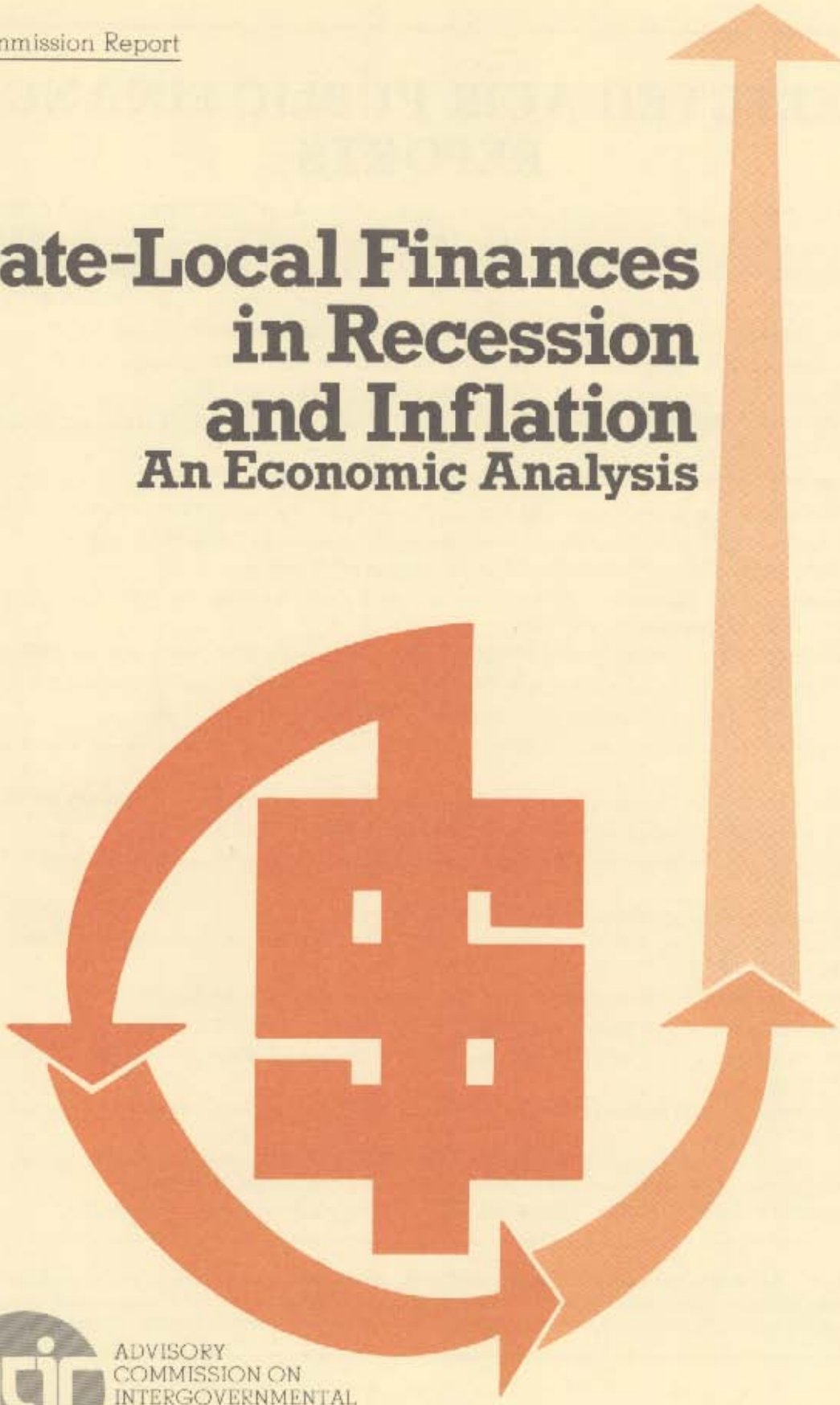
A Commission Report

State-Local Finances in Recession and Inflation

An Economic Analysis



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May 1979

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State-Local Finances in Recession and Inflation

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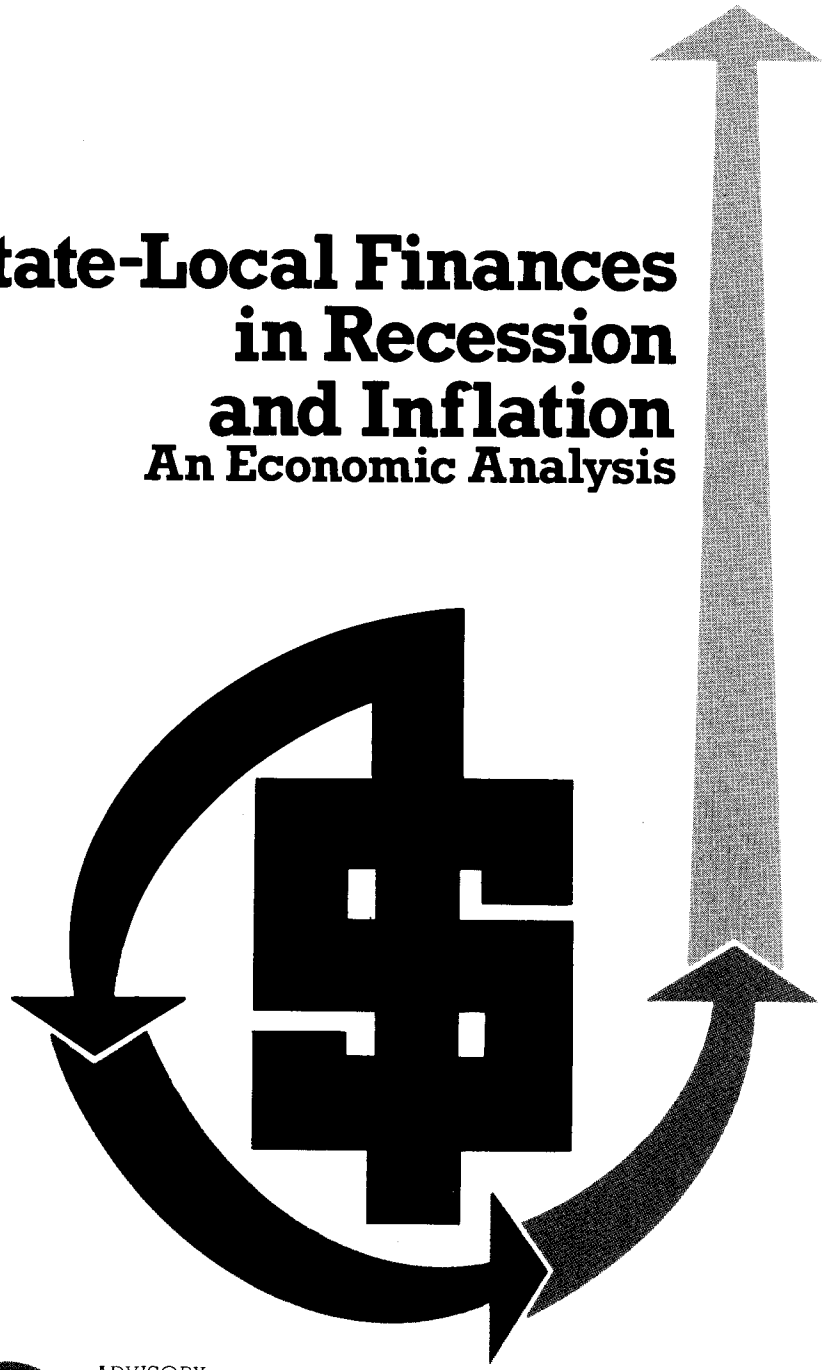

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Preface

In both the *Public Works Employment Act of 1976* (P.L. 94-396, Section 215 (b)) and the *State and Local Fiscal Assistance Amendment of 1976* (P.L. 94-488, Section 145 (a)), Congress asked the Advisory Commission on Intergovernmental Relations to examine the relationship between federal fiscal policy and state and local governments. The recommendations of the Commission, as well as a summary of the background materials, are presented in *Countercyclical Aid and Economic Stabilization* (A-69), issued in December 1978.

This second volume, *State-Local Finances in Recession and Inflation—An Economic Analysis*, presents the economic and statistical analysis done by the Commission staff as background for the Commission's consideration. The staff analysis was directed towards two general questions: how has state-local fiscal behavior affected the national economy since World War II, and how has the business cycle affected state and local government fiscal behavior during the period? It is our hope that publication of this technical study will contribute to increasing understanding by both economists and the public of an important area of intergovernmental relations.

Acknowledgements

This economic analysis of the state and local role in federal economic stabilization policy was prepared by John P. Ross and Richard J. Reeder under the supervision of John Shannon, assistant director for taxation and finance. Frank Tippett assisted with the data sources. Susannah E. Calkins prepared the report for publication. Lavinia B. Clarke typed the many drafts of the report and Ruth Phillips and Jean Ryan provided additional secretarial help.

The Commission and the staff benefited from the help of many individuals and organizations. Special gratitude is expressed for the comments and suggestions provided by participants at both the "thinkers' session" where the outline and study design were reviewed and the "critics' session" where the draft report and optional policy recommendations were discussed prior to consideration by the Commission. The participants were Stephen Barro, Herbert Becker, Carol Berenson, Dorothy Brodie, Arthur Corazzini, Peggy Cuciti, Martha Darling, Gene Dodaro, Dennis Dugan, John Duncan, Jeff Esser, John Fava, Aliceann Fritschler, Alvin From, Delphis Goldberg, David Greytak, Richard Gustely, Janet Hoffman, Jacob Jaffe, Lee Enfield Lockwood, James Martin, Richard Nathan, Leo Penny, John Petersen, George Peterson, Kent Peterson, David Puryear, Robert Rafuse, Robert Reischauer, Ralph Schlosstein, Jerry Shipley, Francis Viscount, and Charles Warren.

Full responsibility for the content and accuracy of the study rests, of course, with the Commission and its staff.

Wayne F. Anderson
Executive Director

John Shannon
Assistant Director
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The Effects of State-Local Fiscal Behavior on The National Economy Since World War II

The purpose of this section is to examine the impact of state and local government financial behavior on the national economy, with particular attention to the 1973-75 recession and subsequent recovery.[1] Part one presents recent trends in intergovernmental finance which are necessary background for examining the interaction between the financial activities of state and local governments and the national economy. The second part discusses state and local fiscal behavior during periods of recession and recovery since World War II; using a number of different measures, the question of whether state and local fiscal behavior was "perverse" rather than countercyclical is examined. Part three reviews the relationship of fiscal coordination to inflation. The fourth, and final part, is a summary of the findings of this section.

The entire analysis concentrates on aggregate state and local fiscal behavior. There are two reasons. First, the data necessary for disaggregation is not readily available; quarter-by-quarter data on the financial behavior of individual state, county, or city governments is not collected on a comparable basis. Second, the impact of the state and local government sector on the national economy is a question of aggregates since an individual state or local government has very little impact on the national economy. However, the impact of all state and local governments can be substantial, and it is the overall impact which is important in examining fiscal coordination.

THE INTERGOVERNMENTAL FINANCIAL SYSTEM

Before examining the impact of state and local financial behavior on the national economy, there are three recent trends in the intergovernmental financial system which should be described: the growth of the state and local public sector, the growth of federal aid, and the resulting increase in the reliance of state and local governments on federal aid.

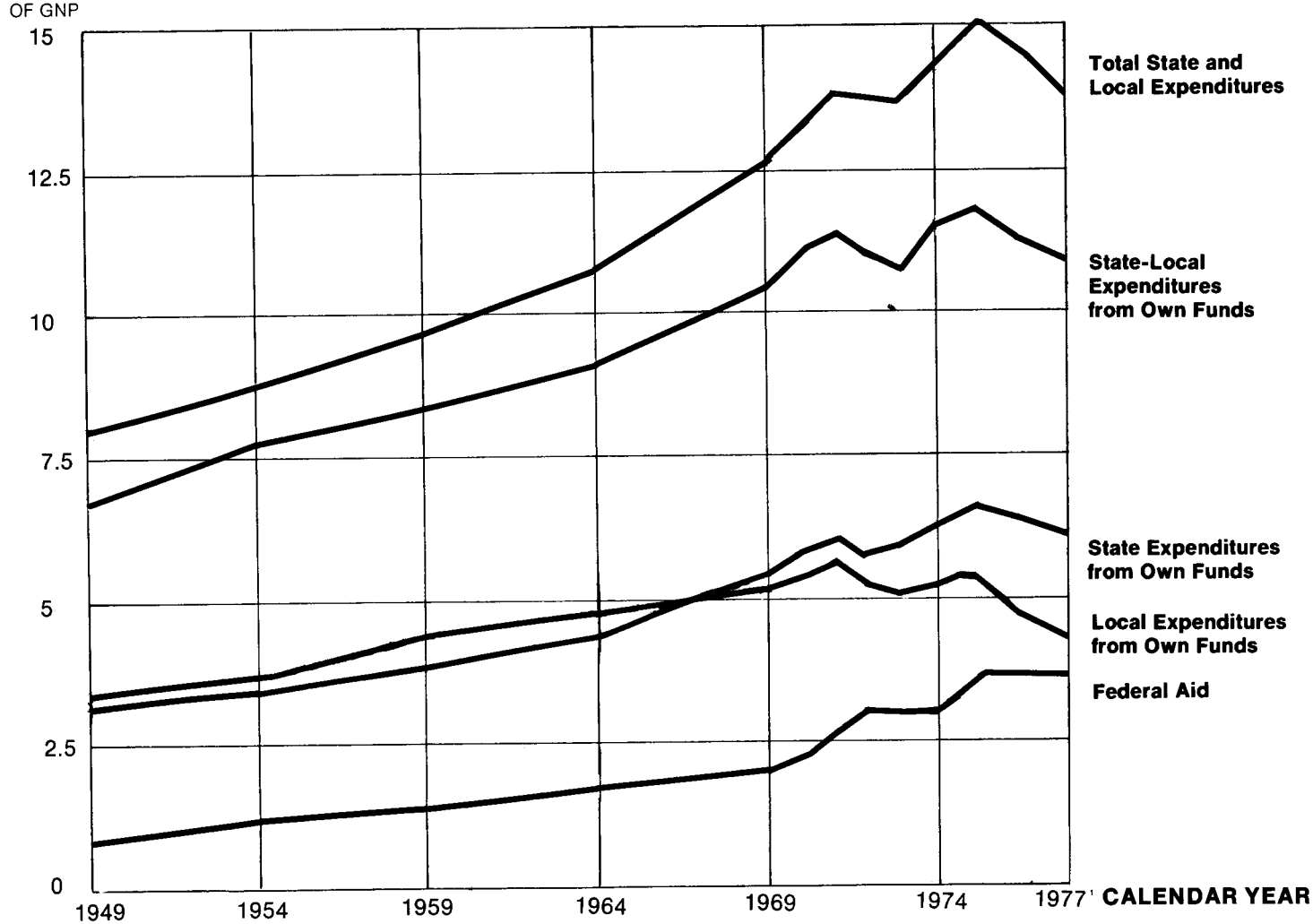
Growth of the State and Local Public Sector

During the 1960s and early 70s the state-local public sector was one of the most rapidly growing parts of the national economy (*Chart 1*). Throughout this period state and local government expenditures from own sources were taking a larger and larger share of total GNP, with total state and local government own source expenditures rising from 9% of GNP in 1964 to 11.5% in 1975. Local government spending from own sources reached a high of 5.4% of GNP in 1971 while relative state own source expenditures peaked in 1975.

While total state and local government expenditures continued to grow, in recent years the growth of their own source expenditures relative to that of the national economy has markedly slowed. Local government own source expenditures dropped from the 1971

Chart 1

STATE AND LOCAL GOVERNMENT EXPENDITURES AS A PERCENTAGE OF GROSS NATIONAL PRODUCT, 1949-77



¹*preliminary estimate*

SOURCE: ACIR Staff Calculations.

peak of 5.4% to 4.7% of GNP in 1977. Relative state own source expenditures dropped from a 1975 peak of 6.3% to 5.8% in 1977.

In the three-year period 1974-77, GNP grew at an average annual rate of 10.2%, but state own source expenditures grew by 8.3% per year, and local own source expenditures grew by only 6.6% per year. As a result, the ratio of both state expenditure and local expenditure growth to GNP growth was less than one—the lowest in any period since 1954[2] (Table 1).

The relative growth that has occurred in the state and local sector since 1972 is primarily the result of increases in federal aid. Until recently these increases have been more than sufficient to keep the state and local sector moving faster than GNP. While it may be an overstatement to say that federal aid has become the force driving state and local governments' fiscal motors, it has certainly become important in maintaining their relative fiscal growth.

Table 1

GROWTH OF STATE AND LOCAL SECTORS RELATIVE TO GROSS NATIONAL PRODUCT, 1954-77

State Sector

Five-Year Period Ending:	Growth Rates (average annual percent change) GNP	State Own Source Expenditure[1]	Ratio of State Expenditure Growth to GNP Growth
1954	7.3	7.4	1.01
1959	5.8	8.0	1.38
1964	5.5	7.9	1.44
1969	8.0	12.7	1.59
1974	8.6	11.7	1.36
1977[2]	10.2	8.3	0.81

Local Sector

Five-Year Period Ending:	Growth Rates (average annual percent change) GNP	Local Own Source Expenditure[1]	Ratio of Local Expenditure Growth to GNP Growth
1954	7.3	9.8	1.34
1959	5.8	8.0	1.38
1964	5.5	7.7	1.40
1969	8.0	9.1	1.14
1974	8.6	8.8	1.02
1977[2]	10.2	6.6	0.65

[1]The National Income and Product Accounts do not report state and local government data separately. The state-local expenditure totals (National Income Accounts) were allocated between levels of government on the basis of ratios (by year) reported by the U.S. Bureau of the Census in the governmental finance series.
[2]Three-year period ending in 1977.
SOURCE: ACIR staff compilation based on U.S. Department of Commerce, Bureau of Economic Analysis, *Benchmark Revision of National Income and Product Accounts,* and *Survey of Current Business,* various issues.

The Flow of Federal Aid and The Business Cycle

The major statement that can be made about federal aid to both state and local governments is that it has been growing (*Chart 2*). Emphasizing categorical program objectives, these aids have grown regardless of the particular phase of the business cycle.

Two additional conclusions can be drawn from an examination of real federal aid flows. First, the flow of real federal aid has behaved very erratically since 1971. The quarter-by-quarter swings in real aid are now much more severe than in earlier periods. Such erratic behavior cannot be expected to elicit stable responses on the part of state and local governments. Second, President Nixon's attempts at impoundment can be seen in the slowdown of aid in late 1972 and 1973; however, those slowdowns were badly timed as far as the business cycle was concerned.

The flow of federal aid funds to state and local governments has not been used as a countercyclical tool. In general, its main purpose has not been to counter cyclical swings in the national economy. Other program objectives were more important in determining the dollar amounts distributed by the federal government to state and local governments.

Increasing Dependency of The State and Local Public Sector

In recent years, state and local governments' reliance on direct federal aid has substantially increased. Federal aid as a percent of state and local government own source general revenue rose from 11% in 1957 to 28% in 1976.

The trend toward increased reliance on federal aid is particularly noteworthy for local governments. In some of the larger cities the increases in federal aid have been very rapid. For example, the 47 largest cities, excluding New York, received only $0.03 in direct federal aid for every dollar of own source revenue in fiscal year 1957 (*Table 2*). In fiscal year 1976 they were receiving $0.34 and by fiscal year 1978 it is estimated that they will be getting on the average about $0.50 in direct federal aid for every dollar of own source general revenue.

These three findings—the slowdown in the relative growth of the state-local sector, the past lack of interest in using federal aid as a countercyclical tool, and the increasing dependency of state and local governments on federal aid—are important in considering a stabilization policy which directly includes state and local governments because they indicate the increased vulnerability of the state-local public sector to changes in federal aid.

Increased state and local government vulnerability, however, may be more apparent than real because rapid termination of federal aid programs is extremely difficult to achieve. The severe financial stress which many jurisdictions within the system would suffer from major cutbacks places a significant political constraint upon reductions in federal aid. For example, a federal decision to cut back Cleveland's direct federal aid to its fiscal year 1976 level would undoubtedly send that city government through its fiscal windshield.[3]

This fiscal fact of life introduces an element of "stickiness" into federal budget policies and suggests that significant changes in federal aid flows will usually be found on the increase rather than decrease side of the budgetary ledger.

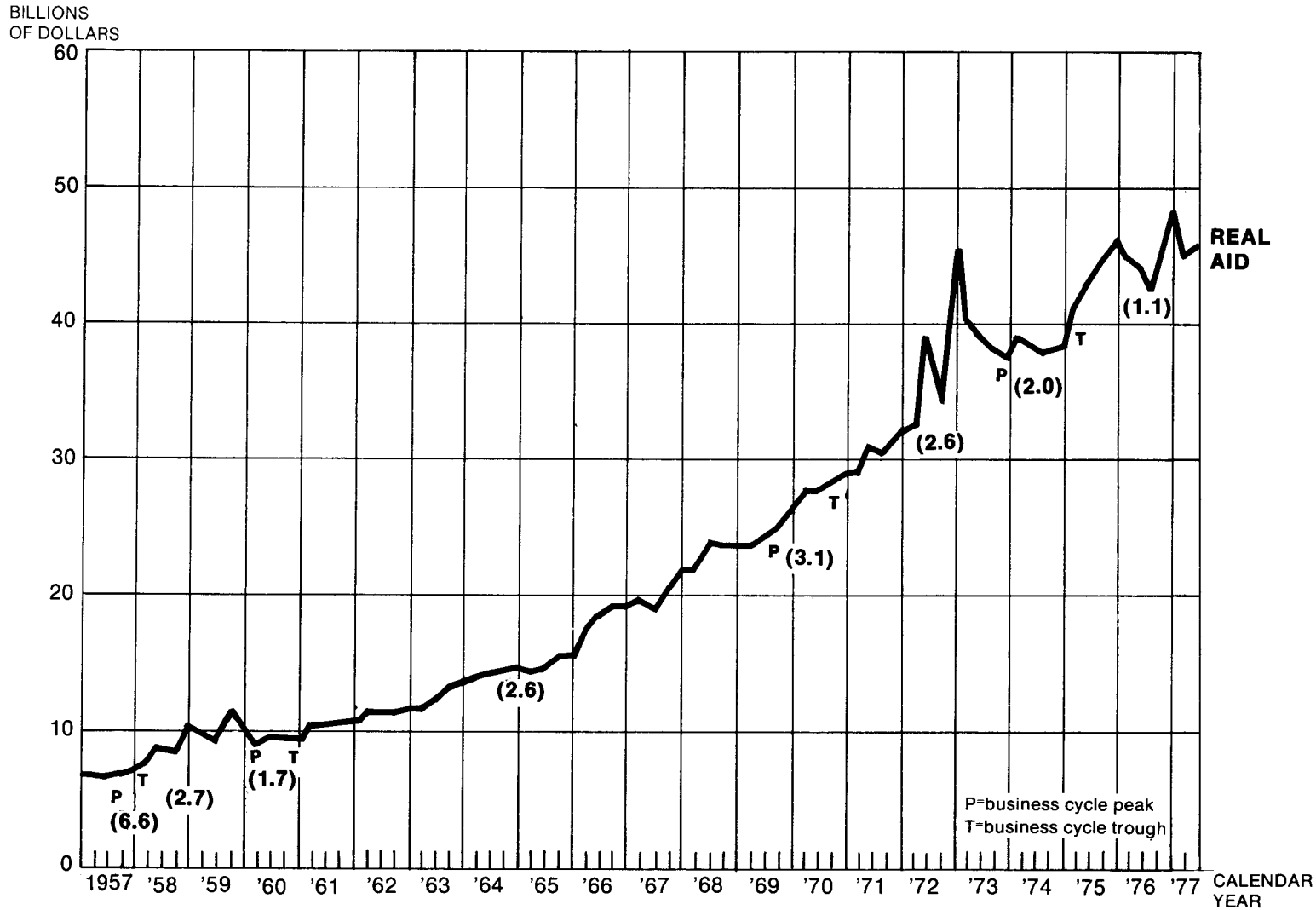
FISCAL COORDINATION AND THE BUSINESS CYCLE

Fiscal coordination during recessions involves the relationship of the financial behavior of state and local governments to national stabilization policy. Do these governments act "perversely" with respect to national fiscal policy—by raising taxes and/or reducing expenditures during recessions—or do they behave countercyclically, thus making the goal of economic stabilization easier to reach?

In general, the empirical studies of state and local government finances since World War II found that they behaved in a countercyclical fashion during recession. However, there is no single "magic number" nor is there a single method for measuring the degree of fiscal coordination. These previous studies have employed a variety of different methods resulting in numerous "magic numbers." Four indicators of state-local stabilization performance have been used in this study: state-local budgets, state-local surpluses as a percent of GNP, state-local employment, and state-local fiscal leverage.

