrepreneurial Phillips curve, one of Robert E. Hall's many recent contributions to the literature on the Phillips curve (see his "The Rigidity of Wages and the Persistence of Unemployment," *BPEA, 2:1975,* pp. 301–35). There Hall argues that in a recession, private workers might remain unemployed as they wait for higher-wage nonentrepreneurial jobs to open up. The state and local sector now accounts for 14 percent of total civilian employment and 44 percent of Hall's nonentrepreneurial sector. Given that most workers in this sector are known to have occupational tenure, the fact that total state and local employment *declines* in a recession conceivably means that new hires are interrupted altogether, and that the strategy Hall lays out for unemployed private workers is not very rational.

16. Perhaps because they include these induced tax increases, the cyclical changes in taxes shown in table 5 is a good deal less than that estimated by the Council of Economic Advisers, which presented a full-employment budget for both the federal and the state and local sectors in the *Economic Report of the President, January 1977*, p. 76.

17. This number is derived by cumulating the surplus changes and multiplying by 0.25 to account for the fact that all quarterly budget flows are measured at annual rates.

quarters ago (reflecting the delay in computing payments). Under this payment schedule, there would have been no countercyclical payments at all in 1974 and payments would have averaged $2.6 billion since. The allocation of these payments among expenditures, taxes, and the surplus is shown. There is a very slight rise in expenditures, concentrated in the "other" category, and a larger reduction in taxes. Even by the end of 1977, however, much of the countercyclical money is still going into the surplus. As one indication, by the end of 1977 the countercyclical program would have raised state and local financial assets by $4.2 billion, over half of the recession-induced loss, even though the proportion of expenditures it would have restored is a good deal less (only 8 percent by mid-1977).

Even without a formal evaluation of countercyclical revenue sharing, a few points stand out. The first is that any macrostabilization benefits of the program are, if the equations are to be believed, small indeed. Expenditures do not respond much to new infusions of aid, and such response as occurs is felt with very long lags. Taxes respond more, but to the extent state and local taxes are cut, the program is only marginally preferable to straight federal tax cuts. And a large share of the money seems likely to pad the surpluses of state and local governments, in which case there are no obvious macrostabilization benefits.

But maybe macrostabilization is not the important rationale for the program. Another potential rationale views it as a form of economic-disaster insurance for state and local governments. To a growing extent, these governments are relying on cyclically sensitive revenue sources to pay for relatively predetermined expenditures. If they have not accumulated sufficient stocks of financial assets, they are vulnerable to recession-induced fiscal crises, and this program conceivably could have a role to play in warding off those dangers. The equations here show that there is some, perhaps modest, cyclical variability in financial stocks, and that this variability is importantly reduced by countercyclical revenue sharing. Whether the aid goes in fact to the vulnerable governments and whether it may simply encourage governments not to save for cyclical exigencies are questions that can be dealt with only through more detailed research.

A like evaluation can be made of public service employment. The main difference between the two programs is that public service employment is a categorical grant for employment, paid entirely by the federal government. Rather than varying X, public service employment can be simulated by raising G_1, with m_1 fixed at unity. To make this simulation comparable with that for revenue sharing, I have assumed that the size of the grant is given by equation 7, and have presented the results in the right panel of table 5. These results do suggest a somewhat higher short-run response of expenditures, here concentrated in employment; but even with the categorization and the shorter lag the high displacement parameter in the empirical model implies that there is very little difference between public employment and revenue sharing. Again the main impact is on the surplus, and indeed the path of the surplus is much the same in the two simulations. Until some method can be found to avoid displacement, these results suggest that public service employment will prove disappointing as a direct stimulant to employment.

Implications

The implications of this report can be summarized briefly. The rise in the budget surplus of general governments reflects partly a rise in the operating surplus now that the recession trough has been passed, and partly a sharp fall in construction expenditures. The first component can be explained by and large simply by extrapolating earlier fitted equations, and appears to reflect no important shift in behavior. The drop in construction expenditures, however, simply cannot be explained by a traditional set of variables including such things as income, relative prices, grants, and interest rates. There does seem to have been an important behavioral shift here, one that conceivably represents some sort of delayed reaction to the recession-induced loss of financial assets but more likely is attributable to some questionable properties of the Public Works Employment Act of 1976.

The paper also presents a comparison of the hypothetical budget variables in the absence of the 1975 recession on the one hand and, on the other, with the recession cushioned either by countercyclical revenue sharing or public service employment. This comparison shows, first, that at present these programs are much smaller than would be necessary to neutralize the effects of the recession and, second, that the main impact of the recession is on the tax side. Expenditures appear to have been altered little by the recession, nor are they raised much by either countercyclical revenue sharing or public service employment.

Discussion

ROBERT HALL commended Gramlich's paper, suggesting that it might have a broader message. The paper highlighted the perverse anticipatory effects of the public works program of 1976–77. Hall suspected that such phenomena might be quite common for various types of government policy.

Michael Wachter cautioned against drawing the inference that countercyclical grant programs were necessarily ineffective. To him, the lesson was that more attention had to be paid to the mechanisms triggering allocation. George von Furstenberg was less enthusiastic about the potential of such programs. He offered a permanent-income explanation of local government expenditures, suggesting that countercyclical programs might change long-run saving behavior, but that state and local governments might spread the funds over the cycle—saving a portion during recessions to be able to avoid raising taxes later on. But Wachter noted that even if the funds were not entirely spent, they might make an important contribution by keeping local governments solvent during recessions.

Gramlich commented that the perverse effects of the public works program resulted from a combination of three aspects of its procedures: the failure to announce the allocation mechanism; the focus on quick, already conceived projects; and the very high proportion of the costs paid by the federal government. As a result, he was generally sympathetic to Wachter's emphasis on the potential for improved procedures in public works grant programs. He also agreed with the contention that in contrast to the other grants, countercyclical revenue sharing should not necessarily be evaluated in terms of its stimulative effects.

Other discussants expressed some reservations about the paper's explanation of state and local surpluses, and particularly about the role it assigned to the public works program. Arthur Okun argued that, by Gramlich's own figures, the size of the construction shortfall was vastly greater than any conceivable perverse effect of the public works program. At the very extreme, one might suppose that all of the $22 billion of projects in the grant applications would otherwise have been launched in the second half of 1976. Even then, based on the evidence of the normal phasing of "quick" public works projects into expenditures, the resulting shortfall in expenditure rates in the first half of 1977 would have been at most $5 billion—compared with the overall estimated shortfall of $16 billion. He urged Gramlich to view the public works program as *one* of several probable sources—rather than as possibly *the* source—of the construction puzzle.

Saul Hymans was concerned that Gramlich had focused on construction and ignored other components that had sizable errors because those errors could be viewed as offsetting. He said he would feel more comfortable with that procedure if such a pattern of errors prevailed within the sample period of the equations. William Poole and Christopher Sims suspected that New York's fiscal crisis had played a larger role than Gramlich had recognized. Sims noted that the effects had been allowed to work solely through interest rates, ignoring the rationing of loans that stressed soundness of financial positions and that compelled cities to increase their liquidity. Gramlich replied that such effects of the New York situation should have shown up in changes in the behavior of taxes and other expenditures, not just in construction. The concentration of the shortfall in construction suggested to him that the explanation lay elsewhere.