Chart 2

FEDERAL AID IN 1972 CONSTANT DOLLARS (AVERAGE QUARTERLY RATE OF GROWTH BETWEEN BUSINESS CYCLE AND TROUGHS IN PARENTHESES) 1957-77



SOURCE: ACIR Computation, based on U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, various issues.

State and Local Government Budgets: Expenditures, Receipts, and Surpluses

Table 3 shows the average quarterly rates of change of state and local expenditures, receipts, and surpluses for each cyclical swing since 1957. For each of the recessions, expenditures grew more rapidly than receipts, and surpluses fell. Thus during each recession state and local governments added to the income stream thereby increasing aggregate demand. While these rates of change are only rough indications of the fiscal impact of state and local government behavior, they do point to the conclusion that state and local governments have acted as a stabilizing force during these recessions.

In periods of expansion state and local government receipts grew more rapidly than expenditures, and surpluses increased. In each of the expansions since the fourth quarter of 1960, receipts have outgrown expenditures at a progressively more rapid rate. During the present expansion, expenditures have been growing at an average quarterly rate of 1.8% whereas receipts have grown by an average of 2.9% per quarter. State and local government surpluses have increased, in annual rates, by about $3 billion each quarter.

Rough as this evidence is, it points to the conclusion that state and local government financial activity tended to be in a countercyclical direction during each of the recessions. With each expansion since 1960, state and local behavior has tended to be more stabilizing than during the previous expansion. As a matter of fact, state and local governments are applying the financial brakes so hard during

Table 2

DIRECT FEDERAL AND STATE AID TO THE NATION'S 47 LARGEST CITIES,[1] SELECTED YEARS 1957-78

Source of Funds	FY 1957	FY 1967	FY 1976	FY 1978 Est.
	Total Federal and State Aid (in millions)			
Federal	$ 65.3	$ 406.0	$3,182.6	$5,395.0
State[2]	444.3	896.4	2,795.0	3,837.0
Total	509.6	1,302.4	5,977.6	9,232.0
	Per Capita Federal and State Aid[3]			
Federal	$ 2.33	$13.14	$101.56	$172.16
State[2]	15.84	29.00	89.19	122.44
Total	18.17	42.14	190.75	294.60
	Federal and State Aid as a Percent of Own Source General Revenue			
Federal	2.6%	9.4%	33.9%	49.7%
State[2]	17.9	20.7	29.8	35.4
Total	20.5	30.1	63.7	85.1

[1]Excluding New York City.
[2]Includes an unsegregable amount of federal aid passed through the states to cities.
[3]Based on the following population estimates: 1957, 1950 population; 1967, 1960 population; 1976 and 1978, 1975 population.
SOURCE: ACIR staff computations based on U.S. Bureau of the Census, *City Government Finances in 1957, 1967, and 1976.* Estimated own source general revenue and state aid for 1978 based on annual average increases between 1971 and 1976. Federal aid estimates for 1978 based on Department of the Treasury, *Fiscal Impact of Economic Stimulus Package on 48 Urban Governments,* A Memorandum for the Urban and Regional Policy Group, November 8, 1977; and ACIR staff estimates.

Table 3

STATE-LOCAL FISCAL BEHAVIOR: AVERAGE QUARTERLY RATES OF GROWTH OF EXPENDITURES, RECEIPTS, AND SURPLUSES 1957-77

During Recessions

Contraction[1] (peak-trough)	Expenditures[2] (average quarterly rate of growth in percent)	Receipts (average quarterly rate of growth in percent)	Surplus (average quarterly change: billions of dollars)
1957: III-1958: I	2.9%	1.7%	$-0.55
1960: I-1960: IV	2.1	1.9	-0.10
1969: III-1970: IV	3.2	2.8	-0.46
1973: IV-1975: I	3.3	2.6	-1.32

During Expansions

Expansion[1] (trough-peak)	Expenditures[2] (average quarterly rate of growth in percent)	Receipts (average quarterly rate of growth in percent)	Surplus (average quarterly change: billions of dollars)
1958: I-1960: I	1.5%	2.4%	$0.34
1960: IV-1969: III	2.4	2.5	0.08
1970: IV-1973: IV	2.5	2.9	0.80
1975: I-1977: I	1.8	2.9	2.95

[1]Peak and trough quarters used are for real GNP, as identified by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA).

[2]Total expenditures, receipts, and surplus were used to compute the above, hence federal aid and trust fund amounts are included.

Source: ACIR staff computations, based on U.S. Department of Commerce, BEA, *Survey of Current Business*, various years.

the present expansion that they may be actually slowing the recovery process.

State and Local Government Surpluses As a Percentage of GNP

When changes in state and local surpluses are compared to changes in the national economy, during each recession since 1957 state and local government surpluses as a percentage of GNP fell (*Chart 3*). Since GNP was also falling during the recessions, these percentage declines mean that surpluses were falling faster than the decline of the national economy. This fact lends support to the contention that state and local government financial behavior was actually retarding the recessions and helping to bring about recovery.

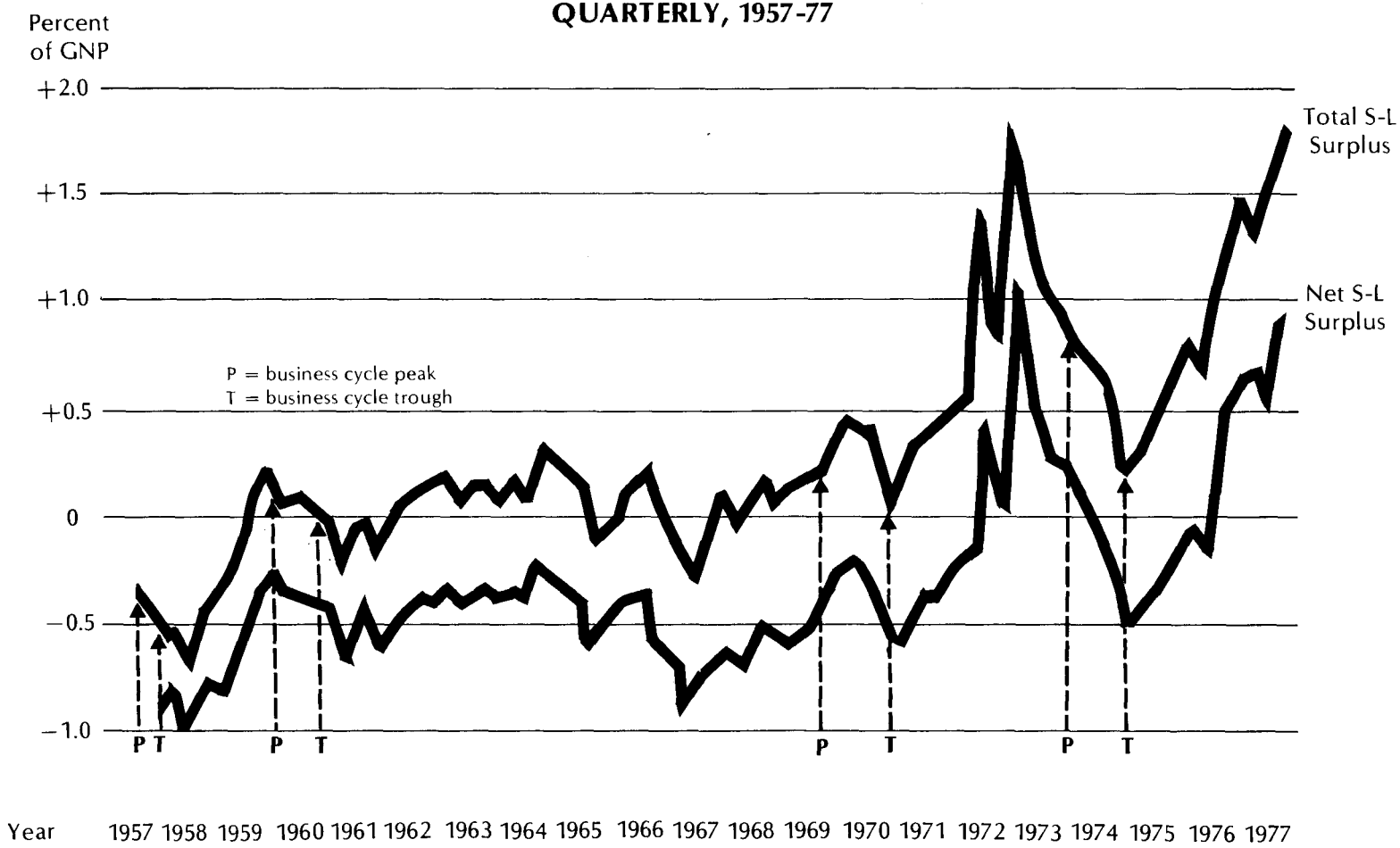
The pattern during expansions has been mixed. For the 1970-73 recovery, state and local government surpluses rose faster than the overall economy, and net surpluses became positive for the first time since 1957.

At least a part of the build-up of surpluses may have been due to the adjustment process following the introduction of general revenue sharing. Surpluses as a percentage of GNP peaked and then fell until the trough in 1975. Since 1975 state and local government surpluses have been increasing faster than GNP.

As evidenced by the growth in surpluses as a percentage of GNP, during the last two expansions the financial behavior of state and local governments has tended to be stabilizing. They have rebuilt depleted surplus accounts and slowed the national economic expansion. However, the magnitude of this behavior may have been excessive. In both instances, surpluses rose very rapidly after the trough and

Chart 3

STATE AND LOCAL SURPLUS AS PERCENT OF GNP: TOTAL AND NET OF SOCIAL INSURANCE FUNDS QUARTERLY, 1957-77



Source: ACIR computations based on U.S. Department of Commerce, BEA, *Survey of Current Business*, various years.

may have actually slowed recovery more than necessary.

State and Local Government Employment

The major identifiable trend in state and local government employment is growth regardless of the particular phase of the business cycle the economy happened to be experiencing (*Table* 4).

As would be expected, private sector employment fell during every recession and grew during every expansion. Total public sector employment appears to be much less sensitive to swings in the business cycle. In every period except for a very slight drop in the 1969-70 recession, total public sector employment grew. During the business cycle from the 1960-61 recession through the long 1961-69 expansion, federal government employment grew at the same average annual rate as total private sector employment. In every other period, federal employment fell.

State and local government employment on the other hand grew continually from 1957 to 1976. Only during the present recovery has private sector employment grown faster than state and local government employment. The employment growth during recessions indicates countercyclical behavior. But the trend over the past four recessions has been one of declining rates of growth in employment, perhaps indicating that the robustness of this

Table 4

PRIVATE AND PUBLIC SECTOR EMPLOYMENT, 1957-76
(Full-Time Equivalent Employees)

During Recessions

Contraction[1] (peak-trough)	Private Sector (average annual growth in percent)	Public[2] Sector (average annual growth in percent)	Federal[2] (average annual growth in percent)	State-Local (average annual growth in percent)
1957-58	-4.0%	0.0%	-3.8%	5.1%
1960-61	-1.0	3.4	2.0	4.7
1969-70	-0.9	-0.3	-5.8	4.3
1973-75	-1.4	1.8	-0.6	3.1

During Expansions

Expansion (trough-peak)	Private Sector (average annual growth in percent)	Public[2] Sector (average annual growth in percent)	Federal[2] (average annual growth in percent)	State-Local (average annual growth in percent)
1958-60	2.4%	1.9%	-0.1%	3.9%
1961-69	2.9	3.7	2.9	4.4
1970-73	2.6	0.5	-4.7	4.3
1975-76	3.6	0.3	-1.0	1.0

[1]Calendar year peaks and troughs chosen to most closely reflect employment at peak and trough months as measured by BEA.
[2]Includes military.

Source: ACIR staff computations, based on U.S. Department of Commerce, BEA, *Survey of Current Business*, various years.

source of countercyclical behavior may become less reliable in the future. The employment growth during expansion indicates procyclical behavior. In each expansion, however, the growth rate of state and local government employment was the same or slower than in the preceding recession; hence, there is at least some tendency toward moderating the procyclical impact during periods of expansion.

State and Local Government Fiscal Leverage

There is a well recognized problem with using receipts, expenditures, and employment to measure state and local governments' fiscal impact on the national economy. An expenditure increase of $1 billion *expands* the economy by more than a $1 billion increase in receipts *slows* the economy. Thus a $1 billion increase in both taxes and spending, which has no immediate affect on the surplus, is not a neutral transaction, but instead stimulates the economy. Similarly, even if public employment increases, if total expenditures decline, or if taxes rise at a rapid rate, the overall fiscal impact could be contractionary.

In an attempt to improve over these simple but potentially misleading measures, the concept of fiscal leverage, which brings together both the tax and the expenditure sides of the budget, was used to estimate the impact of state and local government fiscal behavior on the national economy for each recession and expansion since 1957. The leverage measure employed uses different weights for expenditures, taxes, and transfers in determining the combined impact of fiscal behavior. It also allows for other important factors ignored by the simpler measures, such as the time lag between the initial fiscal impact and subsequent delayed effects, and inflation adjustment factors. (For an expanded discussion of this concept see *Appendix B.*) The estimates of impact are presented in *Table 5.*

The fiscal leverage estimates indicate that state and local government financial behavior added to real GNP during the 1973-75 recession. If federal aid is included, state and local government financial actions retarded that recession by almost 17%. In other words, real GNP would have fallen by 17% more than it actually did had it not been for the fiscal influence of state and local governments. Excluding federal aid, the state-local sector slowed the recession by more than 14%.[4]

The only trend observable during the postwar period is the reduction in the stabilization provided by state and local governments, excluding federal aid, during the last three recessions (33.3%, 30.2%, 14.4%). In only one of the six postwar recessions studied did the inclusion of federal aid add more than 2% or 3% to the stabilizing influence of state and local government fiscal behavior.

With the exception of the present recovery, state and local governments' financial behavior added to economic expansion during each recovery period. It may be argued that such behavior is procyclical, but increasing federal aid, at least to some extent, accounts for the procyclical behavior during each of these periods.

The trend has been one of less and less stimulation during expansionary phases of the business cycle. If one disregards the period of steady growth from 1960 to 1969 on the grounds that it does not represent a typical business cycle expansion, the state and local contribution to the last four business cycle expansions has declined significantly (18.1%, 1.9%, 0.1%, -6.6%). Hence, the trend is one toward stabilization during economic expansions, i.e., toward countercyclical behavior.

In summary, fiscal leverage estimates indicate countercyclical financial behavior on the part of state and local governments during every recession since 1948. The fiscal record during economic expansions is mixed, but the trend appears to be toward countercyclical behavior.

Automatic v. Discretionary Changes

The evidence above indicates the overall impact of state and local fiscal activity on the national economy. That overall activity can be broken down into two types: automatic changes—those changes that occur automatically in response to changes in the level of income—and discretionary changes—those changes that result from direct decisions made by state and local government policymakers. An example of a discretionary change is an

Table 5

STATE-LOCAL TAX AND SPENDING POLICIES: ESTIMATES OF THEIR EFFECTS ON THE ECONOMY DURING PERIODS OF RECESSION AND EXPANSION 1948-77

During Recessions

Contraction[1] (peak-trough)	Change in State and Local Leverage[2] (billions of 1972 dollars) Including Federal Aid	Excluding Federal Aid	Percent Contraction Reduced by State and Local Financial Behavior Including Federal Aid	Excluding Federal Aid
1948 IV-1949 IV	$ 8.7	$ 7.9	55.9%	53.7%
1953 II-1954 III	6.0	6.6	22.7	24.2
1957 III-1958 I	4.7	3.4	17.5	13.3
1960 I-1960 IV	4.0	4.2	32.5	33.3
1969 III-1970 IV	11.9	5.2	49.8	30.2
1973 IV-1975 I	14.7	12.1	16.8	14.4

During Expansions

Expansion (trough-peak)	Change in State and Local Leverage[2] (billions of 1972 dollars) Including Federal Aid	Excluding Federal Aid	Percent Expansion Intensified or Slowed Down (-) by State and Local Financial Behavior Including Federal Aid	Excluding Federal Aid
1949 IV-1953 II	$ 4.7	$ 3.6	3.5%	2.7%
1954 II-1957 III	15.0	12.2	23.2	18.1
1958 I-1960 I	6.5	1.4	9.2	1.9
1960 IV-1969 III	69.0	44.6	24.4	14.5
1970 IV-1973 IV	19.4	0.1	12.8	0.1
1975 I-1977 II	-0.5	-11.4	-0.3	-6.6

[1]Peak and trough quarters are for real GNP, as measured by BEA.

[2]This form of leverage is adjusted for inflation and includes lag effects, thus the change in leverage represents the addition to real GNP due to present and past state and local fiscal behavior.

Source: ACIR computation, based on U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, various years.

increase in property tax rates. Rising sales tax revenues resulting from increased sales is an example of an automatic change.

Some economists argue that the issue of fiscal coordination should concern only discretionary changes rather than overall impact. For the 1973-75 recession, the discretionary behavior of state and local governments was not "perverse." The *Survey of Current Business* reported that none of the increase in state and local government own source receipts was due to tax rate increases in 1974—the most severe year of recession.[5] The ACIR survey of major state tax sources found that for fiscal year 1975 only 10% of the increase in state revenues was due to political action—well within the normal range for other years.[6]

As another way of examining discretionary actions, fiscal leverage was again calculated using estimated full employment revenue. The result was to reduce the stimulative impact of state and local governments; however, that impact remained countercyclical in character (*Appendix B*).

Explaining the Countercyclical Behavior Of State and Local Governments During Recessions

During a recesssion how do state and local governments manage to maintain or even increase their expenditures in the face of revenue declines and thus help to stimulate the economy?

Two factors appear to be important in explaining this process. First, most state and local governments operate on either one or two-year budget cycles. Revenue estimates are made and expenditures are planned for the entire budget period. If revenues fall short of estimated amounts, there is a time lag before expenditure adjustments can be made. Most of the recessions since World War II have not lasted long enough for state and local governments to cut expenditures.

A second and probably more important factor is that state and local governments are expected to have balanced budgets. Since these governments must at least plan a balanced budget, their tendency is to estimate revenues conservatively. If the economy is booming these conservative estimates may understate actual collections and result in unplanned surpluses. During a recession it appears that state and local governments draw down these surpluses, enabling them to maintain or increase expenditures.[7]

From 1950 through 1975, state and local governments' net operating balances have only been in surplus for two years. These two years, 1972 and 1973, were also the years when general revenue sharing was introduced into the system. However, these two years of surplus did place state and local governments in a particularly strong position to face the 1973-75 recession. Operating balances (as a percent of GNP) began to fall in late 1972 and continued to decline until the trough of the cycle was reached in the first quarter of 1975 (*Chart 3*). Since that quarter, state and local governments have been in the process of rebuilding their net surplus position.

If one accepts the process described above, then several inferences can be drawn to help predict the impact of state and local governments during business cycles in the future. The lagged expenditure adjustment process indicates that the degree of stabilization during recessions depends largely on the rate of growth of planned expenditures which in turn depends on the long-run rate of growth of the state and local sector. Hence, a slower real growth rate of the state and local sector in the future could reduce the countercyclical (stimulating) influence of state and local governments during recessions. Following the same logic, slow growth, combined with lagged cutbacks in expenditures, could increase the countercyclical (dampening) influence of the state-local sector during economic expansions.

The importance of accumulated surpluses leads to a second inference: the larger the state and local sector's accumulated surplus at the beginning of a recession, the more able the sector will be in countering a recession. Similarly, the existence of strict limitations on surplus accumulation, debt, and expenditures, could restrict state-local potential for stabilization during recessions. This could be particularly true for prolonged and/or severe recessions which may cause existing surpluses to be depleted before the trough of the recession is reached.

Findings on State and Local Government and the Business Cycle

Based on an examination of these four indicators, it may be concluded that during each economic downswing since World War II, state and local government fiscal behavior was countercyclical because it added to aggregate demand. This judgment holds whether we use the "traditional" yardstick—the national business cycle—or the newer and more "activistic" measure—potential full employment. However, during the present economic recovery the contribution of state and local fiscal behavior is questionable. If we use the conventional business cycle yardstick, the present state-local fiscal impact is countercyclical—governments are rebuilding their surpluses and not increasing aggregate demand. However, when federal aid is excluded, the magnitude of the state-local fiscal slowdown, given the slowness of the recovery, may be too severe. If the potential full employment yardstick is used, then the dampening effect of state-local fiscal behavior, excluding federal aid, is working

against a timely economic recovery. With federal aid, the state-local government impact is almost neutral.

There are indications, from this empirical analysis and from the theoretical explanations provided here, which suggest that the future antirecession influence provided by state and local governments may be considerably less than in the past 30 years. Recent trends indicate that the state-local sector, by itself, is providing less and less stimulation during recessions, and during recoveries the trend is toward slowing down or dampening the expansions. Whether such trends continue or not depends partly on the rate of future growth of the state and local sector and partly on the ability these governments will have to accumulate surpluses so that they may maintain expenditures during recessions.

FISCAL COORDINATION DURING INFLATION

Coordinating federal government anti-inflation policies with the actions of state and local governments has proved to be a formidable task. The principal difficulty lies in the ability to define and deal with the causes of inflation. Recent experience has even led some economists to reject the notion that fiscal policy can be an effective tool for fighting inflation; they would have exclusive emphasis placed on monetary policy.

State and Local Governments And the Present Inflation

It is useful to review the behavior of state and local governments and attempt to measure their impact on inflation. The general finding of such a review is that, at least for the present, state and local government fiscal behavior is not a major force driving the inflation.

The evidence for this finding rests upon both the impact of state and local governments on aggregate demand and the distribution and prices of their purchases. As with any growth sector in the economy, state and local government behavior increases aggregate demand and, in those cases where inflation is caused by excessive demand, adds to inflationary pressures. However, the present inflation is not the result of excessive demand; most economists agree that it is due to structural imbalances in the economy. Because certain kinds of commodities and resources are in short supply, their prices have escalated, driving up the rate of inflation. State and local governments spend most of their tax dollars for personnel. Given present rates of unemployment, personnel is not one of those factors generally in short supply.

In addition, the pressure state and local government purchases are placing on the economy during expansions has been slackening. During each expansion, receipts grew more rapidly than expenditures and surpluses rose. The leverage measure in *Table 5* indicates that excluding federal aid, state and local government fiscal behavior added less than 0.1% to the 1970-73 expansion.

The idea of the so-called "8-and-6 combination" has received a great deal of recent attention. The contention is that present inflationary expectations and the institutional characteristics of the modern economy result in a basic "underlying rate" of inflation of 6% per year. With a 6% rate, total annual wage increases will be about 8% per year. The argument suggests, that the way to reduce inflation is to break this 8-and-6 combination by slowing the underlying rate.

Recent state and local government wage increases are not keeping pace with private sector pay increases (*Table 6*). From 1970 to 1973 state and local government wage increases were greater than private sector pay increases. However, from 1974 to 1976 the private sector has had more rapid percentage increases in wages than has the state and local government sector. Thus, at least at present, state and local government wage increases are not a major inflationary force.

State and Local Governments and Inflation: The Long Run

Although state and local government financial behavior is not at present a major inflationary force, some economists suggest that, in the long run, state and local government activity will become a major inflationary factor. They point out that the economy is divided into two sectors—a technologically

Table 6

AVERAGE ANNUAL EARNINGS AND PERCENT INCREASE IN EARNINGS PER FULL-TIME EMPLOYEE 1969-76

Average Annual Earnings per Full-Time Employee

	1969	1970	1971	1972	1973	1974	1975	1976
Private Domestic Industries	$7,215	$ 7,649	$ 8,108	$ 8,588	$ 9,105	$ 9,830	$10,687	$11,483
Federal General Civilian Government	9,724	10,975	11,831	12,679	13,497	14,112	15,195	16,201
State-Local General Government	7,207	7,790	8,373	8,899	9,481	10,029	10,836	11,523
Public Education	7,529	8,140	8,695	9,260	9,763	10,215	11,128	11,885
Non-School	6,847	7,400	8,012	8,501	9,170	9,822	10,517	11,126

Percent Increase in Earnings per Full-Time Employee

Private Domestic Industries	6.0%	6.0%	5.9%	6.0%	8.0%	8.7%	7.4%
Federal General Civilian Government	12.9	7.8	7.2	6.4	4.6	7.7	6.6
State-Local General Government	8.1	7.5	6.3	6.5	5.8	8.0	6.3
Public Education	8.1	6.8	6.5	5.4	4.6	8.9	6.8
Non-School	8.1	8.3	6.1	7.9	7.1	7.1	5.8

SOURCE: ACIR staff compilation based on U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business,* various years.

progressive sector and a service sector, of which state and local governments are a part. In the technologically progressive sector as the economy grows, productivity and wages and salaries will increase. In the service sector productivity will not increase. However, wages and salaries will rise to keep pace with the increases in the technologically progressive sector and resources will move into the service sector. This long-run trend will lead to increased prices and an increase in the rate of inflation.[8]

Under this reasoning state and local governments could become a major inflationary force. The solution to the problem, however, can not be found in fiscal coordination efforts, but in improving state and local government productivity.

CONCLUSIONS

Based on the empirical evidence presented in this section, five general conclusions can be drawn:

1. **While state and local governments are still a major growth industry, during the 1970s the rate of their own source expenditure growth relative to that of the national economy has substantially slowed. Federal aid to state and local governments is now a major factor in maintaining their relative growth position.**

2. **Historically, the flow of federal aid funds to state and local governments has grown. There is no apparent consistent**

relationship between the rate of that growth and the health of the national economy.

3. In recent years direct federal aid to state and local governments has grown at a faster clip than own source state and local revenue has increased. This is particularly true for local governments.

4. During each economic downswing since World War II, state and local fiscal behavior was countercyclical because it added to aggregate demand. This judgment holds whether we use the "traditional" yardstick—the national business cycle—or the newer and more "activistic" measure—potential full employment. However, during the present economic upswing the contribution of state and local fiscal behavior is negligible. State and local governments are increasing their expenditures, but at a slower rate than they did during previous recoveries.

5. State and local fiscal behavior has not been a major driving force in increasing the present rate of inflation.

The Effects of the Business Cycle on State and Local Government Fiscal Behavior

One justification for enacting the economic stimulus program was that fluctuations in economic activity—particularly recessions —tend to have adverse impacts on state and local governments' ability to deliver public services. As a result of recession they are forced to reduce public employment and cut back on "needed" services. Antirecession aid is therefore necessary to insulate these units from the hardships imposed by aggregate economic fluctuations over which the individual governments have no control.

Evaluating this justification requires measuring the impact of economic fluctuations on state and local government revenue and expenditure systems. Two separate but related influences must be examined: the effect of recession on state and local government revenue and expenditure systems and the effect of inflation on state and local revenue and expenditure systems.

Ideally, these relationships can be distinguished and measured. For example, to the extent that a state or local government's revenue system is sensitive to changes in the level of income, a recession will reduce revenue collections; and inflation will increase those collections. However, studies of the effects of aggregate economic fluctuation on expenditures have yielded mixed results to such an extent that even the direction of these impacts is unclear.

In a textbook world uncomplicated by continuous changes, these effects would be difficult to sort out. In the real world of state and local government finances, the difficulties multiply. During the years 1973-75 the economy experienced simultaneous inflation and recession and state and local government budgets were forced to respond to both influences at the same time. The timing of aggregate economic changes and the inevitable lags between economic changes and the time that they show up in revenue collections and expenditures increase the analytical difficulties involved.

In addition, the studies which have attempted to estimate the impact of economic changes on state and local government finances have tended to be one-sided. The revenue loss to state and local governments resulting from recession has received a great deal of attention. Recession related impacts on expenditures have received very little attention. Cost increases due to inflation have been widely discussed while little attention has been paid to the increases in revenues that come from the same inflation.

THE IMPACT OF RECESSION ON STATE AND LOCAL FINANCIAL SYSTEMS

Recession may affect both revenues and expenditures of state and local governments. It is initially useful however, to analyze these impacts separately.

Effects of Recession Upon Revenues

Three approaches have been used to estimate dollar revenue losses caused by a given recession. State and local officials have been surveyed and asked how much their budgets were hurt by the recession. Researchers have analyzed the income elasticity of revenue collections to determine the percentage loss in revenue due to a reduction in income. Finally the difference between what would have been collected at a full employment level of income and actual revenue collections has been estimated. While each of these methods has merit, each provides a different estimate of revenue loss.

THE SURVEY METHOD: PUBLIC OFFICIALS' ESTIMATES OF THE EFFECTS OF RECESSION ON STATE AND LOCAL GOVERNMENT REVENUES

The severity of the 1973-75 recession generated a series of surveys which attempted to determine the impact of this economic downturn on state and local government financial systems. The surveys range from the horror story approach—single examples of severely distressed areas from which few generalizations can be drawn—to reasonably scientific samples yielding general, impressionistic views of the difficulties imposed on state and local governments by the recession.

During the early summer of 1975 the Senate Subcommittee on Intergovernmental Relations of the Committee on Governmental Affairs held hearings on ways in which the federal government could provide antirecession aid to hard-pressed state and local governments.[9] The testimony given during those hearings did not provide exact estimates of revenue loss due to the recession, but it did portray the current financial conditions of some of the more hard-pressed places. The testimony implied that the recession worsened the already deteriorating fiscal condition of some state and local governments.

For example, John Malarkey, secretary of finance of Delaware, reported that corporate income tax collections for fiscal year 1975 were down by 33% as compared to fiscal year 1974. State revenues were growing at a rate of only 7% per year as compared to 19% in preceding years, and in his opinion Delaware had not yet felt the full impact of the recession.[10]

Philip Merrill, state senator from Portland, ME, testified that the recession caused the Governor of Maine to "draft a budget which would reduce or completely cut out the following state programs: law enforcement programs, day care, adult education, vocational education, homemaker services, meals for the elderly, and catastrophic illnesses."[11]

At the local level, conditions were reported to be equally severe. Henry Maier, Mayor of Milwaukee, speaking on behalf of the Mayors, told the subcommittee that the recession had cost New York City $150 million in revenues in six months. It had forced the City of Detroit to announce the layoff of as many as 25% of the city's employees and it had been a factor in precipitating two property tax increases in the past year in the city of Newark.[12]

When considering the extension of the Antirecession Fiscal Assistance Program in March 1977, the Intergovernmental Relations and Human Resources Subcommittee of the House Committee on Government Operations also took testimony from state and local government officials concerning the impact of the recession on their budgets.[13] They also found examples of places which had been severely hurt by the recession. Edward G. Hofgesang, budget director for the State of New Jersey, blamed the recession, combined with the inflation, for a reduction in New Jersey State appropriations during fiscal year 1976 of 3% below fiscal year 1975 levels, as well as for $210 million in newly enacted taxes.[14]

In a staff paper for the Brookings Institution, David T. Stanley provides a more systematic examination of the fiscal distress of five major cities.[15] Stanley visited Detroit, St. Louis, Buffalo, Cleveland, and New York in the summer and fall of 1975 and found them to be "crunched between high costs and slumping economies . . . aggravated (some analysts say caused) by inflation and recession."[16] For instance, for the fiscal year beginning July 1, 1975, Detroit faced an estimated budget deficit of $100 million in a budget of only about $600 million.[17] St. Louis faced a deficit of about $21 million in a budget of $180 million for

fiscal year 1975-76 after having begun the previous year with a deficit of $5.4 million.[18] Cleveland faced a deficit of $15 million and Buffalo needed an increase of 9.1% in its revenues simply to stay even. New York was in a class by itself with an estimated deficit in the range of $200-$300 million.

While Stanley's study does provide a systematic analysis of these five cities' financial problems, it does not tie those problems directly to the recession. General economic trends such as declining population and loss of economic base as well as higher service costs due to inflation are given greatest weight in explaining the deteriorating financial situations.

The *Comprehensive Employment and Training Act* (CETA) was given credit for substantially reducing the number of layoffs that otherwise would have taken place in these financially hard-pressed cities. Detroit, Cleveland, and New York all used CETA funds to rehire employees whose jobs probably otherwise would have been terminated. For example, while Detroit cut a total of 3,336 employees off its own payroll, it added 2,328 employees paid by CETA, leading one member of the mayor's staff to comment that without CETA we'd be out of business."[19]

In March 1975 two articles concerning the effect of recession on state and local finances appeared in *Public Management*. Neither article made any attempt to quantify the actual dollar impacts of the recession, but the authors of both pieces stressed the difficulties that the recession imposed on central cities. Roy W. Bahl argued that "the current pattern of inflation/recession will affect local governments, particularly core city governments, far more adversely than it will affect state governments."[20] Bahl's assertion rests upon the differential impact of both recession and inflation on the major tax sources and expenditure requirements of state *versus* local governments.

Based on a telephone survey of selected city and county governments, Wayne F. Anderson and John Shannon supported Bahl's position pointing out that the "nation's major central cities—particularly those located in the east and midwest—are especially vulnerable to economic recession. To put it another way, when the nation comes down with a heavy economic cold, these jurisdictions are the first to develop pneumonia."[21]

Some more general surveys were also conducted during this period. The most widely quoted of these surveys attempted to directly link the recession to state and local government's financial distress. It was done for the Subcommittee on Urban Affairs by the staff of the Joint Economic Committee.[22] This survey, covering 48 states and 140 local governments, drew two general conclusions. First, the recession had caused state and local governments to increase taxes, reduce expenditures, and delay or cancel capital construction projects. The survey found that 20 states either adopted or planned to adopt tax increases totaling $2.1 billion; 22 states had to cut services for a total expenditure reduction of $1.9 billion; and while the survey could only establish that 25 states were either delaying or canceling capital projects which they could quantify as totaling $160 million of construction projects, the study estimated that as much as $400 million of such projects would actually be affected by the end of fiscal year 1976.[23] Thus the estimated deflationary adjustments of state governments amounted to $4.4 billion or about 3.8% of 1974-75 own source revenues.

Based on the responses of 140 local governments, the survey found that local governments planned tax increases amounting to $1.5 billion, expenditure reductions of $1.4 billion,[24] and 71 of the local governments surveyed expected delays or cancellations of capital projects (dollar figures on cutbacks were not available). The estimated budget adjustment resulting from the recession amounted to as much as $3.5 billion or about 3.6% of local government own source general revenues.[25]

According to this survey, total state-local deflationary adjustments—either planned or actual—removed between $7.5 and $8 billion from the economy.[26] These adjustments amounted to between 3.5% and 3.7% of own source general revenues.

The second major finding of this survey was that jurisdictions with the highest unemployment rates were forced to make the most severe budgetary adjustments. For ex-

Table 7

BUDGET ADJUSTMENTS BY STATE GOVERNMENTS (A SAMPLE OF 48 STATES)

(dollar amounts in millions)

Unemployment Rate (March 1975)	Number of States	Tax Increases	Expenditure Cutbacks	Total Budget Adjustments
5- 7	9	$ 50	$ 0	$ 50
7- 8	7	70	120	190
8- 9	8	54	185	239
9-10	7	720	325	1,045
10-11	9	635	650	1,285
11+	8	600	645	1,245
Total	48	2,129	1,925	4,054

SOURCE: U.S. Congress, Joint Economic Committee, Subcommittee on Urban Affairs, *The Current Fiscal Position of State and Local Governments,* Joint Committee Print, 94th Congress, 1st Sess., Washington, DC, U.S. Government Printing Office, December 17, 1975, p. 6.

Table 8

BUDGET ADJUSTMENTS BY LOCAL GOVERNMENTS (A SAMPLE OF 106 JURISDICTIONS)

(dollar amounts in millions)

Unemployment Rate (March 1975)	Number of Local Governments	Tax Increases	Expenditure Cutbacks	Total Budget Adjustments
4- 6	13	$ 4.0	$ 5.2	$ 9.2
6- 7	12	14.6	2.1	16.7
7- 8	14	16.6	5.1	21.7
8- 9	12	3.3	15.8	19.1
9-10	8	18.9	3.3	22.1
10-11	17	26.8	63.2	90.0
11-12[1]	9	66.2	16.4	82.6
12-14	14	36.6	32.8	69.4
14+	7	16.5	75.5	92.0

[1]New York would fit into this group, but has been excluded from the table due to its unique financial situation.

SOURCE: U.S. Congress, Joint Economic Committee, Subcommittee on Urban Affairs, *The Current Fiscal Position of State and Local Governments,* Joint Committee Print, 94th Congress, 1st Sess., Washington, DC, U.S. Government Printing Office, December 17, 1975, p. 14.

ample, the 17 states with unemployment rates of 10% or more, made over 62% of the total budget adjustments (*Table 7*). For local governments, the relationship between high unemployment and large budget adjustments is not as clear as it is for states. It appears, however, that those jurisdictions with unemployment in excess of 10% were forced to make the most severe budgetary cutbacks (*Table 8*).

The Joint Economic Committee's survey provides a more complete picture of the financial impact of the recession on state and local government budgets than the individual case studies. Yet, there are three general problems with the survey that make interpretation of the results difficult. First, these results include both actual and anticipated budgetary adjustments. There is no way to determine the extent to which the anticipated adjustments were actually carried out or to decide the year in which these anticipated changes actually took place. Second, since the best interests of state and local officials would dictate putting their worst financial foot forward, the survey may overstate the extent of the necessary adjustments. Finally, because the study was undertaken before the full effects of the recession were known, it would have been very difficult for these officials to separate budget adjustments taken in response to cyclical changes from those caused by long-run structural changes.

Four other recent surveys help to explain the fiscal conditions of state and local governments. The National Association of State Budget Officers in collaboration with the National Governors' Conference (now the National Governors' Association) periodically publishes a survey of state fiscal conditions. Their survey of 31 states for fiscal 1977 concluded that "state governments are operating on a fiscal tight-rope."[27] The slow growth levels for both general revenues and general expenditures "suggest austere conditions in state finances . . . and indicate that state officials are striving to maintain operations within existing sources and levels of available revenue."[28] In fiscal year 1977 estimated state expenditures were expected to grow by only 9% while estimated revenues were expected to increase by 8% (*Table 9*). At the same time, state general fund balances were expected to fall by 25% from their 1976 levels[29] (*Table 10*).

The Joint Economic Committee also periodically publishes surveys of the financial conditions of state and local governments. Most recently it surveyed 67 of the 75 largest cities for fiscal year 1977 and came to the following conclusions:

- Capital expenditures were significantly reduced between fiscal year 76 and fiscal year 77 while at the same time capital needs remain extensive.

- Service expenditures increased by 5% between fiscal year 76 and fiscal year 77. At the same time inflation increased by 6%.

Table 9

GENERAL FUND REVENUE AND EXPENDITURE SUMMARY (31 STATES) FISCAL YEARS 1975-77

(dollars in billions)

	FY 1975	FY 1976	FY 1977 Est.
Revenues	$44.1	$49.4	$54.1
Percent Increase		12%	9%
Expenditures	$44.8	$50.4	$54.4
Percent Increase		12.5%	8%
Difference (Revenues-Expenditures)	$-.7	$-1.0	$-.3

SOURCE: National Association of State Budget Officers, *State Fiscal Survey*, Fiscal Years 1975, 1976 and 1977, Summary Report, February 1977, p. 2.

Table 10

CHANGES IN GENERAL FUND BALANCES (31 STATES)
FISCAL YEARS 1975-77
(dollars in billions)

Fiscal Period	FY 1975	FY 1976	FY 1977 Est.
Ending Balance	$3.3	$3.2	$2.4
Percent Change		-3%	-25%
Percent of General Fund Expenditures	7%	6%	4%

SOURCE: National Association of State Budget Officers, *State Fiscal Survey,* Fiscal Years 1975, 1976 and 1977, Summary Report, February 1977, p. 3.

- Municipal employment remained relatively constant between these two years.
- Unencumbered surpluses for 60 of the cities surveyed declined by 23%.[30]
- Tax rates were increased but at a very slow pace.[31]

The survey found that the maintenance and upgrading of the public sector infrastructure was the most important single problem facing these 65 cities and that cities with both high unemployment rates and declining populations exhibited the greatest symptoms of "need."[32]

While these two surveys do provide a descriptive picture of the fiscal strain that these state and local governments were experiencing, they do not directly connect this strain with the behavior of the national economy. The third survey, done by the Senate Subcommittee on Intergovernmental Relations, attempted to make just that connection.[33] The subcommittee surveyed state and local governments, receiving responses from about 400, and found that over 75% of all local jurisdictions responding had to make some recession-related budget adjustments over the two-year period. Ninety-six percent of those with unemployment rates over 8% made restrictive adjustments. The budget adjustments were as follows: (1) one-third increased taxes; (2) 58% imposed some form of limitation on personnel; and (3) 20% delayed or canceled capital projects.[34] Interestingly, only 13 of the 28 states responding to the survey reported having to make recession-related budgetary adjustments.[35]

Unfortunately this survey does not provide any indication of the size of those adjustments. Limitations on personnel and tax increases are given equal weight when counting a recession-related adjustment. This type of tabulation makes it extremely difficult to quantify the impact of the recession on state and local budgets.

The fourth survey reviewed here was done by the Office of the Comptroller General of the United States as a part of its evaluation of antirecession assistance.[36] This one covered 52 units of government including 15 states, 16 counties, and 21 cities. Three important conclusions with respect to the impact of the recession on state and local finances were reached:

1. The recession did have some impact on state and local governments' financial condition. Some governments lost revenues. However, other factors such as unfavorable demographic changes were probably more important in determining financial conditions, and many governments receiving antirecession payments were not substantially affected by the recession.
2. The impact of the recession varied by type of jurisdiction. Cities appeared to be the most adversely affected. States were second and counties retained their relatively good financial conditions from 1974 to 1976.
3. The vast majority of governmental officials attributed their fiscal difficulties to

the pressures of inflation rather than recession.

While the results of the four surveys are not specific and the validity of the responses may in some cases be questioned, they do provide a general impression of the impact of the 1973-75 recession on state and local government finances. The responses lead to three general conclusions. First, all the results agree with the observation that the recession did, at least to some extent, weaken the fiscal position of state and local governments. Second, the degree of the worsened financial condition is associated with the level of unemployment. And third, inflation as well as recession is important in determining the fiscal condition of these governments.

DETERMINING REVENUE LOSS BY ESTIMATING THE INCOME ELASTICITY OF STATE AND LOCAL REVENUE SYSTEMS

The revenue loss due to a recession also can be analyzed by reference to the income elasticity of the various state and local government taxes. The income elasticity of state-local taxes shows how much tax collections will change in response to a change in income. For example, if the income elasticity of the state personal income tax was estimated to be 1.7, then for every 1% increase in personal income, state personal income tax collections would increase by 1.7%.

Table 11 provides estimates of the income elasticity of major state and local government taxes. For each tax studied, a range of elasticity estimates is available. That range is the result of differences in the estimating method used by the various investigators, in time periods covered, and in the places studied.

These estimates can be used to determine the range of the revenue loss to state and local government induced by the recession. For example, if we take the middle income elasticity estimate for the United States for each of the major tax sources and apply that estimate to the difference between actual and potential GNP in fiscal year 1975, that calculation would yield the following estimates of tax revenue loss due to the recession:[37]

Source	Elasticity	Loss (in billions)
Personal Income Tax	1.7	$ 3.422
Corporate Income Tax	1.1	0.685
General Property Tax	0.98	4.735
General Sales Tax	1.0	4.674
Total Loss		**$13.516**

This hypothetical loss amounts to 10.5% of actual state-local tax collections or 6.3% of state-local revenues from own sources in fiscal year 1975.

While this method of calculating the loss is crude, it has been previously used to estimate the impact of a recession on state and local revenues. In their discussion of revenue-stabilizing grants, David Greytak and A. Dale Tussing suggested that the amount of such a grant should be proportional to the revenue loss as calculated by income elasticity estimates.[38] They found that for the period 1949-62 cumulative revenue losses per recession ranged between $3 billion and $6 billion.[39]

More recently as a part of their evaluation of antirecession assistance, the General Accounting Office used income elasticity to estimate recession-induced losses to state government revenues.[40] *Table 12* summarizes their estimates. It should be noted that in each case their elasticity estimates are lower than those of published studies summarized in *Table 11*. As a consequence, estimates of revenue loss based on these elasticities will also be lower.

The GAO study then simulated a recession and applied these elasticities to the simulated income losses obtaining estimates of state-by-state revenue losses which could be attributed to a recession.

Since these estimates are based on a simulation of a relatively moderate recession, the results cannot be compared with other estimates of revenue loss based on the relatively severe 1973-75 recession experience. Nonetheless each state's relative proportion of the total revenue loss is of interest. *Table 13* presents,

Table 11

RANGE OF ESTIMATED INCOME ELASTICITIES OF MAJOR STATE AND LOCAL TAXES

Investigator (Year)	Area	Elasticity
Personal Income Tax		
Harris (1966)	Arkansas	2.40
ACIR (1971)	Kentucky	1.94
ACIR (1971)	New York	1.80
Harris (1966)	United States	1.80
Groves and Kahn (1952)	United States	1.75
Netzer (1961)	United States	1.70
ACIR (1971)	Hawaii	1.47
Planning Division (1971)	Arizona	1.30
Harris (1966)	New Mexico	1.30
General Sales Tax		
Davies (1962)	Arkansas	1.27
Rafuse (1965)	United States	1.27
ACIR (1971)	Maryland	1.08
Peck (1969)	Indiana	1.04
Netzer (1961)	United States	1.00
Harris (1966)	United States	1.00
Davies (1962)	United States	1.00
ACIR (1971)	Kentucky	0.92
Planning Division (1971)	Arizona	0.87
Davies (1962)	Tennessee	0.80
Motor Fuels Tax		
ACIR (1971)	Maryland	0.80
Peck (1969)	Indiana	0.77
ACIR (1971)	Kentucky	0.75
Planning Division (1971)	Arizona	0.74
ACIR (1971)	New Jersey	0.74
ACIR (1971)	Oregon	0.70
ACIR (1971)	New York	0.69
Harris (1966)	United States	0.60
ACIR (1971)	Hawaii	0.48
Rafuse (1965)	United States	0.43
General Property Tax		
ACIR (1971)	New York City, NY	1.41
Mushkin (1965)	United States	1.30
ACIR (1971)	Baltimore City, MD	1.25
Netzer (1961)	United States	1.00
Bridges (1964)	United States	0.98
ACIR (1971)	Honolulu Co., HI	0.89
ACIR (1971)	Multnomah Co., OR	0.84
McLoone (1961)	United States	0.80
Rafuse (1965)	United States	0.80
ACIR (1971)	Jefferson Co., KY	0.50
ACIR (1971)	Newark, NJ	0.38
ACIR (1971)	Albany City, NY	0.34
Corporate Income Tax		
Peck (1969)	Indiana	1.44
ACIR (1971)	Kentucky	1.19
Harris (1966)	United States	1.16
ACIR (1971)	New York	1.13
Netzer (1961)	United States	1.10
ACIR (1971)	Hawaii	0.98
Planning Division (1971)	Arizona	0.97
ACIR (1971)	Oregon	0.93
ACIR (1971)	New Jersey	0.72
Tobacco Tax		
ACIR (1971)	Kentucky	0.54
Harris (1966)	United States	0.40
ACIR (1971)	New Jersey	0.36
ACIR (1971)	Hawaii	0.30
Planning Division (1971)	Arizona	0.21
ACIR (1971)	New York	0.12
ACIR (1971)	Maryland	0.00
ACIR (1971)	Oregon	0.00

SOURCES: Advisory Commission on Intergovernmental Relations, "State-Local Revenue Systems and Educational Finance," unpublished report to the President's Commission on School Finance, November 12, 1971; Arizona, Department of Economic Planning and Development, Planning Division, *Arizona Intergovernmental Structure: A Financial View to 1980,* Phoenix, 1971; Benjamin Bridges, Jr., "The Elasticity of the Property Tax Base: Some Cross Section Estimates," *Land Economics,* 40: 449-51, November 1964; David G. Davies, "The Sensitivity of Consumption Taxes to Fluctuations in Income," *National Tax Journal,* 15: 281-90, September 1962; Harold M. Groves, and C. Harry Kahn, "The Stability of State and Local Tax Yields," *American Economic Review,* 42: 87-102, March 1952; Robert Harris, *Income and Sales Taxes: The 1970 Outlook for States and Localities,* Chicago, Council of State Governments, 1966; Eugene P. McLoone, "Effects of Tax Elasticities on the Financial Support of Education," unpublished Ph.D. dissertation, College of Education, University of Illinois, 1961; Selma Mushkin, *Property Taxes: The 1970 Outlook,* Chicago, Council of State Governments, 1965; Dick Netzer, "Financial Needs and Resources Over the Next Decade," in *Public Finances: Needs, Sources, and Utilization,* Princeton, Princeton University Press, 1961; John E. Peck, "Financing State Expenditures in a Prospering Economy," *Indiana Business Review,* 44: 7-15, July 1969; Robert W. Rafuse, "Cyclical Behavior of State-Local Finances," in Richard A. Musgrave (ed.), *Essays in Fiscal Federalism,* Washington, Brookings Institution, 1965.

on a state-by-state basis, relative losses as calculated by the simulation method and compares these estimates to the relative amounts of antirecession assistance disbursed to each state. There appears to be a relatively high correlation between the proportion of the total loss attributed to each state and the proportion of antirecession assistance going to that state.

Three major problems arise when income elasticities are used to estimate revenue losses due to a recession. First, elasticity estimates are not available for all revenue sources and therefore a number of sources—frequently fees and charges—are left out. As a result, those states with relatively greater revenue reliance on fees and charges would have less of their revenue base taken into account than those states heavily dependent on the state income tax. Second, elasticity estimates are imprecise because definitions of tax type are not uniform across states, because administrative effort varies, and because elasticities may vary for other reasons from year to year. Hence elasticity estimates for any given type of tax tend to vary over a fairly large range. Third, a number of experts have argued that these estimates really represent average long-run responses of tax revenues to changes in income. Therefore, they are of minimal value in analyzing short-run revenue fluctuations related to the business cycle.[41]

COMPUTING RECESSION-INDUCED REVENUE LOSSES BY COMPARING ACTUAL TO FULL EMPLOYMENT REVENUES

Under the third approach to estimating state and local government revenue loss the task is to directly relate changes in the business cycle to changes in revenue collections. Since 1974 the Council of Economic Advisers has included as a part of its annual report an estimate of full employment state and local government receipts. The difference between these estimated full employment receipts and actual state and local government receipts can be used as an estimate of the relative magnitude of loss due to the recession.

In order to calculate full employment state and local government receipts, the first step is to estimate the full employment tax base for the major categories of state and local revenue. For indirect business taxes, including both sales and property tax revenues, full employment GNP in nominal terms is used as the best available proxy for the full employment tax base. For corporate profits tax receipts, full employment corporate profits before taxes are used as the tax base. And, for state and local personal taxes, taxable personal income at full employment is considered the appropriate full employment tax base.

Table 12

GAO ESTIMATES OF STATE TAX ELASTICITIES

Kind of Elasticity	Tax	Elasticity
Income Elasticity	State Individual Income Tax	1.13
Income Elasticity	State General Sales and Selective Sales Taxes	0.73
Profit Elasticity	State Corporate Profits Tax	0.76

SOURCE: Comptroller General of the United States, *Anti-recession Assistance—An Evaluation*, p. 100.

Two other sources of state and local income are considered: federal grants and contributions to social insurance. Federal grants do not appear to vary with the size of the GNP gap and are taken as given. Thus, actual federal grants are used to proxy for full employment federal grants. Similarly, actual contributions for social insurance to state and local governments take the place of full employment contributions. The contention is that these receipts depend upon state and local wages and salaries. These wages and salaries do not appear to vary significantly with the size of the GNP gap. Therefore actual receipts from this source are taken as a good proxy for what receipts would have been had the economy operated at full employment.[42]

The next step in this estimating process is to apply the average state and local tax rates for the indirect business taxes, the corporate profit tax, and the personal income tax to the estimated full employment tax base for each of these taxes. The result is an estimate of revenues state and local government would have received had the economy been operating at full employment.

Table 13

PROPORTIONAL REVENUE LOSSES FROM GAO SIMULATED RECESSION AND ANTIRECESSION FISCAL ASSISTANCE, BY STATE

	Revenue Loss—GAO Simulated Recession		
States	Millions	Proportion of Total Loss	Percentage of Total ARFA Disbursed Through the Sixth Quarter[1]
U.S., Total	$2,531.4	100.00	100.00
Alabama	29.5	1.16	1.09
Alaska	7.8	0.31	0.42
Arizona	18.4	0.73	1.26
Arkansas	16.5	0.65	0.78
California	351.2	13.87	13.14
Colorado	32.8	1.30	0.78
Connecticut	43.8	1.73	2.09
Delaware	6.7	0.26	0.50
Dist. of Columbia	—	—	0.55
Florida	69.0	2.73	4.89
Georgia	58.0	2.29	2.10
Hawaii	22.1	0.87	0.62
Idaho	5.9	0.23	0.46
Illinois	118.0	4.66	3.68
Indiana	59.3	2.34	1.59
Iowa	25.2	0.99	0.53
Kansas	21.1	0.83	0.48
Kentucky	40.9	1.62	0.98
Louisiana	30.3	1.20	1.30
Maine	8.8	0.35	0.70
Maryland	60.6	2.39	1.37
Massachusetts	105.0	4.15	3.70
Michigan	134.0	5.29	6.12
Minnesota	73.5	2.90	1.19
Mississippi	25.6	1.01	0.76

[1]The sixth ARFA quarter ended December 31, 1978.

SOURCE: *GAO Report* and ACIR staff calculations.

Table 13 (Cont.)

PROPORTIONAL REVENUE LOSSES FROM GAO SIMULATED RECESSION AND ANTIRECESSION FISCAL ASSISTANCE, BY STATE

States	Revenue Loss—GAO Simulated Recession		Percentage of Total ARFA Disbursed Through the Sixth Quarter[1]
	Millions	Proportion of Total Loss	
Missouri	48.3	1.91	1.28
Montana	3.9	0.15	0.48
Nebraska	12.1	0.48	0.42
Nevada	6.7	0.26	0.52
New Hampshire	5.4	0.21	0.47
New Jersey	62.7	2.48	5.30
New Mexico	6.5	0.26	0.66
New York	309.4	12.22	12.74
North Carolina	62.8	2.48	1.63
North Dakota	—	—	0.38
Ohio	112.0	4.42	4.58
Oklahoma	22.7	0.90	0.76
Oregon	23.5	0.93	1.57
Pennsylvania	144.6	5.71	5.40
Rhode Island	11.3	0.45	0.69
South Carolina	32.4	1.28	0.98
South Dakota	1.3	0.05	0.33
Tennessee	35.1	1.39	1.17
Texas	62.0	2.45	2.83
Utah	16.2	0.64	0.52
Vermont	6.1	0.24	0.47
Virginia	58.0	2.29	1.30
Washington	32.5	1.28	1.98
West Virginia	14.6	0.58	0.76
Wisconsin	73.3	2.90	1.34
Wyoming	4.0	0.16	0.33

Two important assumptions underlying this method need to be made explicit. First, state and local government tax rates are assumed to be the same at full employment as they actually were. In other words, state and local tax rates do not vary systematically with the size of the GNP gap. As the gap increases tax rates do not also increase. Second, expenditures are assumed to be determined exogenously and not affected by changes in the business cycle. Therefore actual expenditures are assumed to be equal to full employment expenditures.

Table 14 shows the Council of Economic Advisers' calendar year estimates of state and local governments' actual and estimated full employment receipts. If the differences between full employment and actual receipts are taken as estimates of the magnitude of revenue loss due to the recession, then the losses to state and local governments were $9.1 billion, $21.3 billion, and $17.2 billion in calendar years 1974, 1975, and 1976, respectively. Taken as a percentage of actual receipts, the losses due to the recession amounted to 4.3% of actual receipts in 1974, 9.1% in 1975, and 6.6% in 1976.

The council's method of estimating full employment state and local government receipts has been criticized by Robert Vogel as overestimating full employment receipts.[43] Vogel argues that rather than being constant, as this method assumes, state and local tax rates vary systematically with the size of the GNP gap. As that gap increases, state and local governments tend to raise tax rates to maintain a fairly constant level of receipts. Using actual rates to estimate full employment tax receipts will overestimate true full employment receipts when the gap is large.

Vogel's multiple regression analysis implies that for every 1% decline in the GNP gap ratio (actual GNP divided by potential GNP) state and local total receipts will fall by 0.377%.[44] For example, for calendar year 1971, the most recent recession year estimated by Vogel, state and local losses due to the recession amounted to $3 billion. Using similar data, by the council's method the loss for the same year was estimated at $7.1 billion.[45]

Vogel's period of observation ends with calendar year 1973. Since that time the Council of Economic Advisers has recomputed full employment GNP and, as a result, Vogel's estimate of the coefficient for the GNP gap may no longer be applicable.

Using a regression model similar to Vogel's, but in "first differences" form, we estimated that revenue losses to state and local governments due to the recession in fiscal year 1975 amounted to $15.3 billion or 8.4% of own source state and local revenues.[46] When the same regression analysis was performed on a state-by-state basis, the estimated losses for fiscal year 1975 ranged from more than 20% of own source general revenues to less than 5% of own source general revenues.[47] The countercyclical programs were found to be highly targeted to those states with the greatest revenue losses due to the recession. The simple correlation between aid and estimated loss was .91. Antirecession Fiscal Assistance was the most highly targeted of the countercyclical programs with a simple correlation of .92 with estimated loss, as compared to Local Public Works at .90 and CETA at .89.[48] (For the details of these estimates, see *Appendix C.*)

THE IMPACT OF THE BUSINESS CYCLE ON EXPENDITURES

Recession also influences state and local government expenditures, but the effect is more difficult to estimate, and even its direction is in question. In the short run, recession may cause some expenditures to increase. For example, state and local government expenditures for welfare and unemployment compensation are directly tied to factors affected by the recession. Again, using a simulation model, GAO estimated that a recession would cause an increase in certain state expenditures equal to about 7% of the state revenue loss caused by the recession.[49]

Following a recession, total state and local government expenditures may be expected to grow slowly or even fall somewhat. Besides the automatic expenditures mentioned above, which should decline during the recovery period, there may be considerable pressure for state and local governments to reduce deficits and restore their pre-recession surplus levels by slowing down expenditure growth. In addition, taxpayer demand for government services may decline somewhat as a result of reduced wealth and income associated with

Table 14

ACTUAL AND FULL-EMPLOYMENT FEDERAL, STATE, AND LOCAL GOVERNMENT RECEIPTS AND EXPENDITURES, NATIONAL INCOME AND PRODUCT ACCOUNTS BASIS, CALENDAR YEARS 1970-76

(billions of dollars; quarterly data at seasonally adjusted annual rates)

	Federal Government				State and Local Government			
Calendar Year	Receipts	Expenditures	Surplus or deficit (—) Amount	Surplus or deficit (—) Change	Receipts	Expenditures	Surplus or deficit (—)	Operating surplus or deficit (—)[1]
Actual:								
1970	192.1	204.2	—12.1	—20.6	134.9	132.2	2.8	—4.0
1971	198.6	220.6	—22.0	—9.9	152.6	148.9	3.7	—3.8
1972	227.5	244.7	—17.3	4.7	177.4	163.7	13.7	5.6
1973	258.3	265.0	—6.7	10.6	193.5	180.5	13.0	4.1
1974	288.2	299.7	—11.5	—4.8	210.2	203.0	7.3	—2.8
1975	286.5	357.8	—71.2	—59.7	234.3	227.5	6.9	—5.1
1976[2]	330.6	383.9	—58.3	12.9	260.5	246.6	13.9	.8
1976: I	316.5	380.3	—63.8	5.6	251.6	239.5	12.2	—.6
II	324.6	378.7	—54.1	9.7	254.3	245.0	9.2	—3.8
III	333.8	391.1	—57.4	—3.3	262.0	249.3	12.7	—.6
Full Employment:								
1970	201.0	203.6	—2.6	—6.3	138.1	132.2	6.0	—
1971	210.0	219.1	—9.2	—6.6	157.3	148.9	8.3	—
1972	222.1	243.6	—21.5	—12.3	179.4	163.7	15.7	—
1973	257.5	265.4	—7.9	13.6	192.9	180.5	12.4	—
1974	311.8	297.7	14.1	22.0	219.3	203.0	16.4	—
1975	337.6	350.1	—12.5	—26.5	255.6	227.5	28.1	—
1976[2]	371.6	381.9	—10.3	2.2	277.7	246.6	31.2	—
1976: I	358.5	372.6	—14.1	.6	269.2	239.5	29.7	—
II	365.3	371.9	—6.7	7.4	271.7	245.0	26.7	—
III	376.1	384.3	—8.2	—1.5	279.7	249.3	30.4	—

[1]Surplus or deficit, excluding social insurance funds.
[2]Preliminary.
Note: Detail may not add to totals because of rounding.

SOURCE: *Economic Report of the President,* Council of Economic Advisers, transmitted to Congress January 1977, Washington, DC, U.S. Government Printing Office, 1977, p. 76.

recession. Since it takes time for a government to reduce planned expenditures, a lag between the change in the GNP gap and the hypothesized expenditure reduction is expected.

The hypothesis, then, is that state and local government expenditure growth will be higher than normal during recession, followed by slower than normal expenditure growth during recovery periods, other things being equal. In support of this hypothesis, expenditure growth was found to be higher during contraction than during the following expansion period for three of the last four business cycles, as shown in *Table 3*. The exception was the nine-year expansion from 1960 to 1969, in which a short recovery period is dominated by the subsequent, relatively long period of steady and rapid growth.

Another test of this hypothesis involves the use of time series, multiple regression

analysis. Our results indicate that for a $1 billion increase in the GNP gap (the hypothetical difference between potential and actual GNP) state and local government expenditures in the aggregate will increase by an estimated $60 million in that year. In the next year state and local government expenditures will fall by $80 million. Over the two-year period, state and local government expenditures would fall by an estimated $20 million as a result of a $1 billion increase in the GNP gap,[5th] other things being equal. Hence, recession appears to result in a small initial increase in state and local government expenditures followed by a short period of expenditure reduction of a slightly larger magnitude than the initial increase. When both changes are considered, the result is a relatively small net expenditure reduction due to recession.

THE IMPACT OF INFLATION ON STATE AND LOCAL GOVERNMENT REVENUES AND EXPENDITURES

Inflation also has a double-edged impact on the financial position of state and local governments. In general, inflation tends to increase both revenue collections and expenditures. If inflation increased both revenues and expenditures by the same amount and at the same time, its impact on the state and local financial systems would not necessarily be disruptive. However, the impacts are not equal, and the relative magnitudes of the impacts upon revenues and expenditures take on considerable significance.

As with recession, the impact of inflation on revenues and the effects of inflation on expenditures have not been given equal attention. The impact of inflation on expenditures has been emphasized and much less attention has been paid to the revenue side.

Inflation and State and Local Government Revenue

Inflation has the potential to generate new state and local revenues which are proportionately greater than the change in the price level. The result may be an increase in real state and local government revenue collections.

The individual income tax is the tax source most susceptible to inflationary changes. If the tax structure is progressive, inflation will increase both the base upon which the income tax is levied and the rate of the levy. For example, in its study of *Inflation and Federal and State Income Taxes* (A-63), the Advisory

Table 15

INFLATION INDEXES FOR POTENTIAL REVENUES OF STATE AND LOCAL GOVERNMENTS, 1967-72

(1967 = 100)

	Property Tax	General Sales Tax	Selective Sales and Gross Receipts Tax	Individual Income Tax	Corporate Income Tax	Motor Vehicle License Tax	Total Taxes	Total Revenues*
State and Local	134.1	125.2	105.5	133.8	120.3	100.0	123.7	121.2
State	121.2	125.2	104.9	134.8	120.3	100.0	115.9	115.2
All Local	134.5	125.2	112.8	126.2	—	100.0	132.2	127.1

Notes: (1) The CPI index for 1972 equals 125.3.
(2) Indices are based on potential, not actual, yields. See text discussion.

*Excludes intergovernmental aid programs.

SOURCE: David Greytak and Bernard Jump, *The Effects of Inflation and Local Government Finances: 1967-74.* Occasional Paper No. 25 of the Metropolitan Studies Program of the Maxwell School of Citizenship and Public Affairs, Syracuse, NY, Syracuse University, 1975, Table 6.

Commission on Intergovernmental Relations estimated that "for the average state the real individual income tax increase due to a 6% inflation ranges from $12 to $17 million after one year."[51]

Other studies have also estimated the impact of inflation on state and local government revenue collections. David Greytak and Bernard Jump estimated inflationary impact by tax type for the 1967-72 period (*Table 15*).[52] Assuming that neither effective tax rates nor the revenue system changed between 1967 and 1972, this table shows the extent by which each of these tax sources would have increased because of inflation. For example, the general sales tax increased by 25.2%—similar to the increase in the Consumer Price Index of 25.3%.

As the table shows, the individual income tax more than kept pace with the rate of inflation. For all state and local governments, potential revenues from this tax source increased by almost 34% because of inflation between 1967 and 1972.

Greytak and Jump also estimated potential revenue gains due to inflation by level of government between 1972 and 1974. Their estimates indicate that inflation increased potential revenues for all levels of state and local government. However, the rate of increase varied for different levels of government depending upon the tax sources available to the various levels (*Table 16*).

Table 16

STATE AND LOCAL GOVERNMENT REVENUE INFLATION INDEXES BY LEVEL OF GOVERNMENT, 1972-74
(1972 = 100)

Type of Government	1974 Inflation Indexes for Revenues
States	113.6
Counties	115.9
Municipalities	114.6
Townships	116.1
School Districts	117.9
Special Districts	112.9

SOURCE: David Greytak, and Bernard Jump, *The Effects of Inflation on State and Local Government Finances, 1967-1974,* Occasional Paper No. 25, Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, Syracuse, NY, Syracuse University, 1975, Table 8.

Table 17

ESTIMATED IMPACT OF INFLATION ON STATE AND LOCAL REVENUES,[1] FISCAL YEARS 1973-76

Fiscal Year	Increase in Revenues Attributable to Inflation[2]: Revenue Increase (in billions)	Increase in Revenues Attributable to Inflation[2]: Percent of Own Source General Revenues
Total State-Local		
1973	$10.3	6.8%
1974	18.9	11.4
1975	28.4	15.7
1976	19.5	9.7
State		
1973	6.2	7.7
1974	11.3	12.7
1975	17.0	17.5
1976	11.6	10.8
Local		
1973	4.2	5.9
1974	7.6	9.9
1975	11.4	13.6
1976	7.8	8.4

[1]Own source general revenue.
[2]Based on regression analysis.
SOURCE: ACIR staff calculations. For details on the estimates, see *Table C-3* and *Appendix C.*

Our own estimates of revenue changes due to inflation reinforce the contention that inflation increases state and local government revenue potential (*Table 17*). These estimates indicate that state and local governments received about $19.5 billion in revenues in fiscal year 1976 because of the inflation. However, contrary to the Greytak-Jump estimates, the data contained in *Table 17* show states to be the major winners. In fiscal year 1976 their

revenues increased by about $11.6 billion, or by 10.8%, due to inflation Local governments gained $7.8 billion, or about 8.4%, because of the inflation.

The available evidence all seems to point in the same direction: inflation increases state and local governments' potential revenues in real terms. These automatic increases caused by inflation coupled with the distortion in interpersonal tax equity which results from inflation led the Commission to recommend that the states index their income tax structure.[53]

Inflation and State and Local Government Expenditures

While only a few rather technical studies have examined revenues and inflation, the effect of inflation on state and local government expenditures has received a great deal of attention. Inflation tends to increase state and local government spending by increasing state and local government costs. Governmental financial systems may be disrupted as a result.

Table 18 compares the changes in state and local government costs with price increases in the rest of the economy. The prices paid by state and local governments moved faster than both the GNP implicit price deflator and prices for consumer goods in all but one year between 1970 and 1977.

These rapid price increases have generated extended discussions on inflation and led to the State and Local Governments' Conference on Inflation in September 1974. At that conference state and local government officials pointed out in some detail the problems imposed by rapid cost increases and suggested possible solutions to eliminate some of the inflationary pressures.[54]

Recognizing that inflation remains a major problem for state and local governments, some interesting comments on its relative effects were presented in response to the survey of the Senate Subcommittee on Intergovernmental Relations. The survey found that some local governments—primarily those in the low and moderate unemployment range—reported inflation rather than recession to be the principal cause of their budgetary increases. For example, the city of Norwalk, CT, reported that:

> We cannot stress too strongly the fact that our community has found its fiscal problems far less influenced by the consequences of recession than from the substantially high operating costs resulting from inflation.[55]

Table 18

PERCENT CHANGES IN THE TOTAL GNP IMPLICIT PRICE DEFLATOR, AND THE COMPONENTS OF TOTAL PERSONAL CONSUMPTION, TOTAL FIXED INVESTMENT, FEDERAL, AND STATE-LOCAL GOVERNMENT, 1970-77

Price Level Changes (Percent)

Year	Total	Private Sector		Public Sector	
	GNP	Consumption	Investment	Federal	State and Local
1970	5.4%	4.5%	4.8%	8.0%	7.8%
1971	5.1	4.4	5.3	7.2	7.0
1972	4.1	3.5	4.3	8.0	5.8
1973	5.8	5.5	6.0	5.8	7.3
1974	5.6	10.8	10.5	9.5	10.3
1975	9.6	8.2	13.1	10.0	9.5
1976	5.3	5.3	5.6	5.7	6.2
1977	5.6	5.6	7.5	6.4	6.8

SOURCE: *Economic Report of the President, 1978,* Table B-3, p. 260 and ACIR staff computations.

The Net Effect of Inflation On State and Local Government Revenues and Expenditures

Inflation increases both the revenues and the expenditures of state and local governments; assessing its net effect requires analysis of both the timing and the magnitude of its impacts.

Very little work has been done on the timing aspect of inflationary impacts. However, informed speculation suggests that inflation tends first to increase potential revenue collections of state and local governments. The effect on expenditures is experienced after some lag when contracts with both unions and suppliers are renegotiated.

Studies have measured the relative magnitude of inflationary impacts on revenues versus expenditures of state and local governments. The Greytak and Jump study cited earlier also estimated purchasing power loss due to inflation by level of government. Prior to 1972, they found net gains from inflation. They found that between 1972 and 1974 inflation increased expenditures by about 25% for all levels of government while adding only between 13% and 16% to revenues of general purpose governments (*Table 19*). The net result was an inflation-induced loss in purchasing power. Of the general purpose governments, states suffered the most severe reduction in buying power over the two-year period.[56]

Our own estimates of inflationary revenue gains (*Table 17*) compared to the loss in purchasing power of government expenditure provides another view of the net impact of inflation on state and local government budgets. *Table 20* shows slight inflation-induced gains for fiscal years 1973-76. Based on these estimates inflation generally added more to state and local government revenue collecting potential than it took away in lost purchasing power. In the aggregate, state governments

Table 19

EXPENDITURE, REVENUE AND PURCHASING POWER INDEXES AND REVENUE BASE PURCHASING POWER LOSS, STATE AND LOCAL GOVERNMENTS, 1972-74

Type of Government	1974 Inflation Indexes (1972 = 100)		Index of 1974 Purchasing Power of 1972 Revenue Base [1,2] (1972 = 100)	Purchasing Power Loss[3] (in millions)
	Expenditures (1)	Revenues (2)	(3)	(4)
States	125.4	113.6	90.59	$6,648
Counties	125.4	115.9	92.43	1,038
Municipalities	125.4	114.6	91.39	2,021
Townships	125.5	116.1	92.51	233
School Districts	125.0	117.9	94.32	1,227
Special Districts	125.7	112.9	89.82	372

[1]1972 revenue excludes intergovernmental aid.
[2]Equal to: 100 (Col. 2/Col. 1).
[3]Equal to: (1972 revenues exclusive of intergovernmental aid) — [(Col. 3) (1972 revenues exclusive of intergovernmental aid)/100].

SOURCE: David Greytak and Bernard Jump, *The Effects of Inflation on State and Local Government Finances, 1967-1974,* Occasional Paper No. 25, Metropolitan Studies Program, Maxwell School of Citizenship and Public Affairs, 1975, p. 34; based on U.S. Bureau of the Census, Census of Governments, 1972, Vol. 4, No. 5, *Government Finances: Compendium of Government Finances.*

Table 20

ESTIMATED NET IMPACT OF INFLATION ON STATE AND LOCAL REVENUES FISCAL YEARS 1973-76

Fiscal Years	Inflationary[2] Increase in Revenues: Billions of Dollars	Inflationary[2] Increase in Revenues: Percent of Revenues	Inflationary[3] Loss in Purchasing Power: Billions of Dollars	Inflationary[3] Loss in Purchasing Power: Percent of Revenue	Net Gain[4] From Inflation: Billions of Dollars	Net Gain[4] From Inflation: Percent of Revenues
Total State-Local						
1973	$10.3	6.8%	$ 9.4	6.3%	$ 0.9	0.6%
1974	18.9	11.4	12.4	7.5	6.5	3.9
1975	28.4	15.7	18.5	10.2	9.9	5.5
1976	19.5	9.7	13.8	6.9	5.7	2.9
State						
1973	6.2	7.7	5.0	6.3	1.1	1.4
1974	11.3	12.7	6.7	7.5	4.6	5.2
1975	17.0	17.5	9.9	10.2	7.1	7.3
1976	11.6	10.8	7.4	6.9	4.3	4.0
Local						
1973	4.2	5.9	4.4	6.3	-0.2	-0.4
1974	7.6	9.9	5.8	7.5	1.9	2.4
1975	11.4	13.6	8.6	10.2	2.8	3.4
1976	7.8	8.4	6.4	6.9	1.5	1.6

[1]Own source general revenue.
[2]Based on regression analysis.
[3]Based on percent increase in implicit price deflator for state and local purchases of goods and services.
[4]Net gain equals inflationary increase in revenue minus inflationary loss in purchasing power, expressed in nominal dollars.

Time series regression analysis was computed for each level of government using fiscal year data for the period 1957-76. The model was specified as follows:
$\triangle R = \alpha + B_1 \triangle GAP + B_2 \triangle DEFL$.

$\triangle R$ = Change in own source general revenues.
$\triangle GAP$ = Change in the nominal GNP GAP.
$\triangle DEFL$ = Change in the implicit price deflator for GNP.

Regression Results

	Coefficient estimated for: Constant	△GAP	△DEFL	R^2	Durban Watson
Total	1.15	-0.12 (5.54)	236.42 (11.28)	.883	1.35
State	0.33	-0.08 (5.91)	141.21 (10.31)	.857	2.01
Local	0.82	-0.04 (3.53)	95.21 (9.59)	.859	0.99

(T values are in parentheses.)

Source: ACIR staff compilation.

come out better than local governments because their revenue systems are more sensitive to inflation. In 1973, local governments actually suffered a $200 million net loss because of the inflation. In 1976 however, they gained a net $1.5 billion due to the inflation, while states gained about $4.3 billion.

These two methods for estimating the net effect of inflation on state and local budgets do not agree on the direction of the overall impact. They do agree that the impact was modest in amount. Neither set of estimates indicate large budget disruptions caused by inflation.

ESTIMATING THE IMPACT OF SIMULTANEOUS RECESSION AND INFLATION ON STATE AND LOCAL GOVERNMENT FINANCES[57]

Determining the overall impact of swings in the business cycle and price level on state and local government finances requires combining the revenue loss resulting from recession with the net gains caused by the inflation. *Table 21* presents our estimates of the effect of the combination of recession and inflation on state and local government finances for fiscal years 1973-76.

Based on these estimates, in the aggregate state and local governments lost about $10.6 billion or about 5.3% of their own source revenues, from the combination of recession and inflation in fiscal year 1976. State revenue systems are more sensitive to swings in the business cycle than are the revenue systems of local governments. As a result, states lost about $7.1 billion in revenue because of overall economic conditions in fiscal year 1976. Local governments, on the other hand, lost only about $3.5 billion for the same year.[58]

The overall estimated losses are not excessively severe. It should be remembered, however, that these estimates are for aggregate

Table 21

ESTIMATED NET IMPACT OF INFLATION AND RECESSION ON STATE AND LOCAL OWN SOURCE GENERAL REVENUES, FISCAL YEARS 1973-76

Fiscal Years	Net[1] Revenue Gain From Inflation		Net[2] Revenue Change Due to Recession		Net Revenue Loss (–) or Gain (+) From Inflation and Recession	
	Billions of Dollars	Percent of Revenues	Billions of Dollars	Percent of Revenue	Billions of Dollars	Percent of Revenues
Total State and Local						
1973	$0.9	0.6%	$+0.3	+0.2%	$+1.2	+0.8%
1974	6.5	3.9	-2.5	-1.5	+3.9	+2.4
1975	9.9	5.5	-16.0	-8.8	-6.1	-3.6
1976	5.7	2.9	-16.4	-8.2	-10.6	-5.3
State						
1973	1.1	1.4	+0.2	+0.2	+1.3	+1.7
1974	4.6	5.2	-1.8	-2.0	+2.8	+3.2
1975	7.1	7.3	-11.2	-11.6	-4.1	-4.2
1976	4.3	4.0	-11.4	-10.6	-7.1	-6.7
Local						
1973	-0.2	-0.4	+0.1	+0.1	-0.2	-0.2
1974	1.9	2.4	-0.8	-1.0	+1.1	+1.4
1975	2.8	3.4	-4.8	-5.7	-2.0	-2.4
1976	1.5	1.6	-4.9	-5.3	-3.5	-3.7

[1]Net revenue gain due to inflation is equal to estimated inflation-related revenue increases minus the loss of purchasing power of revenues (see *Table 20*). NOTE: This refers only to own source general revenue.

[2]Net revenue loss due to recession is the revenue shortfall state and local governments do not cover with tax rate increases.

Source: ACIR staff compilations.

losses and include places like Texas which barely felt the recession and places like New York on the other end of the scale. For certain state and local governments already under severe financial stress, a 5% revenue loss could be critical to their continued successful operation. (For detailed state-by-state estimates of loss, see *Appendix C.*)

CONCLUSION

Based on this analysis of the impact of aggregate economic swings on state and local finances, the following two conclusions can be drawn:

1. **Recession generally tends to increase automatically certain state and local government expenditures. After a lag period, state and local government expenditures are reduced by slightly more than the initial increase.**

2. **During the last recession, the combination of inflation and recession led to an erosion of the revenue position of state and local governments in the aggregate. While the net effect was not devastating, at the margin it was sufficient to cause some financial distress.**

FOOTNOTES

[1]For a review of other studies in this area see *Appendix A.*

[2]While state and local government own source expenditures have been falling in relation to GNP, own source revenues have been holding steady or rising in relation to GNP during the last two years resulting in increased surpluses.

[3]It is estimated that direct federal aid to Cleveland will rise from about 23% of own source general revenue in 1976 to about 68% in 1978.

[4]Since the choice of multipliers is to some extent arbitrary, a number of different multipliers as well as lag structures were tried. These results are detailed in *Appendix B.* In general, all of the multipliers which could be considered reasonable yielded the same sign for state and local financial impact. However the degree of that impact varied depending upon the particular set of multipliers used.

[5]U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, Vol. 56, #2, Washington, DC, U.S. Government Printing Office, Feb. 1976, p. 5.

[6]Advisory Commission on Intergovernmental Relations, *Significant Features of Fiscal Federalism, 1976-77, Vol. II*, M-110, Washington, DC, U.S. Government Printing Office, March 1977, p. 50.

[7]John Cornwall, *Growth and Stability in a Mature Economy*, New York, NY, John Wiley and Sons, 1972, pp. 134-7.

[8]For a detailed discussion of this position see, W. J. Baumol, "Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crisis," *The American Economic Review*, 3, Nashville, TN, American Economic Association, 1967, pp. 415-26; and Jiri V. Skolka, "Unbalanced Productivity Growth and the Growth of Public Services," *Journal of Public Economics*, Vol. 7, No. 2, Amsterdam, Netherlands, North-Holland Publishing Co., April 1977, pp. 271-80.

[9]U.S. Senate, Committee on Government Operations, Subcommittee on Intergovernmental Relations, *Intergovernmental Anti-Recession Assistance Act of 1975*, Hearings on S. 1359, 94th Cong., 1st Sess., Washington, DC, U.S. Government Printing Office, 1975.

[10]*Ibid.*, pp. 101-03.

[11]*Ibid.*, p. 116.

[12]*Ibid.*, p. 120.

[13]U.S. House of Representatives, Committee on Government Operations, Subcommittee on Intergovernmental Relations and Human Resources, *Intergovernmental Anti-Recession Assistance Act of 1977*, Hearings on H.R. 3730 and Related Bills, 95th Cong., 1st Sess., Washington, DC, U.S. Government Printing Office, March 1, 2, and 8, 1977, pp. 143-292.

[14]*Ibid.*, p. 144.

[15]David T. Stanley, "Running Short, Cutting Down: Five Cities in Financial Distress," Washington, DC, The Brookings Institution, March 1976, unpublished manuscript.

[16]*Ibid.*, p. 2-7.

[17]*Ibid.*, p. 3-1.

[18]*Ibid.*, pp. 4-1 and 4-2.

[19]*Ibid.*, p. 3-10.

[20]Roy W. Bahl, "Recession, Inflation and the State/Local Fisc," *Public Management*, Vol. 57, No. 3, Washington, DC, International City Management Association, March 1975, p. 3.

[21]Wayne F. Anderson and John Shannon, "Slumpflation—Its Effect on Local Finances," *Public Management*, Vol. 57, No. 3, Washington, DC, International City Management Association, March 1975, p. 5.

[22]U.S. Congress, Joint Economic Committee, Subcommittee on Urban Affairs, *The Current Fiscal Position of State and Local Governments*, Survey of 48 State Governments and 140 Local Governments, 94th Cong., 1st Sess., Washington, DC, U.S. Government Printing Office, Dec. 17, 1975.

[23]*Ibid.*, pp. 3-9. It should be noted that these figures do not net out the $50 million in tax cuts nor the $100 million in expenditure increases which the survey also found.

[24]*Ibid.*, pp. 10-17.

[25]*Ibid.*, p. 21. This figure includes an estimate of $600 million for capital projects delayed or canceled; this estimate is derived from the study by subtracting the $400 million state capital expenditure cutback from the upper limit of the study's estimate of $600 million to $1 billion for state-local cutbacks.

[26]*Ibid.*, p. 21.

[27]National Association of State Budget Officers, *State Fiscal Survey*, fiscal years 1975, 1976, and 1977, Summary Report, Lexington, KY, National Association of State Budget Officers, Feb. 1977, p. 3.

[28]*Ibid.*, p. 2.

[29]A more recent survey shows that in fiscal year 1977 actual state balances increased to $4.1 billion and are estimated to increase again in fiscal year 1978 to $4.9 billion. National Association of State Budget Officers and National Governors' Association, Center for Policy Research, *Fiscal Survey of the States, Fall 1977*, Washington, DC, National Governors' Association, Dec. 1977.

[30]Of the five cities which had operating deficits in fiscal year 1976, two had accrued surpluses in fiscal year 1977; the other three reduced their combined deficits by 34 percent.

[31]U.S. Congress, Joint Economic Committee, Subcommittees on Economic Growth and Stabilization and on Fiscal and Intergovernmental Policy, *The Current Fiscal Condition of Cities: A Survey of 67 of the 75 Largest Cities*, a study, 95th Cong., 1st Sess., Washington, DC, U.S. Government Printing Office, July 28, 1977.

[32]*Ibid.*, p. 2.

[33]U.S. Senate, Committee on Governmental Affairs, Subcommittee on Intergovernmental Relations, *The Countercyclical Assistance Program: An Analysis of Its Initial Impact*, 95th Cong., 1st Sess., Washington, DC, U.S. Government Printing Office, Feb. 28, 1977.

[34]*Ibid.*, pp. 13-14.

[35]*Ibid.*, p. 3.

[36]The Comptroller General of the United States, Report to Congress, *Antirecession Assistance is Helping But Distribution Formula Needs Reassessment*, Washington, DC, U.S. General Accounting Office, July 20, 1977. Also see for more detail, The Comptroller General of the United States, *Impact of Antirecession Assistance on 15 State Governments; Impact of Antirecession Assistance on 16 County Governments;* and *Impact of Antirecession Assistance on 21 City Governments*, Washington, DC, U.S. General Accounting Office, Feb. 22, 1978.

[37]Losses are calculated as:

$$L = T_f - T_0$$

$$\text{where } T_f = T_0 \left[1 + \eta \frac{(PGNP-GNP)}{GNP} \right]$$

L = dollar loss

T_f = projected tax collection at full employment GNP

T_0 = actual tax collection

η = tax elasticity

PGNP = potential GNP

GNP = actual GNP

[38]David Greytak and A. Dale Tussing, "Revenue-Stabilizing Grants: A Proposal," *Proceedings of the Sixty-Fourth Annual Conference on Taxation*, National Tax Association, Kansas City, MO; Columbus, OH, National Tax Association, Sep. 26-30, 1971, pp. 47-54.

[39]*Ibid.*, p. 53.

[40]The Comptroller General of the United States, *Antirecession Assistance—An Evaluation*, Report to Congress, Washington, DC, U.S. General Accounting Office, Nov. 29, 1977, pp. 99-102.

[41]For example, see Robert E. Berney, "Income Elasticities for Tax Revenues: Techniques of Estimation and Their Usefulness for Forecasting," unpublished Washington State University working paper, presented at the Conference of the Western Economic Association, Aug. 30, 1971.

[42]U.S. Congress, Joint Economic Committee, Robert C. Vogel, "The Responsiveness of State and Local Receipts to Changes in Economic Activity: Extending the Concept of the Full Employment Budget," *Studies in Price Stability and Economic Growth*, 94th Cong., 1st Sess., Washington, DC, U.S. Government Printing Office, June 30, 1975, pp. 23-24.

[43]*Ibid.*, pp. 21-35.

[44]*Ibid.*, p. 28. Vogel uses the following model:

$$\text{Receipts} = R_0 e^{rt} p^a (Y/Y_F)^b$$

See *Appendix C.*

[45]*Ibid.*, p. 24.

[46]The equation used to estimate the revenue loss was:

$$\Delta R = a + b_1 \Delta P + b_2 \Delta(Y_F - Y) \quad \text{See } Appendix\ C.$$

[47]See *Appendix C.*

[48]It should also be noted that the simple correlation between our estimates of state revenue loss and total unemployment was .89 indicating a *strong* relationship between total unemployment and revenue loss by state.

[49]*Anti-Recession Assistance—An Evaluation*, op. cit., p. 89.

[50]The estimating equation was:

$$\Delta EXP_t = a + b_1 \Delta(Y_F - Y)_t + b_2 \Delta(Y_F - Y)_{t-1} + b3 \Delta P_{t-1} \quad \text{See } Appendix\ C.$$

[51]The Advisory Commission on Intergovernmental Relations, *Inflation and Federal and State Income Taxes*, A-63, Washington, DC, U.S. Government Printing Office, Nov. 1976, p. 46.

[52]David Greytak and Bernard Jump, *The Effect of Inflation on State and Local Government Finances: 1967-1974*, Occasional Paper No. 25 of the Metropolitan Studies Program of the Maxwell School of Citizenship and Public Affairs, Syracuse University, Syracuse, NY, Syracuse University, Maxwell School of Citizenship and Public Affairs, 1975.

[53]ACIR, A-63, op. cit., p. 10.

[54]*Summary of the State and Local Governments' Conference on Inflation*, Sep. 23, 1974.

[55]*The Countercyclical Assistance Program: An Analysis of Its Initial Impact, op. cit.*, p. 16.

[56]Greytak and Jump, op. cit., p. 34.

[57]For more detail on the estimating procedures, see *Appendix C.*

[58]Care is required in interpreting the relative state v. local loss estimates provided in the table. Because of the estimating procedures used, local governments' gains from inflation may be overestimated. As a result, their net losses would be underestimated. The actual state v. local percentage loss numbers are probably closer than they appear in the table.

State-Local Fiscal Behavior and Aggregate Economic Stability—A Review of Past Studies

One of the goals, perhaps the predominant goal, of federal antirecession grants-in-aid is to promote greater coordination between federal fiscal policy and state-local government budgetary behavior during periods of economic recession. This goal implies either that a lack of coordination presently exists or that, although state and local governments are acting "correctly," they should be doing more—the national agent argument. In the former case, state and local governments are assumed to behave in a "perverse" manner. That is, when the economy is experiencing a recession and stabilization policy calls for increased spending and/or tax reduction, state and local governments are either reducing expenditures, increasing tax rates, or both. When the economy is experiencing rapid growth and inflation and national fiscal policy calls for reductions in aggregate demand, state and local governments, according to the perversity argument, are increasing expenditures and/or reducing taxes.

Previous studies of past state-local fiscal behavior, however, often have not supported the perversity hypothesis. This appendix describes the findings of past studies in economic literature with respect to the "perversity" hypothesis.

EXPECTED RESPONSE OF STATE AND LOCAL GOVERNMENTS TO CYCLICAL FLUCTUATIONS

Like old wives tales in other professions, economics has its share of "conventional wisdom" which ranges in validity from totally false to half truths, to reasonably scientific speculations. Conventional economic wisdom says that state and local fiscal behavior will be pro-cyclical. In other words, their behavior will be perverse with respect to economic stability. State and local governments will tend to raise taxes and reduce expenditures during periods of recession and reduce taxes and increase expenditures when the economy is expanding.

Origins of the Perversity Hypothesis

The "perversity hypothesis" may be traced to the classic study done by Alvin H. Hansen and Harvey S. Perloff of state-local fiscal behavior during the Depression.[1] Hansen and Perloff summarize their findings as follows:

> The taxing, borrowing, and spending activities of the state and local governments collectively have typically run counter to an economically sound fiscal policy. These governmental units have usually followed the swings of the business cycle, from crest to trough, spending and building in prosperity periods and contracting their activities during depression. In the boom of the late 20s, they added to the disposable income of the community, and bid up prices and building costs in large-scale construction activities. In the depressed 30s, the fiscal policies of these governments exerted a deflationary rather than an expansionary effect

on the economy: expenditures, and especially construction outlays, were severely reduced, borrowing was restricted, and taxes weighing on consumption were substantially increased.[2]

A number of reasons have been offered to explain this behavior. The two most important reasons concentrate on the income elasticity of state and local revenues and expenditures and the institutional restrictions within which state and local budget decisions are made.

Perversity and Income Elasticity[3]

The income elasticity explanation of perverse behavior separates discretionary from automatic changes in state and local revenues and expenditures. It rests on two not necessarily consistent hypotheses about state and local budget behavior.

The hypothesis most often put forth begins with the assumption that state and local revenues are income elastic. Recessions induce falls in the level of income causing reductions in tax collections. If the process stopped at this point and state and local governments did nothing, their behavior would reinforce rather than contradict federal fiscal policy. But in order to offset these revenue reductions, state and local governments will actively seek to increase tax rates and reduce expenditures thus reducing aggregate demand and counteracting federal attempts to stimulate the economy.

During periods of rapid growth and inflation, state and local tax collections will rise. In order to rid themselves of unwanted surpluses, state and local governments will actively seek to reduce tax rates and/or increase expenditures, thereby stimulating aggregate demand and impeding federal attempts to control inflation.

According to this explanation of financial behavior, the automatic revenue changes are countercyclical. It is not until the state and local units take action in an attempt to actively offset these automatic changes that perverse behavior occurs.

The second reason given for perverse behavior involves the responses of both state and local revenue and expenditure systems to changes in economic activity. The contention put forth is that state-local expenditures are more income elastic than state-local revenue collections. Thus as income falls because of a recession, taxpayers' demands for public services decrease by more than revenue collections and surpluses are increased and/or deficits reduced. As a result, state-local finances act as a drag on the economy when stimulation is called for. During periods of inflation, expenditures increase more rapidly than revenues and state-local governments tend to stimulate the economy when a reduction in aggregate demand would be more appropriate. Thus according to this argument, perverse behavior is a result of differences in the income elasticity of the revenues and expenditures of state and local government.

Institutional Restrictions

The second part of the perversity hypothesis concerns the institutional and statutory environment within which state and local financial decisions are made. Most state and local governments are required by constitution to operate with balanced budgets which restrict potential stabilization activity. Many earmark some revenues, thereby further reducing budget flexibility. Most also have debt limitations based on assessed property value. During periods of recession, assessed value may fall thereby reducing potential borrowing activity; during recovery and growth assessed values rise, allowing more debt and capital expenditures. As a result it is simply easier for state and local governments to use deficit financing during periods of growth and inflation. These institutional limitations tend to discourage countercyclical actions and encourage perversity on the part of state and local governments.[4]

Based primarily upon these two general considerations, the hypothesis that state and local governments will perform in a manner contrary to appropriate stabilization policy has become a part of conventional economic wisdom.[5] The only major ingredient this bit of conventional wisdom lacks is empirical support.

MEASURING STATE-LOCAL FISCAL BEHAVIOR

There are three general problems which must be solved in any attempt to prove or disprove

the perversity hypothesis. The first of these problems is the definition of perversity: what constitutes perverse behavior? Perverse with respect to what? The second concerns the measurement standard. The third is the definition of state and local fiscal behavior. Should federal aid, state-local trust accounts, etc., be included in a study of perversity?

What Constitutes Perverse Behavior?

In a general sense, state and local financial behavior may be defined as perverse with respect to "appropriate" fiscal policy if it adds to the income stream during periods of rapid growth and inflation and/or reduces the income stream during periods of recession and depression. Such behavior increases the severity and duration of the economic fluctuation and makes full utilization of resources at stable prices more difficult to achieve. If state and local behavior is stimulating during periods of recession or depression and dampening during periods of inflation and rapid growth, it is considered countercyclical or stabilizing.

To move from a general definition of perverse behavior to a definition which specifies the exact degree of perversity is difficult. For example, to say that "x" amount of stimulation is appropriate on the part of state and local governments during any given quarter requires a definition of "appropriate." That definition should be based upon explicit fiscal policy goals and a macroeconomic model which estimates the extent to which those goals are being achieved. A review of the *Economic Report of the President* for the last four or five years shows a lack of agreement concerning the goals of fiscal policy and the macroeconomic model to be used.

Even less rigorous definitions make interpretations of fiscal changes at best difficult. For example, at what point should state and local governments end their stimulative behavior to be in tune with national policy? Exactly at the cycle trough? One calendar quarter after the trough, etc.? How stimulative should state and local governments be? Because of these definitional problems, we are left examining the direction of changes from peak to trough and trough to peak with little to conclude about the appropriateness of timing or magnitude.

Perverse with Respect to What?

At least three different standards may be used to measure perverse behavior. These are (1) the business cycle of the national economy; (2) the full employment growth level of the national economy; or (3) the business cycle of the region.

THE NATIONAL BUSINESS CYCLE

The classical standard used to determine perverse behavior is the national business cycle. The business cycle is defined as including "recurrent (but nonperiodic) cumulative expansions and contractions, which are diffused over a multitude of economic processes and involve such major aggregates as national income and product."[6] Each of the fluctuations has a high point or peak and a low point or trough. The movement from peak to trough is referred to as the contraction phase of the cycle while the movement from trough to peak is the expansion. The duration of any cycle is the length of time covered and the amplitude is the size of the fluctuation.

Measuring the duration of each cycle and dating the turning points may be done in a number of ways. The two most common methods are to use either a single comprehensive aggregate such as GNP, or the National Bureau of Economic Research's "reference cycle" concept which dates turning points by combining selected indicators from composite and diffusion indexes.[7]

Using the reference cycle from trough to trough as the standard, state-local financial behavior would be stabilizing if its stimulation of the economy is U-shaped—decreasing from trough to peak and increasing from peak to trough.[8]

FULL-EMPLOYMENT GROWTH

From the end of World War II to the early 1960s, stabilization policy relied primarily upon automatic stabilizers to cushion changes in the level of economic activity. With the 60s came fine tuning and the "new fiscal policy" which emphasized full utilization of resources and long-term growth rather than the relatively simpler problem of stabilization. This "new fiscal policy" brought with it a new goal, a dif-

ferent set of problems, and a new vocabulary. Measuring "potential GNP" and the "GNP gap" replaced the more traditional debates on cyclical deviation and turning points.[9] Along with this new emphasis came a new standard for judging fiscal policy. The contribution of state and local government to full resource utilization and long-run growth became the scale for measuring perversity.

This change in emphasis may be attributed to two general trends. First, since the 1930s cyclical fluctuations have become less and less severe. As a matter of fact, the sustained period of prosperity from 1961 through 1969 led some economists to question whether the business cycle concept was still valid. Pointing to the "recognized success" of the 1964 tax cut and the unprecedented length of the expansion, they contended that discretionary monetary and fiscal policy "wisely applied" had eliminated the possibility of severe recession[10] and therefore the need for emphasis on ways to control the cycle.[11]

The second and probably more important reason for the change in emphasis from cyclical fluctuations to long-term growth is the federal government's acceptance of its responsibility for maintaining full utilization of resources at stable prices as outlined in the *Employment Act of 1946.*

In commenting on the change in emphasis Walter Heller pointed out that:

> We at last accept in fact what was accepted in law 20 years ago (in the *Employment Act of 1946*), namely, that the federal government has an overarching responsibility for the nation's economic stability and growth. And we have at last unleashed fiscal and monetary policy for the aggressive pursuit of those objectives.[12]

He also comments that in implementing this new orientation,

> Policy emphasis had to be redirected from a *corrective* orientation geared to the dynamics of the cycle, to a *propulsive* orientation geared to the dynamics and the promise of growth. For this purpose, it was essential that the Council of Economic Advisers formulate specific, usable models within which to relate prognosis and prescription, economic targets and economic policies.
>
> The main instrument for dethroning the cyclical model and enthroning the growth model has been the GNP or *performance gap* and the associated estimates of the economy's potential and growth rate at 4% unemployment ("full" or "high" employment). These guides have now passed the rugged test of five years' use as benchmarks for policies to match demand with capacity, culminating in the virtual closing of the gap as the economy reached and broke through the 4% unemployment level early in 1966.[13]

The Goal

The "new fiscal policy" has at its heart eliminating the GNP "gap"—the difference between actual and potential GNP. Potential GNP may be defined as "a measure of the goods and services that could be procured at a reasonably stable price level with the use of best available utilization of both capital and labor consistent with the prevailing full-employment norms of the economy."[14]

In order to measure the GNP gap and prescribe appropriate fiscal policy, potential GNP must first be estimated. A number of techniques are available for making such an estimate. Each technique will provide slightly different results; the results will vary according to the assumptions concerning the level of the full employment norm.[15]

The Standard

Emphasis on eliminating the GNP gap changes the standard used to define appropriate fiscal policy. It requires more flexibility in the use of discretionary fiscal tools and, as suggested by Gordon, subjects those tools "to the constraint that restrictive fiscal measures are not to be taken during an expansion if a significant full employment 'gap' exists."[16]

Under the new standard, perversity is defined with respect to the elimination of the GNP gap rather than with respect to the busi-

ness cycle. As Richard Musgrave has pointed out "... in a period when the cycle does not fluctuate around full employment and leaves substantial unemployment, stabilization effects in the upturn are undesirable, and it is precisely this perversity which measures the 'goodness' of fiscal behavior."[17]

Chart A-1, using "old potential GNP," illustrates this point. Classical business cycle theory would have required expansionary fiscal policy from 1969:I to 1970:IV and then some degree of contraction from 1970:IV to 1973:III. If elimination of the GNP gap is used as the standard, "correct" fiscal behavior would have required expansionary activity throughout the entire period.

Applying the New Standard

While the GNP gap is the presently accepted standard for defining "appropriate" fiscal behavior at the federal level, translating it into a measure by which to judge state and local financial behavior presents some difficulties. A major problem is that the standard is subject to change. There is no perfect model to estimate potential GNP and as a result each time the Council of Economic Advisers changes the assumptions underlying the estimates of full employment GNP, the definition of perverse behavior also may change. For example, the Council of Economic Advisers recently reestimated potential GNP using a flexible unemployment rate which estimated full employment at 4.9% unemployment in 1976 and full employment of fixed capital at .86% of the manufacturing capacity utilization index as calculated by the Department of Commerce.[18] *Chart A-1* also compares actual, old potential, and new potential GNP.

Using the "new" potential GNP, actual GNP was above potential in 1973 and "appropriate" fiscal policy would have called for financial restraint during that period. Using the old definitions, stimulation was called for. The point is that by changing some of the assumptions, estimates of the size of the gap change, and in the process the definition of "appropriate" fiscal policy also changes.

A simplistic, but straight forward view of the coordination issue could be that compliance with the purpose of antirecession aid only requires that both the federal government and state and local governments move in the same fiscal direction. Such a view implies that the federal government is sure of the "correct" fiscal policy. However, as Bert Hickman found in his study of the period from 1946 to 1958, "the least stable of the major components of domestic expenditures for final goods and services" was federal spending.[19] Simply behaving in the same way as the federal government is not enough. A standard is necessary.

THE BUSINESS CYCLE OF THE REGION

A final standard for determining the degree of state and local government fiscal perversity is the regional business cycle applicable to the particular region within which the state or local government is located. A number of scholars have suggested that national business cycles affect different regions of the country both to a different degree and in different time periods. For example, in his study of regional stabilization policy for the period 1949-58, Stanley Engerman found large differences in the magnitude of the cyclical fluctuations between the states, but small differences in the turning points. He attributed these variations in degree to differences in industrial composition, diversification, and growth among the states.[20]

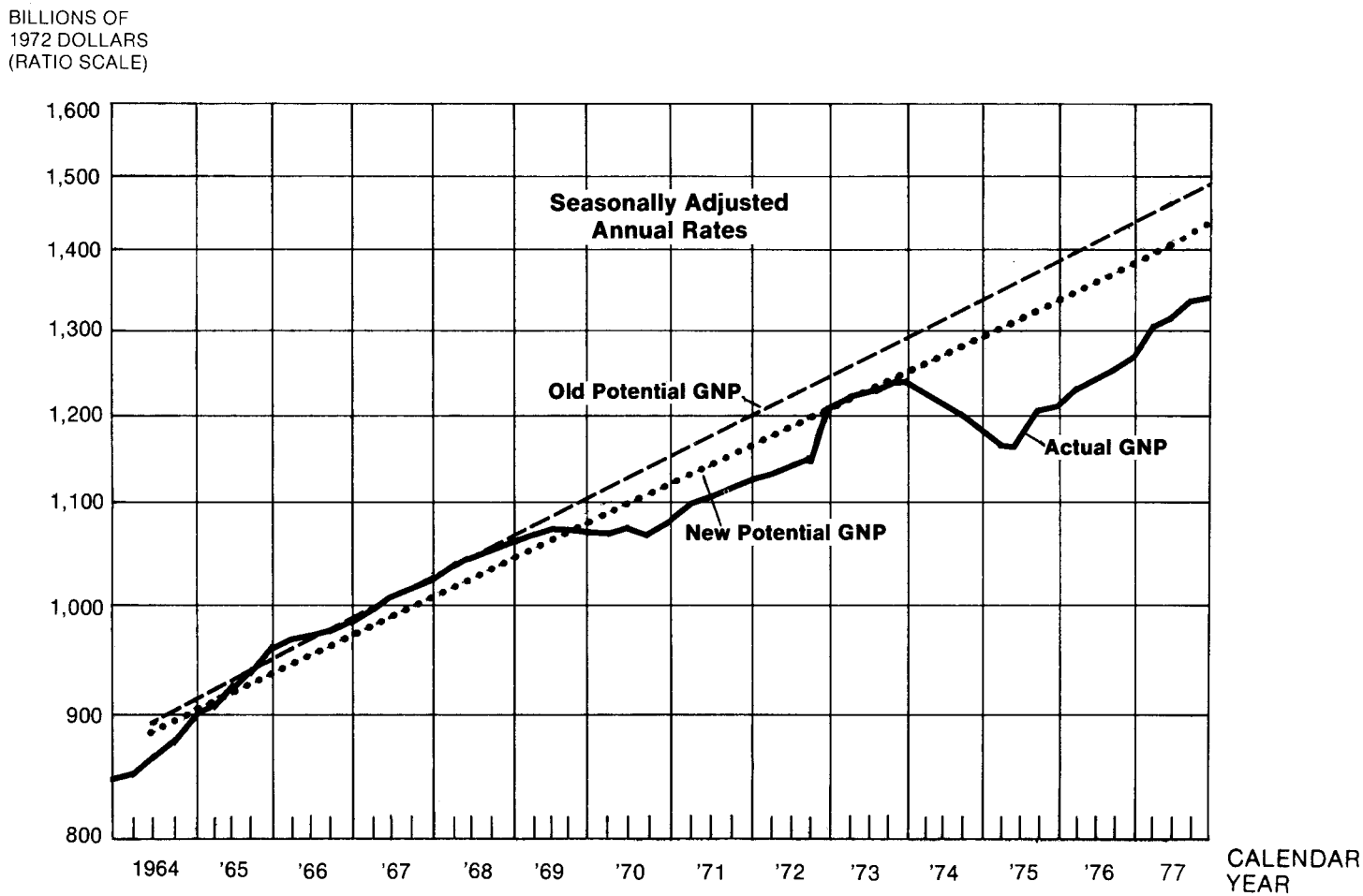
More recently Robert Bretzfelder examined regional sensitivity to national business cycles for the period 1948-70. He also found large differences in the amplitude of the cyclical swings among the various regions with the Great Lakes and the southeast most sensitive to cyclical fluctuations. He attributed the degree of sensitivity to differences in the industrial composition of the various regions and found that sensitivity is primarily determined by the behavior of income during periods of recession.[21]

Donald Ratajezak examined the south's responsiveness to the economic fluctuation from 1974 to 1976 and predicted that the south would have a much more rapid recovery from the current recession than the rest of the nation.[22]

Finally Joseph Ziegler found interurban cycle differences for nine cities from 1954 to 1968.[23] Using changes in nonagricultural employment to mark the various cycles, he found differences in the cyclical turning points and even the number of cycles experienced among

Chart A-1

GROSS NATIONAL PRODUCT, ACTUAL AND POTENTIAL, 1964-77



SOURCE: *Economic Report of the President, 1977,* p. 55; U.S. Department of Commerce; *Survey of Current Business;* new potential GNP for 1977 provided by the Council of Economic Advisors.

the various cities. Ziegler's evidence raises doubts over the desirability of local-federal fiscal policy coordination. If urban cycles are significantly different from the national business cycle, coordination may tend to exacerbate rather than reduce local fluctuations.

These studies do indicate that the impact of the business cycle varies among regions. They do not, however, argue against use of the national cycle as the appropriate standard for judging state-local fiscal behavior. While regional differences should be recognized in any policy aimed at increasing the degree of coordination between the various levels of government, it is still the change in the aggregate level of economic activity which is most important.

The conclusion is that there is no clear-cut definition of "perverse" behavior. There are at least three standards for defining perversity—the business cycle, the new potential GNP, and regional cycles. The extent to which there is a fiscal coordination problem depends upon the standard which one chooses to use.

WHAT TO INCLUDE AS STATE-LOCAL FISCAL BEHAVIOR

The study of countercyclical fiscal coordination by the federal government and state and local governments raises the additional question of what to count as a part of state and local fiscal behavior. The controversy centers on how to treat grants-in-aid and trust accounts.

Grant-in-aid expenditures can be attributed to the donor or the recipient government. Most studies treat the grant as an expenditure of the donor government and the recipient government's expenditures are reduced by the amount of the grant. This treatment assumes that the recipient government's own source expenditures would have been the same with or without the grant. There is neither grant stimulation of the recipient's own source expenditures nor substitution for own source expenditures.[24] Such a policy attributes all of the fiscal initiative to the donor government.

A second method for counting grants-in-aid is to divide the grants between those which are used to purchase goods and services and those which are transfer expenditures. The initiative with respect to grants used to purchase goods and services is then attributed to the recipient government while that of transfer payments is attributed to the donor government.[25]

A third technique is to view the grants-in-aid as expenditures by the recipient government.

As long as double counting is avoided and the method chosen is consistently applied, any of the techniques may be used. Interpretation of results varies, however, depending upon the method chosen. Whether state and local government fiscal behavior is or is not deemed perverse may depend on the attribution of the grant-in-aid expenditures.

The treatment of social insurance trust fund and government enterprise accounts raises equally thorny issues. States and localities make substantial contributions to social insurance accounts—e.g., retirement funds—and invest and disburse these funds. Government enterprises are generally self-sufficient and financed by user charges or sales to the public. Some argue that because state and local governments have little or no control over these funds, neither revenues nor expenditures of these funds should be counted in gauging whether state and local fiscal behavior is cyclically perverse.

STUDIES OF THE IMPACT OF STATE AND LOCAL FISCAL BEHAVIOR ON AGGREGATE ECONOMIC ACTIVITY

The study of the influence of state-local fiscal behavior on the economy may be characterized as the search for a number. In their introduction to "Analytical Foundations of Fiscal Policy," Blinder and Solow described the search as follows:

> We begin in the following section with an analysis of the proper way to define a summary number that will answer the question, "How expansive—or contractionary—is fiscal policy this year as compared with, say, last year, or with some other policy?" This is not a question that the analytical economist has to answer. At a sufficiently austere level, every fiscal policy can be described in terms of its natural

parameters—tax rates, specific expenditures, financial details, and so on—and a complete macroeconomic model will grind out the resulting income and employment totals. One fiscal policy is more expansionary than another if, and to the extent that, it induces a higher level of aggregate output. But experience shows that for political debate this simply will not do. The public seems to need a number, traditionally a budget deficit, to view with pride or alarm as the case may be. Even if there is no one right way to provide a single number, simple models suggest that there are better and worse ways.[26]

They go on to add that:

> None of this necessarily argues for a single number to be used as "the" measure of fiscal influence. Whenever one attempts to reduce a multidimensional concept—like the influence of the government on aggregate economic activity—to a single dimension, index number problems inevitably arise. Furthermore, examples abound of democratic (and even undemocratic) countries in which the announcement of the government budget marks the beginning of a vigorous economic debate without a focus on a single number like the deficit. A case can indeed be made for educating the public to a multibudget concept just as the Council of Economic Advisers under Walter Heller educated it to the full employment surplus. However, the political realities of the day seem to dictate settling on a single index to measure the overall expansionary or contractionary effect of any proposed tax and expenditure program. If economists do not come up with one, the public or the Congress will probably invent its own, and the choice is unlikely to be the best. Instead, then, of trying to talk the layman out of seeking such a number, economists might do better to lead him to a "sensible" concept of the government deficit. Furthermore, economics is not—or at least should not be—silent on such questions as how much increase in the automobile excise tax rate it would take to cancel out the expansionary effects of defense spending. If economic models can reduce the various dimensions of the government budget to a single, common, denominator, why not use them? For these reasons, we believe that developing a single number to measure fiscal influence is a legitimate scholarly exercise.[27]

Since that single magic number is yet to be found, the search continues. Given the problems of disaggregation at the state and local level we are further away from agreeing upon that number than at the federal level. The following studies provide insight into exactly how far away we are from finding "the" number.

Studies Examining Changes in State and Local Revenues, Expenditures, and Surpluses During the Depression

Most of the empirical studies prior to the 1960s concentrated on the impact of state and local fiscal behavior during the Depression of the 1930s.[28] The most influential study of the period is undoubtly that done by Hansen and Perloff.[29] The fiscal perversity hypothesis developed in this study relies on an examination of taxes, borrowing, and spending of state and local governments for the period 1928-39. Based on these three data series, Hansen and Perloff conclude that "activities of the state and local governments collectively have typically run counter to an economically sound fiscal policy."[30]

The expenditures chosen for examination were "net income-increasing expenditures (a rough measure of the net additions by governments to the disposable cash income of the community)."[31] For 1933-39 these expenditures in the aggregate declined each year. They were therefore deflationary and indicated perverse cyclical behavior.

As a proxy for revenue behavior Hansen and Perloff chose to examine the state sales tax, in their words, the tax which weighs "most directly and heavily on consumption." They found steady increases in state sales tax col-

lections from 1931 to 1939, again indicating perverse cyclical behavior.

Four other studies of this period deserve particular attention. The first was done by Mitchell, Litterer, and Domar.[32] Their findings tended to support the perversity hypothesis with two important exceptions. First, they found lags in the response of state and local fiscal behavior to changes in economic activity. These lags moderated the decline from 1929 to 1932. Second, by disaggregating state from local behavior they found local governments to be more procyclical than state governments, concluding that the cyclical swings of local government expenditures are in rough conformance with those of the whole economy, while it appears that "state governments are in a much better position than local governments to maintain their scale of services in depression periods."[33]

An interesting aspect of the study was that the authors combined federal, state, and local surplus-deficit positions and while not actually obtaining a number to indicate the aggregate influence of the public sector, they implicitly suggested the appropriateness of such an aggregation.

In commenting on the work of Mitchell, Litterer, and Domar, Charles Hardy pointed out that the conclusions are based solely on the catastrophic decline of 1929-32. The recessions of 1921, 1924, 1927, and 1937 are ignored. Hardy went on to say that "this single episode, which was part of the most violent liquidation that had occurred in nearly 60 years, does not of course prove anything as to the typical relation between state and local finance and the phase of the business cycle."[34] He added that during periods of mild recession, "expenditures, borrowings, deficits, and construction activities of local governments do show a definite correlation with the fluctuation of business activity during the 20s, but it is an inverse correlation precisely the reverse of that alleged by the authors."[35] This finding led Hardy to question the validity of the perversity hypothesis during periods of mild recession.

James A. Maxwell's findings for the period 1920-48 supported the perversity hypothesis after 1929. However he also found that the effects of mild recessions were not discernible and that federal grants had not taken account of cyclical fluctuation.[36]

A study by Mabel Newcomer examined the period 1929-52 and found, in general, perverse behavior.[37] "The record of the past 30 years shows that state and local finances have tended to follow the trend of private business activity, with spending and borrowing rising in inflationary periods and declining in deflationary periods. The fluctuations tend to be more moderate, however, than those of the economy as a whole."[38] She explained this behavior by contending that both the revenues and expenditures of state and local governments are income inelastic and follow the cycle.

The first major debunking of the perversity hypothesis was put forth by Ansel M. Sharp in 1958.[39] Sharp used tax revenues as a percentage of spending to indicate the net additions to, or subtractions from, the national income stream during the 1930s. Based on this measure, he found state fiscal behavior to be countercyclical for the period. He also found that local behavior was only slightly perverse or at best neutral in character. An examination of debt behavior over the period yielded similar results.

James Maxwell questioned Sharp's conclusions on the grounds that Sharp was inconsistent in the way he treated grants-in-aid.[40] Sharp deducted state grants from local expenditures, thus counting as state expenditures both federal grants to states and state grants to locals. By counting in this way Sharp had placed the states in the most favorable position possible. Maxwell recalculated Sharp's data attributing all grant expenditures to the donor government and found evidence that after 1932, state governments behaved in a perverse manner. Maxwell also examined the period from 1947 to 1958 and concluded that "the postwar record, as well as the record for 1930-31, indicates that, in moderate downturns of economic activity, state and local finances operate somewhat countercyclically; they do *not* follow the swings of private business activity."[41] Note the change from Maxwell's original conclusion that their behavior was always perverse.

In general, studies of state and local fiscal behavior during the Depression of the 1930s found at least some evidence of perverse behavior. A number of the studies also found a

time lag between the change in economic activity and a change in state and local government behavior. Some of the studies found that during moderate economic downswings the time lags accounted for some countercyclical behavior.

Studies of the Period Since The Depression

In 1959, Baratz and Farr examined municipal finances and the business cycle.[42] After examining revenues, expenditures, and surpluses for municipalities for the years 1920-58, they concluded that

> . . . the evidence at hand confirms the orthodox view that municipal finance is fiscally perverse with respect to *major* swings in economic activity—it intensifies both protracted inflations and depressions. But because local finance moves up and down more slowly than GNP, it assists in the stabilization of minor recessions occuring during secular booms, and in the stabilization of minor upturns occuring during periods of long-run depression.[43]

Baratz and Farr attributed these compensatory effects to the lags in the response of local policymakers and argued that "it is doubtful whether the fiscal actions of municipalities can be made fully compatible to those that promote national economic stability."[44]

Sharp re-entered the perversity discussion in 1965[45] and again found that for the period 1949-61 state and local purchases and receipts "did not conform to a pro-cyclical pattern."[46] While expenditures rose in both phases of the cycle, revenues either fell or rose more slowly during contractions than during expansions, leading to increasing surpluses during expansions and decreasing surpluses or actual deficits during contractions.

Finally, in a detailed study of the fiscal behavior of state and local governments over the four cycles for the period 1945-61, Robert Rafuse found a general pattern of increasing stability.[47] Rafuse found growth in the size of the state and local sector to be the dominant secular trend. In examining deviations from the long-run trend, Rafuse found state and local government receipts "to have been more and more stabilizing with each succeeding cycle;" expenditures to be "more stabilizing during contractions than they were perverse during expansions;" and finally

> . . . when receipts and expenditures were considered together . . . these governments have been a significant factor in moderating the seriousness of the postwar recessions and in promoting recovery. During each expansion period state and local government finances have been expansionary, but their strongest expansionary thrust has tended to fall in the early stages of the expansion, with a tapering off appearing in the later stages of the boom.[48]

While in general these studies support the perversity hypothesis for the period 1933-39, they do not provide substantial evidence of perversity during the milder postwar cycles. The most sophisticated studies seem to suggest that rather than tending to stimulate cyclical fluctuation, state and local fiscal behavior has become more and more stabilizing in character—at least for mild fluctuations. According to these studies, the fiscal coordination problem appears to be minimal.

While the studies provide an indication of the fiscal behavior of state and local governments with respect to the business cycle, with the exception of the Rafuse study they do not provide the level of sophistication required in present day macroeconomic fiscal policy debates. In particular, they have ignored the concept of the balanced budget multiplier as well as the full employment gap.

The Balance Budget Multiplier And the Perversity Hypothesis

Macroeconomics teaches that in general, an increase in both revenues and expenditures of the same amount has an expansionary impact. Because of the balanced budget multiplier, the reduction in the income stream due to a tax increase is less than the expansion caused by an expenditure increase of an equal amount. A part of the increased taxes comes out of savings while all of the expenditures are added to the income stream. As a result, an expansion in both taxes and spending is not neutral, but

instead tends to stimulate the economy. Thus, simply examining changes in surplus or deficit positions of the government will not provide a complete picture of fiscal impact.

Three studies of state and local fiscal behavior have attempted to incorporate the balanced budget multiplier into their analyses. The first was the classic study of fiscal policy in the 1930s by E. Cary Brown.[49] While Brown concentrated on federal fiscal behavior, he included a state and local series as a part of the analysis. His analysis includes both the concept of the balanced budget multiplier and the idea that comparisons should be made at full employment. Brown found that:

> State and local governments' fiscal policy was expansionary through 1933, but decreasingly so. By 1934, it had fallen clearly below 1929 and remained in an almost neutral position throughout the rest of the period. The federal government's policies were little more than adequate in most years of the 30s to offset these contractive effects of state and local government.[50]

In 1964 Richard Musgrave appraised the fiscal behavior of the state-local sector in his examination of the full employment adequacy of fiscal policy for the period 1957-63.[51] Using the multiplier concept Musgrave incorporated the idea of fiscal leverage, a measure of the impact of fiscal behavior on the change in GNP. He compared the change in fiscal leverage from peak to trough and from trough to peak with the change in GNP which would have occurred had the leverage not changed. A percentage change in GNP which may be attributed to fiscal activity is thus derived.[52]

Based on this model, Musgrave found that the state-local fiscal system offset the decline in GNP by 35% in the 1957-III to 1958-I recession and by 74% in the 1960-II to 1961-I recession. It also retarded the 1958-I to 1960-II and 1961-I to 1963-I upswings by 15% and 3% respectively.[53]

Musgrave also calculates a lagged leverage measure finding that again for the two recessions, state and local fiscal behavior retarded GNP decline by 17% and 34% respectively. During the periods of recovery state-local behavior was negligible in fiscal impact.[54]

Although he finds countercyclical behavior, Musgrave does not applaud it, arguing that "in a period when the cycle does not fluctuate around full employment and leaves substantial unemployment even during the upswings, stabilizing effects in the upturn are undesirable."[55] By implication although state and local governments performed in a countercyclical fashion during the two periods of recovery, "good" fiscal behavior would have required them to make additions to, rather than subtractions from, the aggregate income stream. Unfortunately, he does not expand upon the extent of the addition to the income stream required by such "good" behavior.

Robert Rafuse also used a fiscal leverage measure in his examination of state and local fiscal behavior for the period 1947-64.[56] Estimating both instantaneous and lagged fiscal leverage he found that state and local governments stimulated the aggregate economy. However, the stimulation was greater during contraction than during expansion, with some tendency for state and local governments to move in a countercyclical direction in the later expansion periods.

Comparing the lagged leverage measure with the change in GNP which would have occurred if state and local governments had been neutral shows that state and local fiscal behavior was perverse during every expansion; it accounted for an average of about 10% of the rise in GNP and as such was a major factor in the strength of the expansion. During contractions state and local behavior was highly stabilizing and retarded declines in GNP during every postwar recession.

Rafuse estimated fiscal leverage at the full employment level of income in an attempt to separate built-in from discretionary behavior and isolate discretionary policy actions.[57] Again his major finding was stabilization during postwar recessions.

The three studies using the balanced budget multiplier tend to reinforce the conclusions of the earlier studies which used revenues, expenditures, and surpluses. Evidence of perversity was found from 1933 to 1936. For the period since World War II, state and local governments were found to be strongly countercyclical in impact during recessions. During expansions, they were found to be mildly procyclical, accelerating the recovery.

The "New Fiscal Policy" and Perversity

Since the level of surplus (deficit) of a given budget program is determined by both automatic changes resulting from changes in economic activity and discretionary changes resulting from changes in tax rates, interpretations of economic significance may require that these two changes be separated. Examining the surplus or deficit at full employment allows one to distinguish these differences. The concept of the full employment surplus has three principal purposes:

1) to educate the public about fiscal policy;
2) to evaluate past fiscal policy; and
3) to serve as a guide for current analysis and policy prescription.[58]

As a measure of federal fiscal policy, it has received wide acceptance; the federal full employment surplus has been published by the Council of Economic Advisers in the *Economic Report of the President* since the early 1960s.

In 1974, the council began publishing a state-local full employment surplus and a combined full employment surplus for the public sector.[59] In 1977 the practice of summing the two accounts was abandoned and separate accounts were published for the state-local operating surplus or deficit (excluding social insurance funds.)[60] The only justification given for including the state and local sector on a full employment basis was provided *ex post* by Robert Vogel. He argued that since the size of the state-local sector is growing relative to the federal sector and federal grants-in-aid to state and local governments are increasing, "it is clear that greater attention should be paid to the implications of the behavior of state and local receipts and expenditures for macroeconomic activity and for federal stabilization policy."[61]

Table A-1 shows the actual and full employment surplus and the combined federal, state and local position for the years 1969-73. For the years 1969-72, the full employment surplus of state and local governments increased while that of the federal government declined. Based on what would have happened had the economy been at full employment, it may be argued that the behavior of the state and local sector reduced the stimulative impact which would have otherwise been generated by federal fiscal policy. From 1972 to 1973 state and local governments reduced their full employment surplus while the federal government moved from a deficit to a surplus position. While the combined shift was toward restraint, the shift is less than it would have been with just the federal government alone. Based on this data, it may be argued that state and local behavior was "perverse" with respect to federal behavior for the 1969-73 period. In each year the state-local, full employment surplus moved in the opposite direction from that of the federal government.

While these findings are of interest, there are a number of problems with the concept of the full employment surplus as applied to the state and local sector when used to measure fiscal coordination.[62] The problems are both technical and conceptual in nature. The first concerns the assumptions underlying the calculation of the full employment surplus. The obstacle which must be overcome is that of estimating full employment receipts. Two steps are required. First, the tax base for each of the four major categories of state-local receipts must be estimated at full employment. The next step is to apply the actual tax rates for each of the four categories to the estimated full employment bases. The initial assumption is that state and local tax rates do not vary systematically with changes in the tax base.

In a study of the relationship between the size of the full employment gap and state-local tax rates, Vogel noted that state and local receipts are maintained even when actual GNP falls short of potential GNP. He concluded that state and local tax rates vary systematically with the size of the GNP gap. The implication of this finding is that the larger the GNP gap, the greater the difference between actual tax rates and the tax rates which would have been in effect at full employment. Correcting for this bias, Vogel re-estimated state-local full employment receipts for the period 1955-73. His results are shown in *Table A-2*.

Vogel agrees with the previous studies that "increases in the gap between actual and potential GNP do tend to reduce state and local receipts."[63] However, he goes on to argue, "the present findings also reveal that state and local governments raise their tax rates in an effort to offset shortfalls in receipts when actual GNP

Table A-1

ACTUAL AND FULL EMPLOYMENT FEDERAL, STATE AND LOCAL GOVERNMENT RECEIPTS AND EXPENDITURES, NATIONAL INCOME ACCOUNTS BASIS, CALENDAR YEARS 1969-73

(billions of dollars; seasonally adjusted annual rates)

	Federal Government			State and Local Government			Combined surplus or deficit (—)
Calendar year	Receipts	Expenditures	Surplus or deficit(—)	Receipts	Expenditures	Surplus or deficit(—)	
Actual:							
1969	197.3	189.2	8.1	119.7	119.0	0.7	8.8
1970	192.0	203.9	—11.9	135.0	133.2	1.8	—10.1
1971	198.9	221.0	—22.2	152.3	148.3	4.0	—18.1
1972	228.7	244.6	—15.9	177.2	164.0	13.1	—2.8
1973[1]	265.4	264.7	.6	194.8	183.8	11.0	11.6
1972: I	222.9	236.6	—13.8	166.2	157.8	8.4	—5.4
II	225.4	244.4	—19.0	175.9	160.8	15.2	—3.9
III	229.6	237.0	—7.4	175.3	165.9	9.5	2.0
IV	236.9	260.3	—23.4	191.2	171.6	19.6	—3.8
1973: I	253.6	258.6	—5.0	190.2	176.4	13.9	8.9
II	262.4	262.4	.0	192.8	181.2	11.5	11.6
III	269.5	265.6	4.0	196.0	185.7	10.4	14.3
Full employment[2]							
1969	198.4	189.6	8.8	119.9	119.0	.9	9.7
1970	206.7	202.7	4.0	140.4	133.2	7.2	11.2
1971	216.5	218.6	—2.1	159.5	148.3	11.2	9.1
1972	234.9	242.6	—7.7	182.5	164.0	18.5	10.8
1973[1]	269.5	263.7	5.8	198.0	183.8	14.2	20.0
1972: I	230.2	234.3	—4.1	173.0	157.8	15.2	11.1
II	232.6	242.3	—9.7	181.6	160.8	20.8	11.1
III	236.6	235.0	1.6	180.5	165.9	14.6	16.2
IV	240.1	258.7	—18.6	195.0	171.6	23.4	4.8
1973: I	258.4	257.3	1.1	192.4	176.4	16.0	17.1
II	265.9	261.2	4.7	195.2	181.2	14.0	18.7
III	272.4	264.6	7.7	198.8	185.7	13.1	20.8

Note: Detail may not add to totals because of rounding.

[1]Preliminary.

[2]Overwithholding of personal income taxes is not included in full employment receipts.

SOURCE: *Economic Report of the President,* Washington, DC, U.S. Government Printing Office, 1974, p. 80.

Table A-2

ESTIMATES OF THE FULL EMPLOYMENT SURPLUS—FEDERAL GOVERNMENT, STATE AND LOCAL GOVERNMENTS, AND TOTAL GOVERNMENT SECTOR, 1955-73

	Federal			State and Local			Total		
	Receipts	Expenditures	Surplus	Receipts	Expenditures	Surplus	Receipts	Expenditures	Surplus
1955	70.7	68.1	2.6	31.4	32.7	—1.3	102.1	100.8	1.3
1956	77.6	71.9	5.7	34.9	35.6	—.7	112.5	107.5	5.0
1957	85.3	79.3	6.0	38.7	39.5	—.8	124.0	118.8	5.2
1958	89.2	86.9	2.3	42.9	44.0	—1.1	132.1	130.9	1.2
1959	96.2	90.2	6.0	47.0	46.8	.2	143.2	137.0	6.2
1960	106.2	92.0	14.2	51.1	49.6	1.5	157.3	141.6	15.7
1961	110.4	100.4	10.0	55.2	54.1	1.2	165.6	154.5	11.1
1962	115.1	109.4	5.7	59.7	57.6	2.1	174.8	167.0	7.8
1963	123.0	112.9	10.1	64.6	62.2	2.4	187.6	175.1	12.5
1964	120.3	117.5	2.8	70.3	67.8	2.5	190.6	185.3	5.3
1965	125.5	123.2	2.3	75.7	74.5	1.2	201.2	197.7	3.5
1966	140.3	142.9	—2.6	84.7	83.9	.8	225.0	226.8	—1.8
1967	153.6	163.6	—10.0	93.4	95.1	—1.7	247.0	258.7	—11.7
1968	176.0	181.7	—5.7	106.7	107.5	—.8	282.7	289.2	—6.5
1969	198.4	189.6	8.8	119.8	119.0	.8	318.2	308.6	9.6
1970	206.7	202.7	4.0	137.4	133.2	4.2	344.1	335.9	8.2
1971	216.4	217.9	—1.5	155.2	148.8	6.4	371.6	366.7	4.9
1972	232.4	242.7	—10.3	179.3	164.9	14.4	411.7	407.6	4.1
1973	265.9	263.1	2.8	194.6	184.4	10.2	460.5	447.5	13.0

Note. All figures are in billions of dollars. Federal full employment estimates are from the Council of Economic Advisers. State and local full employment expenditures equal actual expenditures.

SOURCE: Vogel, *op. cit.*, p. 34.

fails to reach potential so that state and local governments are in fact actively cyclically perverse,"[64] adding that the way to correct this perverse tendency is to provide federal grants to state and local governments when GNP falls short of potential.

The second problem with using the full employment surplus concept at the state and local level is the assumption concerning expenditures. In order to calculate the full employment surplus, expenditures are assumed to be exogenous. They are not affected by the full employment gap and actual expenditures are assumed to be equal to expenditures at full employment. A number of public finance scholars would question the assumption that expenditures are independently determined. Rather they would argue that expenditures also vary with the level of GNP and excluding these variations result in an incorrect estimate of the full employment surplus position.

In discussing the validity of the full employment surplus for state and local governments, Edward Gramlich has argued that

> . . . unlike the federal budget where some items (defense spending) are determined independently of aggregate demand and others (taxes) not, for the state and local sector the entire budget will be in part determined by aggregate demand. If there is a cyclical boom which generates an unanticipated state and local budget surplus, these governments will try to cut taxes or to spend more, and neither adjustment seems any more endogenous than the other. The Council of Economic Advisers may rule that property tax revenue changes are more endogenous than changes in spending for office supplies and only adjust the revenue side of the budget for cyclical factors, but their logic is not very compelling.[65]

The third technical criticism involves the lack of multipliers and the problems caused by inflation in interpreting the magnitude of the full employment surplus.

The full employment surplus does not take into account the fact that a given change in expenditures has a greater impact on the economy than a similar change in taxes. A number of economists have called for replacing the full employment surplus measure with a weighted full employment surplus where the expenditure and tax multipliers serve as the weights.[66]

In addition, the full employment surplus concept does not allow for changes in price levels. With rapid inflation the full employment surplus tends to overstate the real surplus. While a number of adjustments have been suggested to correct for this problem, none have been adopted and consistently used in the calculation of the full employment surplus.[67]

The final technical problem concerns interpretation of the full employment surplus. While it is supposed to show what the surplus or deficit would be if the economy were at full employment, the magnitude and even the sign may be different when the economy is well below full employment, making the information provided by this concept of very limited interest. For example, as Blinder and Solow have pointed out,

> Suppose the tax regulations are altered when the economy is very far below full employment. The revenue yield of this change at actual income levels may well be very different from the hypothetical revenue yield at full employment. Even the sign may be different. Consider, for example, a small reduction in personal income tax rates coupled with a very large increase in corporate tax rates. At low levels of business activity, with corporate profits depressed, this change might generate a net loss of revenues, even though at high levels of employment larger tax collections might result.[68]

The major conceptual issue is that of functional responsibility. For those who believe that the federal government alone should be concerned with stabilization policy, only at the federal level is there a need for a tool to evaluate such policy. If one believes as Gramlich does that "the state and local sector should no more be included in this evaluation [of stabilization policy] than should the corpo-

rate, household, or foreign sectors,"[69] then calculating such a measure for state and local governments makes little sense. If state and local governments do not have this responsibility, then they should not be graded on how well they perform.

Other Methods of Estimating Impact

While not yet applied to the state and local sector, a number of other methods for measuring the impact of budgetary behavior on the economy have been suggested. In general, each of the methods is more sophisticated than its predecessor; each has its own weaknesses; and no single measure has been generally agreed upon as the "best." The most important of these refinements include the weighted, standardized, full employment surplus, which incorporates multipliers and purports to solve the problem of estimating fiscal impact at less than full employment, and Blinder and Goldfeld's method which measures both fiscal and monetary "overhang" or lags.[70]

One additional measure of fiscal influence is the unweighted standardized surplus as developed by Paul McCracken,[71] Saul Hymans, and J. Philip Wernette.[72] In general, these authors want to take the change in expenditures (less automatic stabilizers for Hymans and Wernette) and subtract any changes in revenues due to a change in tax rates. The result is a measure of the impact of the budget on the economy at the actual level of GNP. None of these measures has been applied to the state-local sector.

CONCLUSION

This appendix has examined past studies of the federal-state-local fiscal coordination issue. Two general conclusions stand out. First, recent empirical studies do not support the perversity hypothesis for state and local government fiscal behavior during periods of recession. Second, there is no single, agreed-upon best method for measuring federal-state-local fiscal coordination. Much more research is needed in this area before strong conclusions can be drawn regarding the role of the state-local public sector in national stabilization policy.

FOOTNOTES

[1]Alvin H. Hansen and Harvey S. Perloff, *State and Local Finance in the National Economy*, New York, NY, W. W. Norton and Co., 1944.

[2]*Ibid.*, p. 49.

[3]Elasticity is a comparative measure of responsiveness. The income elasticity of state and local revenues compares the automatic response of a change in revenues to a change in income. If the percentage change in revenues is greater than the percentage change in income, the tax is said to be income elastic. If the percentage change in revenues is equal to the percentage change in income, the tax is said to be of unitary elasticity. Finally, if the percentage change in revenue is less than the percentage change in income, the tax is said to be income inelastic. The degree of elasticity is measured by dividing the percentage change in revenues from existing rates by the percentage change in income.

[4]For more detailed arguments, see Robert W. Rafuse, "Cyclical Behavior of State-Local Finances," in R. A. Musgrave, ed., *Essays in Fiscal Federalism*, Washington, DC, The Brookings Institution, 1965, pp. 65-6.

[5]For a counter interpretation, see James M. Buchanan, *Public Finance in Democratic Process*, Chapel Hill, NC, University of North Carolina Press, 1967, pp. 267-75.

[6]Victor Zarnowitz, "The Business Cycle Today: An Introduction," in V. Zarnowitz, ed., *The Business Cycle Today*, New York, NY, Columbia University Press, 1972, p. 2.

[7]For the classic work in this area, see Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles*, New York, NY, National Bureau of Economic Research, Columbia University Press, 1946. Some scholars would argue that both of these two methods—even the whole concept of the classical business cycle—are no longer relevant to today's economy. They would prefer to examine "growth cycles" which define the cycle in terms of periods of slow growth and periods of rapid growth rather than periods of absolute decline v. periods of absolute increase as is done in classical cycle studies. For an example of this point of view, see Ilse Mintz, "Dating American Growth Cycles," in V. Zarnowitz, ed., *The Business Cycle Today*, *op. cit.*, pp. 39-88.

[8]Rafuse, *op. cit.*, p. 69.

[9]For a discussion of this change, see Michael E. Levy, *Fiscal Policy, Cycles and Growth*, New York, NY, The

National Industrial Conference Board, 1963, pp. 7-14.

[10]R. A. Gordon, "The Stability of the U.S. Economy," in M. Bronfenbrenner, ed., *Is the Business Cycle Obsolete?*, New York, NY, John Wiley & Son., 1969, pp. 4-5.

[11]For the general flavor of this debate, see M. Bronfenbrenner, ed., *ibid.* It should be noted that a part of this debate is definitional rather than substantive. One of the problems is whether or not growth cycles and business cycles are the same thing.

Mintz, "Dating American Growth Cycles," *op. cit.*, argues that the two concepts are not the same. Gordon, *op. cit.*, p. 4, on the other hand, argues that growth cycles are in effect business cycles. He contends that:

> If swings in rates of growth are regular (but not necessarily periodic) and if these swings are of roughly the same duration and are associated with many of the same phenomena (such as cyclical changes in interest rates, the balance of trade, cost-price relations, and unemployment) as was true of past fluctuations that were called business cycles, then I should be inclined to say that these "growth cycles" should be called "business cycles." *The issues for policy are the same* if retarded growth (rather than an absolute decline in output) leads to a rise in unemployment—or if inflationary pressures resulting from accelerated growth force governments to impose fiscal and monetary restraints that, hopefully, will merely retard the rise in output and employment rather than bring on a decline in absolute levels. I am prepared to include cycles in growth rates in my definition of business cycles as long as they display the cumulative and pervasive features mentioned in my original definition and if their duration falls within the time limits that have customarily been thought of in connection with business cycles.

Geoffrey Moore, *op. cit.*, p. 42, in his comments on Gordon's discussion, points out the difference in policy alternatives which may be drawn upon depending upon which side of this debate one takes.

> From the viewpoint of business-cycle policy, the concept of a rate-of-growth cycle needs to be examined carefully. A mere reduction in the rate of growth of aggregate economic activity may not warrant an antirecession policy. The slower rate may be more sustainable than the faster one, and more compatible with price-level stability. Moreover, in U.S. experience, shifts from a rapid rate of expansion to a slower one have often occurred shortly after recovery from an absolute decline has begun. This decline in the rate of growth is associated with absorption of idle capacity, re-employment of workers previously laid off, attainment of a full workweek, and so on. Slower growth, in these circumstances, does not call for additional stimulation.
>
> Similarly, when the rate of decline during a contraction in activity gives way to a smaller rate of decline, this should surely not be taken as a signal that antirecession policies should be relaxed. In short, a cycle defined as an alternation of algebraically higher and lower rates of growth does not have simple implications for policy.

[12]Walter W. Heller, *New Dimensions of Political Economy*, Cambridge, MA, Harvard University Press, 1966, pp. 1-2.

[13]*Ibid.*, p. 62.

[14]Levy, *op. cit.*, pp. 59-60.

[15]For a discussion of these techniques and their differing results, see *ibid.*, pp. 59-81.

[16]Gordon, *op. cit.*, p. 27.

[17]R. A. Musgrave, "On Measuring Fiscal Performance," *Review of Economics and Statistics*, Vol. 46, Amsterdam, Netherlands, North-Holland Publishing Co., May 1964, p. 214.

[18]*Economic Report of the President*, Washington, DC, U.S. Government Printing Office, 1977, pp. 52-56.

[19]Bert G. Hickman, *Growth and Stability of the Postwar Economy*, Washington, DC, The Brookings Institution, 1960, p. 215.

[20]Stanley Engerman, "Regional Aspects of Stabilization Policy," in R. A. Musgrave, ed., *Essays in Fiscal Federalism*, Washington, DC, The Brookings Institution, 1965, p. 7-62.

[21]Robert B. Bretzfelder, "Sensitivity of State and Regional Income to National Business Cycles," *Survey of Current Business*, Washington, DC, U.S. Government Printing Office, Apr. 1973, pp. 22-27.

[22]Donald Ratajezak, "Cyclical Responsiveness in the South," *Atlanta Economic Review*, Atlanta, GA, University of Georgia, Jan./Feb., 1977, pp. 8-14.

[23]Joseph A. Ziegler, "Interurban Cycle Differentials and Fiscal Behavior," *National Tax Journal*, Vol., XXV, No. 1, Lancaster, PA, National Tax Association, Mar. 1972, pp. 91-95.

[24]For a discussion of grant stimulation or substitution effects, see Advisory Commission on Intergovernmental Relations, *Federal Grants: Their Effects on State-Local Expenditures, Employment Levels, Wage Rates*, A-61, Washington, DC, U.S. Government Printing Office, Feb. 1977.

[25]James A. Maxwell, "Countercyclical Role of State and Local Governments," *National Tax Journal*, Vol. XI, No. 4, Lancaster, PA, National Tax Association, Dec. 1958, pp. 371-76.

[26]Alan S. Blinder and Robert M. Solow, "Analytical Foundations of Fiscal Policy," *The Economics of Public Finance*, Studies of Governmental Finance, Washington, DC, The Brookings Institution, 1974, p. 8.

[27]*Ibid.*, p. 12.

[28]For an excellent summary of these early studies, see Robert W. Rafuse, *State and Local Fiscal Behavior Over the Postwar Cycles*, unpublished dissertation, Princeton University, Princeton, NJ, Nov. 1963, pp. 1-45.

[29]Hansen and Perloff, *op. cit.*

[30]*Ibid.*, p. 49.

[31]*Ibid.*

[32]George W. Mitchell, Oscar F. Litterer, and Evsey D. Domar, "State and Local Finance," *Public Finance and Full Employment, Postwar Economic Studies, No. 3*, Washington, DC, Board of Governors of the Federal Reserve System, Dec. 1945, pp. 101-30.

[33]*Ibid.*, p. 119.

[34]Charles O. Hardy, "Comments," *Public Finance and Full Employment, Postwar Economic Studies, No. 3*, p. 146.

[35]*Ibid.*, p. 146-147.

[36]James A. Maxwell, *Federal Grants and the Business Cycle*, New York, NY, National Bureau of Economic Research, Columbia University Press, 1952.

[37]Mabel Newcomer, "State and Local Financing in Relation to Economic Fluctuations," *National Tax Journal*, Vol. III, No. 2, Lancaster, PA, National Tax Association, June 1954, pp. 97-109.

[38]*Ibid.*, pp. 97-98.

[39]Ansel M. Sharp, "The Counter-Cyclical Fiscal Role of State Governments During the Thirties," *National Tax Journal*, Vol. XI, No. 2, Lancaster, PA, National Tax Association, June 1958, pp. 138-145.

[40]Maxwell, "Countercyclical Role of State and Local Governments," *op. cit.*, pp. 371-76.

[41]*Ibid.*, pp. 375-76.

[42]Morton S. Baratz and Helen T. Farr, "Is Municipal Finance Fiscally Perverse," *National Tax Journal*, Vol. XII, No. 3, Lancaster, PA, National Tax Association, Sep. 1959, pp. 276-84.

[43]*Ibid.*, pp. 283-84.

[44]*Ibid.*, p. 284.

[45]Ansel M. Sharp, "The Behavior of Selected State and Local Government Fiscal Variables During the Phases of the Cycles 1949-1961," *Proceedings of the Fifty-Eighth Annual Conference on Taxation*, National Tax Association, New Orleans, LA, National Tax Association, Nov. 8-12, 1965, pp. 599-614.

[46]*Ibid.*, p. 607.

[47]Rafuse, in R. A. Musgrave, ed., *Essays in Fiscal Federalism, op. cit.*, pp. 63-121. For more detailed analysis, see Robert W. Rafuse, *State and Local Fiscal Behavior Over the Postwar Cycles, op. cit.*

[48]*Ibid.*, pp. 117-18. Rafuse also uses a leverage measure which will be examined in more detail in the next section.

[49]E. Cary Brown, "Fiscal Policy in the 'Thirties:' A Reappraisal," *The American Economic Review*, Vol. 46, No. 5, Nashville, TN, American Economic Association, Dec. 1956, pp. 857-79.

[50]*Ibid.*, p. 867.

[51]Musgrave, *Review of Economics and Statistics, op. cit.*, pp. 213-20.

[52]*Ibid.*, p. 214. Note that Musgrave is calculating the value of leverage at actual income levels. He is not calculating changes in leverage at full employment levels of income. He is including both built-in and discretionary changes as a part of fiscal leverage.

[53]*Ibid.*, p. 215. There appears to be a typing error in Musgrave's table on this page. For the 1957-III to 1958-I recession only 16% is credited to the state-local sector. Using the data present in the article, it appears that 35% is the correct amount.

[54]*Ibid.*, p. 215.

[55]*Ibid.*, pp. 214-15.

[56]Rafuse, in R. A. Musgrave, ed., *Essays in Fiscal Federalism, op. cit.*, pp. 109-12. His measure is similar to that of Musgrave, but slightly simpler. He uses the formula:

IFL = (1/1-c) (G + aR - jT) where

IFL = instantaneous fiscal leverage
c = marginal propensity to consume
G = government purchases of goods and services
a = marginal propensity to consume of the recipients of transfer payments
R = dollars of transfer payments
j = marginal propensity to consume of taxpayers
T = tax receipts.

Note, it is the *change* in IFL which measures economic stimulus.

[57]*Ibid.*, pp. 112-15.

[58]For an examination of these purposes, see Warren L. Smith, "Comments by Discussants," in W. Lewis, ed., *Budget Concepts for Economic Analysis*, Studies of Government Finance, Washington, DC, The Brookings Institution, 1968, pp. 129-34.

[59]*Economic Report of the President*, Washington, DC, U.S. Government Printing Office, Feb. 1974, pp. 80-1.

[60]*Economic Report of the President*, 1977, *op. cit.*, pp. 76-7.

[61]U.S. Congress, Joint Economic Committee, Robert C. Vogel, "The Responsiveness of State and Local Receipts to Changes in Economic Activity: Extending the Concept of the Full Employment Budget," *Studies in Price Stability and Economic Growth*, Papers Nos. 6 and 7, 94th Cong., 1st Sess., Washington, DC, U.S. Government Printing Office, June 30, 1975, p. 21.

[62]*Ibid.*, pp. 21-35.

[63]*Ibid.*, p. 35.

[64]*Ibid.*, p. 35.

[65]U.S. Congress, Joint Economic Committee, Edward M. Gramlich, "Comments on Vogel's 'The Responsiveness of State and Local Receipts to Changes in Economic Activity: Extending the Concept of the Full Employment Budget,'" *Studies in Price Stability and Economic Growth*, Papers Nos. 6 and 7, 94th Cong., 1st Sess., Washington, DC, U.S. Government Printing Office, June 30, 1975, pp. 37.

[66]For an example of this position, see Edward M. Gramlich, "Measures of the Aggregate Demand Impact of the Federal Budget," in W. Lewis, ed., *op. cit.*, pp. 110-27.

[67]Blinder and Solow, *op. cit.*, pp. 27-32.

[68]Blinder and Solow, *op. cit.*, p. 17.

[69]Gramlich, *op. cit.*, p. 37.

[70]For a discussion of these methods, see Blinder and Solow, *op. cit.*, pp. 21-36; and Alan S. Blinder and Stephen M. Goldfeld, "New Measures of Fiscal and Monetary Policy, 1958-73," *The American Economic Review*, Vol. 66, No. 5, Nashville, TN, American Economic Association, Dec. 1976, pp. 780-96.

[71]Paul W. McCracken, "Moving Toward External and Internal Economic Balance," paper presented to the Southwestern Economic Association Convention, San Antonio, TX, Mar. 31, 1972, processed.

[72]Saul H. Hymans and J. Philip Wernette, "The Impact of the Federal Budget on Total Spending," *Business Economics*, Vol. 5, Washington, DC, National Association of Business Economists, Sep. 1970, pp. 29-34.

Appendix B

The Impact of State and Local Budgets on The Economy: Estimating Fiscal Leverage

Leverage was chosen to measure fiscal impact primarily because it is simpler and more comprehensive than most other measures. As developed by Musgrave,[1] the concept follows directly from a simple form of a Keynesian macroeconomic model. It is an all-inclusive measure in the sense that it incorporates taxes, transfers, and expenditures and includes both discretionary and nondiscretionary fiscal policy. Moreover, its relatively simple computation combined with its dependence on published data sources make it easy to verify the resulting findings. In particular, the parameters involved in the dynamics of leverage are easily identified, consisting of consumption multipliers and lag weights, and while there may be some debate over the particular *a priori* values chosen, parametric sensitivity analysis can resolve some of these questions.

Most other measures tend to be either too simple or too complicated for the purpose of this study. Both the actual surplus and the unweighted full employment surplus, for example, ignore the generally recognized balanced budget multiplier concept, treating both taxes and expenditures as having equal weight in terms of their impact on the economy. Thus these simple measures can be misleading and at times even show incorrect direction in terms of impact.[2]

The more complicated, weighted, full employment measures, used in some studies of the national economy (Musgrave, Brown, Rafuse), all deal specifically with discretionary policy, ignoring automatic stabilizing effects which need to be included in our measure of overall impact. Moreover, attempts at separating discretionary from nondiscretionary changes in taxes, expenditures, and the like, while desirable from a theoretical point of view, are extremely difficult from a practical point of view, especially with regard to state and local governments. Robert Vogel contends, for example, that budgetary limitations may make state and local government tax rates themselves dependent on economic conditions.[3] Besides this practical criticism, the full employment concept has come into increasing theoretical criticism because it does not accurately reflect fiscal impact during periods of cyclical fluctuations where employment is substantially below (or above) full employment.[4]

As opposed to using a single measure such as leverage, some economists have used large-scale general equilibrium models for the purpose of studying the impact of federal fiscal policy upon the economy.[5] That approach was not taken here because the models appear to have had difficulties in dealing with the state-local sector.[6]

ESTIMATING FISCAL LEVERAGE

The basic leverage formula used in our study is the same as that used by Rafuse.[7]

$$L = (1/1-mpc) \times (G+aR-bT)$$

G: government expenditures
R: transfer payments
T: tax collections
mpc: average marginal propensity to consume
a: mpc for recipients of transfer payments
b: mpc for taxpayers

The estimated fiscal impact of state and local budgets on the economy is equal to the *change* in leverage resulting from the change in G, R, and T, where mpc, a, and b are assumed to remain constant. The change in leverage can be shown to be similar to a multiplier process.

$$\Delta L = \Delta G(1/1-mpc) + \Delta R(a/1-mpc) + \Delta T(-b/1-mpc)$$

The change in leverage resulting from a change in government expenditures, for example, is computed using both the observed discretionary change in expenditures (ΔG) as well as any corresponding automatic changes in transfers and taxes (ΔR and ΔT) which are observed to have occurred in response to the change in income. Each of these changes is then multiplied by their respective multiplier weights. Again following Rafuse, we initially chose to let mpc = .5, a = .7, and b = .5. Musgrave calculated leverage assuming these weights to be closer to one, i.e., mpc = .83, a = .9, b = .8. The sensitivity of the results of this study, tested over a range of alternative assumed parametric values, is demonstrated later on in this appendix.

This simple leverage formulation can be made more sophisticated in order to account for the "real" impact on the economy by deflating the various components. The formula proposed by Brown[8] deflates the first round of government expenditures by the deflator for state and local government purchases of goods and services, while secondary effects of expenditures, as well as all effects of tax and transfers, are deflated by the personal consumption deflator. The formula for real leverage, RL, then becomes

$$RL = G/P_1 + (1/1-mpc) \times (mpcG + aR - bT)/P_2$$

P_1 = implicit price deflator for S-L purchases
P_2 = implicit price deflator for personal consumption

which may also be expressed as:

$$RL = 1/(1-mpc) \times (G+aR-bT)/P_2 + C.F.$$

where C.F. is a correction factor for different inflation rates:

$$C.F. = G/P_1 - G/P_2$$

Another adjustment is required to take into account the dynamic nature of the multiplier process. The change in real leverage represents the ultimate addition to real GNP resulting from current fiscal behavior, but there is no guarantee that all of the effect occurs immediately. On the contrary, one would normally expect a lagged effect of some kind. Blinder and Solow indicate that of the major macroeconomic models, all achieve at least half of the total multiplied effect by the end of the first quarter following a change in government expenditures.[9] We used the type of lag structure proposed by Musgrave and used by Rafuse[10] for lagged leverage (LL) in the t^{th} quarter as follows:

$$LL_t = (1/2)L_t + (1/2)^2 L_{t-1} + \ldots + (1/2)^5 L_{t-4} \qquad t = 1, 2, \ldots n$$

This represents an exponential lag structure with a finite lag of four quarters. This length of time implies that most of the impact occurs within the first year following a fiscal change, one-half occurring within the first quarter.

Combining these two adjustments, the deflation and the lag, results in the following formulation for real, lagged leverage (RLL):

$$RLL_t = (1/2)RL_t + (1/2)^2 RL_{t-1} + \ldots + (1/2)^5 RL_{t-4}$$

This then becomes the most appropriate formula for estimating the fiscal impact of state and local government activity upon the economy in quarter t. Note that it is the *change* in RLL_t which estimates the budget's impact in

quarter t.

The next question concerns the selection of data sources for determining G, R, and T for state and local governments. Quarterly data on state and local fiscal activity, seasonally adjusted at annual rates, is available from the *Survey of Current Business*. Two additional adjustments may be desirable from a theoretical standpoint: (1) social insurance and government enterprise trust fund activity may be excluded from consideration, and (2) federal aid to state and local governments may be excluded.

The operation of government employee retirement systems and government enterprises may be excluded for two reasons. First, these activities tend to have fiscal patterns over time which are relatively independent of the general budget process. Pension funds should be theoretically independent of general funds and hence are to some extent outside the control of the state and local governments. Likewise, many government enterprises are largely self-sufficient, supported by user charges and sales to the private sector, hence they are also outside the fiscal control of state and local budgets.

A second and no less important reason for their exclusion is the unavailability of data in the form which would be most amenable for estimating their fiscal impact. Social insurance trust fund data are available on a quarterly basis in the National Income Accounts but are not reported on an accrual basis, which would be the appropriate basis for estimating fiscal impact. Trust fund interest earnings are mixed in the data with other interest payments and receipts since only net interest payments are reported on a quarterly basis. Likewise, only the surplus of government enterprises is reported on a quarterly basis, which is certainly inappropriate for the purposes of estimating fiscal impact.

The exclusion of these items was achieved operationally by defining state and local government expenditures to be equal to state and local purchases of goods and services. Transfer payments to persons had to be adjusted because they included pension benefit payments. These were subtracted from quarterly values for transfer payments by interpolating annual social insurance benefit payments data. Employee contributions for social insurance were subtracted from receipts.

The second adjustment, involving the exclusion of federal aid, was much more problematic but important nonetheless. For this study federal aid was subtracted from both expenditures and receipts. Based on historical trends, 70% of federal aid was subtracted from purchases of goods and services while 30% was subtracted from transfer payments.

Implicit in this procedure are three important assumptions: (1) federal aid moneys are considered as both federal expenditures and federal revenues, hence the state and local sector receives no credit for spending these funds or for raising them, (2) if the federal funds cause the state and local sector to either spend more from own funds than it would have done otherwise (stimulation), or spend less from own funds than it would have done otherwise (substitution), such stimulation or substitution is credited to state and local fiscal behavior, and (3) federal aid is assumed to have been spent the same quarter it is received.

DISAGGREGATING LEVERAGE

In order to gain further insight into the state and local sector fiscal impact on the economy, as well as the economy's impact on the state and local sector, the sector was disaggregated by state, and by state v. local. A new source of data was required for this purpose because the National Income Accounts (NIA) do not provide the state-local breakdown, nor any information on fiscal matters by state. The only source available for such a breakdown was *Census of Governments* data. This has two major disadvantages: (1) only annual, fiscal year data are available, and (2) Census information is broken down into different categories than those of the NIA data, causing comparability problems. Specifically, the Census data does not provide a break out of transfer payment data, though it does net out social insurance accounts. As an admittedly crude solution, the leverage formula was altered as follows:

$$L^* = (1/1-mpc) \times (G-bT)$$

where transfer payments, R, are included in the Census data under G. This formulation thus is different from L in that L^* assumes a = 1.0 as opposed to 0.7, resulting in somewhat larger leverage amounts.

A similar change was made in the real form of leverage, RL*. State-by-state estimates of real leverage (not lagged) were obtained by the following formula:

$$RL^* = (1/1\text{-mpc}) \times (G - bT)/P_2 + C.F.$$

Note that both G and T used in this formula are net of social insurance funds, government enterprises, and federal aid (see *Table B-1*).

Caution is recommended in interpreting the state-by-state estimates particularly in view of the fact that different states experience the business cycle at different times and in different intensities. This, in combination with the differing fiscal years and reporting practices, makes state-by-state comparisons potentially hazardous.

The state v. local breakdown, like the state-by-state breakdown, was computed using *Census of Governments* and *Governmental Finances* data. Thus the RL* formula is used except that one must disaggregate the intergovernmental aid flows between state and local units.[11]

Expenditures and taxes were computed for each sector as follows:

STATE SECTOR

G = Direct General Expenditure - Federal and Local Aid to State + State Aid to Local.

T = Own Source General Revenue.

LOCAL SECTOR

G = Direct General Expenditure - Federal and State Aid to Local + Local Aid to State.

T = Own Source General Revenue.

In the absence of the appropriate deflators, the national implicit price of deflators, P_1 and P_2 were used for all states and for both state and local sectors. This adds another reason for caution in comparison. (See *Table B-2* and *Chart B-1*)

THE PARAMETRIC SENSITIVITY OF LEVERAGE

In applying the concept of leverage to state and local finance, the fiscal multipliers one chooses to use in the formula will make a difference in the estimated impact. Likewise various assumptions concerning what revenues and expenditures should be included, as well as the time lag assumption, are also important in determining the final estimated impact. Hence leverage was computed under a variety of alternative assumptions and multipliers in order to assess the sensitivity of the results to changes in these parameters.

Alternative Multipliers:

1) from Rafuse[12] . . . . . $1/(1-\text{mpc}) = 2$, $a = .7$, $b = .5$

2) from Musgrave[13] . . . . . $1/(1-\text{mpc}) = 6$, $a = .9$, $b = .8$

3) case of no multipliers . . . $1/(1-\text{mpc}) = 1$, $a = 1$, $b = 1$ [expenditures, taxes, and transfers are all equally weighted]

Alternative Assumptions:

1) including or excluding federal aid
2) including or excluding social insurance accounts
3) actual taxes or full employment taxes
4) instantaneous or lagged
5) real or nominal

Since the number of combinations using the alternatives above is large, not every combination was tested and only a few will be presented here.

The leverage estimates in *Table 5* resulted from the use of Rafuse's multipliers. They were lagged, real, excluding social insurance accounts, and computed for actual revenues, with and without federal aid. In *Table B-3*, the change in leverage is shown for three sets of multipliers. In other respects they are identical—real, lagged leverage, excluding social insurance, including federal aid, and computed using actual taxes. The set of multipliers labeled "Musgrave" is a simplified version of Musgrave's more detailed formulation in which separate tax categories had different multipliers: i.e., corporate tax multiplier = .5, other taxes multiplier = .9. From this table one can observe that the multipliers do indeed make a difference. On the whole, the "Musgrave" multiplier formulation, M, yielded the largest estimated stabilization impact, while as expected the no multiplier case, N, yielded the smallest.[14] With the exception of the 1949-53 ex-

pansion, the "Rafuse" formulation, R, was between M and N in terms of economic stimulation. *Charts B-2 and B-3* show the quarter-by-quarter stimulation provided by Rafuse's and Musgrave's multipliers respectively.

The next table (*Table B-4*) illustrates the sensitivity of leverage to the inclusion or exclusion of social insurance accounts and federal aid, where all other factors are held constant. Here, one can see by comparing A (includes aid) with X (excludes aid) that the inclusion of aid adds somewhat to the economic stabilization, more during expansion than during contraction. The inclusion or exclusion of social insurance accounts does not seem to make much difference (A v. AS).

Other variations of the leverage measure are shown in *Table B-5*. IR represents instantaneous leverage, computed using the "Rafuse" multipliers. In this case no lag was postulated and all of the leverage impact is credited during the quarter in which the fiscal activity takes place. The results roughly parallel those obtained using lagged leverage (R). The "full employment" leverage generated a little less stabilization than leverage using actual tax revenues, as was expected. Finally, combining the "full employment" and "no multiplier" concepts (FN), it is estimated that state and local governments provided stabilization during four of the last six recessions. The fact that even under these conservative assumptions the leverage impact is stabilizing during most recessions suggests that the sensitivity of leverage to parametric uncertainty does not call into question our conclusion rejecting the perversity hypothesis for the period studied.

The sensitivity to various multipliers does, however, lead one to note that the magnitude of estimated stabilization during recession depends to a large degree on which multipiers are used. The stabilization also seems to have varied quite a bit from one recession to another—using Musgrave's multipliers, stabilization ranged from 33.2% (1957-58) to 77.5% (1969-70). This variability makes federal intergovernmental stabilization policy difficult to formulate since it must be coordinated with the expected stabilization from the state and local sector.

Table B-1

TOTAL CHANGE IN REAL STATE-LOCAL LEVERAGE, BY STATE,[1] 1957-75

(millions)

States	During Recessions (Peak-Trough)[2]				During Expansions (Trough-Peak)			
	FY 1957-FY 1958	FY 1960-FY 1961	FY 1970-FY 1971	FY 1974-FY 1975	FY 1958-FY 1960	FY 1961-FY 1970	FY 1971-FY 1974	FY 1975[3] FY 1976
United States	$6,199	$5,930	$12,449	$15,457	$2,073	$41,397	$—10,529	$2,010
State	3,210	2,930	9,220	9,270	—650	23,350	400	—1,772
Local	2,990	3,000	3,222	6,190	2,720	18,050	—10,930	3,872
Alabama	—27	76	45	215	147	383	50	128
Alaska	—32	87	1,243	30	55	—842	217	—295
Arizona	53	131	150	128	26	252	227	97
Arkansas	28	3	—1	186	53	392	—236	76
California	711	1,136	682	1,151	1,000	4,888	—1,215	1,244
Colorado	87	31	168	268	23	341	96	85
Connecticut	170	—22	301	229	—369	815	—478	—269
Delaware	89	—21	63	34	—25	260	—171	31
Dist. of Columbia	104	73	24	45	9	160	—209	112
Florida	190	45	672	1,285	283	1,330	45	—182
Georgia	108	78	108	382	—51	1,193	—357	157
Hawaii	N.A.	47	55	176	N.A.	641	—111	—183
Idaho	7	12	—25	134	9	140	—1	—5
Illinois	873	485	1,139	1,354	—206	754	—828	411
Indiana	47	102	114	273	146	651	—515	185
Iowa	24	198	33	120	50	428	—257	173
Kansas	—54	73	—42	104	—124	360	—74	197
Kentucky	36	240	—217	236	35	583	—204	118
Louisiana	227	36	451	238	—132	220	—486	469
Maine	2	14	54	114	19	162	—137	—51

Maryland	58	121	414	451	—86	1,152	157	442
Massachusetts	—349	115	320	324	—17	1,393	—94	—731
Michigan	245	248	309	1,155	—205	1,983	—206	—340
Minnesota	199	6	38	199	—41	1,143	—364	344
Mississippi	26	66	15	119	267	197	—130	155
Missouri	34	161	169	265	57	1,001	—628	—88
Montana	—1	44	25	84	—13	65	—74	52
Nebraska	12	35	56	285	87	145	—32	—220
Nevada	10	30	55	50	23	191	3	22
New Hampshire	—17	12	47	64	—5	152	—20	45
New Jersey	—86	181	496	404	—13	1,749	128	43
New Mexico	—8	39	—6	123	75	98	—90	244
New York	1,405	523	3,553	466	—13	6,642	—1,370	—1,384
North Carolina	201	97	56	340	—95	877	—101	500
North Dakota	14	14	—35	39	55	8	—47	162
Ohio	381	12	212	1,095	18	1,645	—838	784
Oklahoma	—30	—17	108	41	23	375	—136	51
Oregon	137	107	—14	229	—20	439	35	156
Pennsylvania	356	—286	398	1,040	805	2,803	—1,075	112
Rhode Island	27	59	28	69	—23	174	—70	0
South Carolina	—2	85	—31	221	—55	546	243	4
South Dakota	1	18	36	72	1	86	—100	42
Tennessee	161	—2	142	366	126	739	—61	—76
Texas	301	299	368	708	—19	1,520	—268	587
Utah	49	80	16	79	—2	214	28	57
Vermont	36	11	42	—4	—15	98	—49	—9
Virginia	254	226	145	362	—166	853	338	—186
Washington	74	273	355	11	—105	1,047	—538	—178
West Virginia	5	47	—10	—24	—5	275	—45	182
Wisconsin	85	488	230	192	71	800	—247	217
Wyoming	21	21	10	55	9	43	—11	22

[1]Leverage is deflated, but not lagged. For details on this variant of leverage, see section on disaggregating leverage.
[2]Fiscal year peaks and troughs were chosen to include BEA cycle dates.
[3]The last expansion is incomplete as of FY 1977.

SOURCE: ACIR computations.

Table B-2

LEVERAGE IMPACT ON ECONOMY, SEPARATED INTO STATE AND LOCAL ORIGINS, 1957-75

During Recessions

Contraction (Peak-Trough)	Change in Real Leverage (billions)			Percent Contraction Intensified by		
	State and Local[1]	State	Local	State and Local	State	Local
FY 1957-FY 1958	$ 6.20	$ 3.21	$ 2.99	—21.8%	—12.6%	—11.9%
FY 1960-FY 1961	5.93	2.93	3.00	—40.3	—25.0	—25.4
FY 1970-FY 1971	12.45	9.22	3.22	—50.9	—43.4	—21.2
FY 1974-FY 1975	15.46	9.27	6.19	—15.9	—10.2	— 7.1

During Expansions

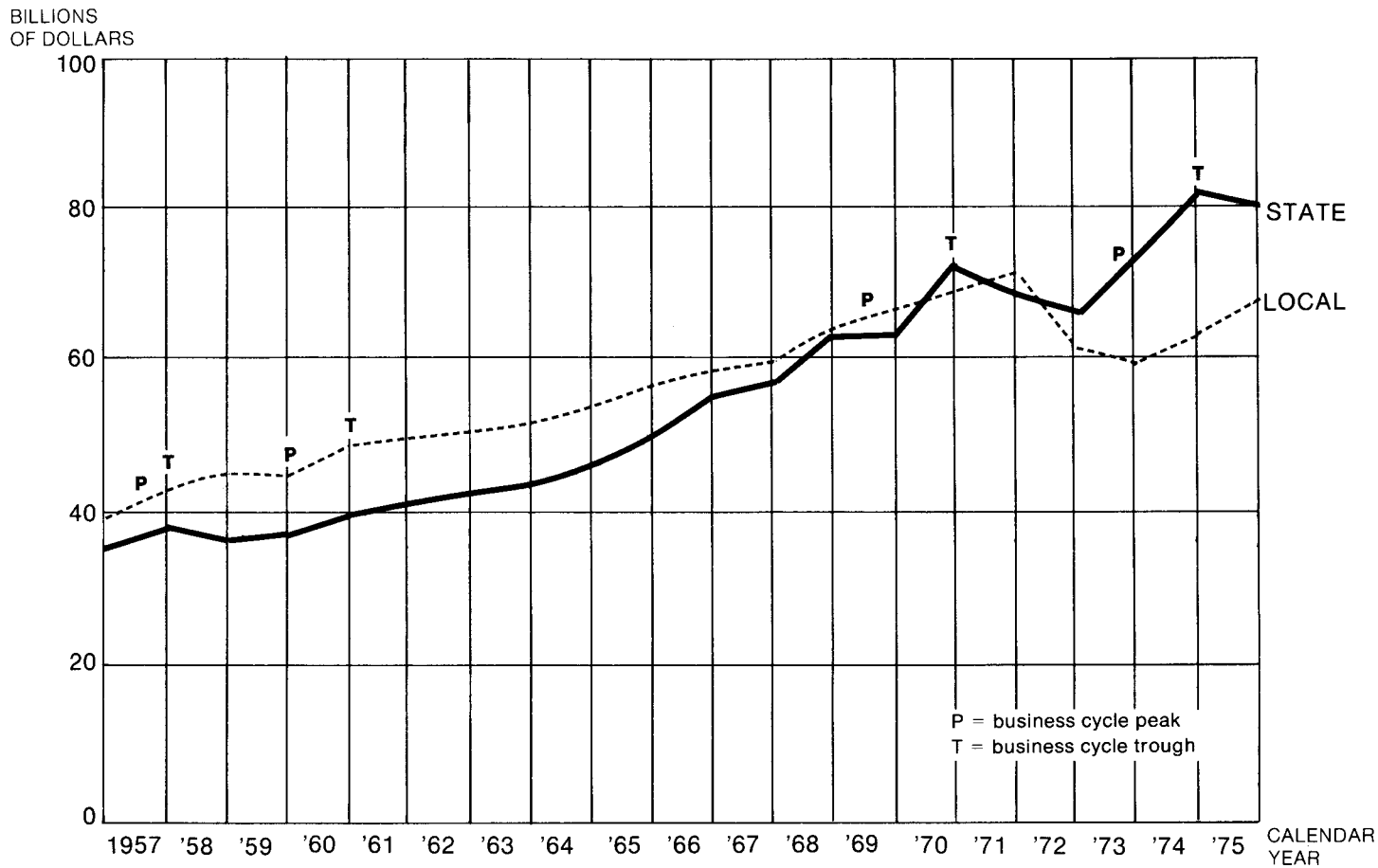
Expansion (Trough-Peak)	Change in Real Leverage (billions)			Percent Expansion Accelerated by		
	State and Local[1]	State	Local	State and Local	State	Local
FY 1958-FY 1960	$ 2.07	$—0.65	$2.72	2.8	—0.8	3.7
FY 1961-FY 1970	41.40	23.35	18.05	13.4	7.1	5.4
FY 1971-FY 1974	—10.53	0.40	—10.93	—5.8	0.2	—6.0
FY 1975-FY 1976[2]	2.01	—1.77	3.78	3.3	—2.7	6.3

[1]Discrepancies between this column and column X in *Table B-4* are due to the use of fiscal year data and fiscal year turning points which only roughly coincide with the quarterly turning points. For a more complete explanation, see section on disaggregating leverage.
[2]The last expansion is still under way so interpreting this information is very difficult.

SOURCE: ACIR computations.

Chart B-1

REAL LEVERAGE[1]: STATE AND LOCAL (WITHOUT FEDERAL AID) 1957-76



[1]Disaggregation based on fiscal year, Census data, hence this leverage differs somewhat from state-local leverage based on quarterly BEA data.

SOURCE: *ACIR computations* based on U.S. Department of Commerce, Bureau of the Census, *Census of Governments 1957* and *Governmental Finances*, various years; Bureau of Economic Analysis, *Survey of Current Business*, various years.

Table B-3

SENSITIVITY OF ESTIMATED LEVERAGE IMPACT ON ECONOMY TO CHOICE OF MULTIPLIERS[1]

R = Multipliers used by Rafuse (2, .7, .5)
M = Multipliers derived from Musgrave (6, .9, .8)
N = Case of "no multipliers" (1, 1, 1)

During Recessions

	Δ Leverage (billions)			Percent Contraction Intensified		
Contractions	**R**	**M**	**N**	**R**	**M**	**N**
1948 IV-1949 III	$ 8.7	$19.5	$ 3.1	—55.9%	—74.0%	—31.0%
1953 II-1954 III	6.0	18.6	2.3	—22.7	—47.3	— 1.0
1957 IV-1958 I	4.7	11.1	2.2	—17.5	—33.2	— 9.1
1960 I-1960 IV	4.0	10.3	0.8	—32.5	—54.9	— 8.4
1969 III-1970 IV	11.9	41.3	2.7	—49.8	—77.5	—18.6
1973 IV-1975 I	14.7	51.0	10.7	—16.8	—41.3	—12.8

During Expansions

	Δ Leverage (billions)			Percent Expansion Accelerated		
Expansions	**R**	**M**	**N**	**R**	**M**	**N**
1949 IV-1953 II	$ 4.7	$—1.5	$—0.8	3.5%	—1.1%	—0.6%
1954 II-1957 III	15.0	33.0	2.9	23.2	70.2	3.8
1958 I-1960 I	6.5	0.3	0.1	9.2	0.4	0.1
1960 IV-1969 III	69.0	136.4	12.2	24.4	63.4	3.6
1970 IV-1973 IV	19.4	45.2	—1.1	12.8	35.9	—0.6
1975 I-1977 II	—0.5	—40.9	—9.8	—0.3	—20.2	—5.7

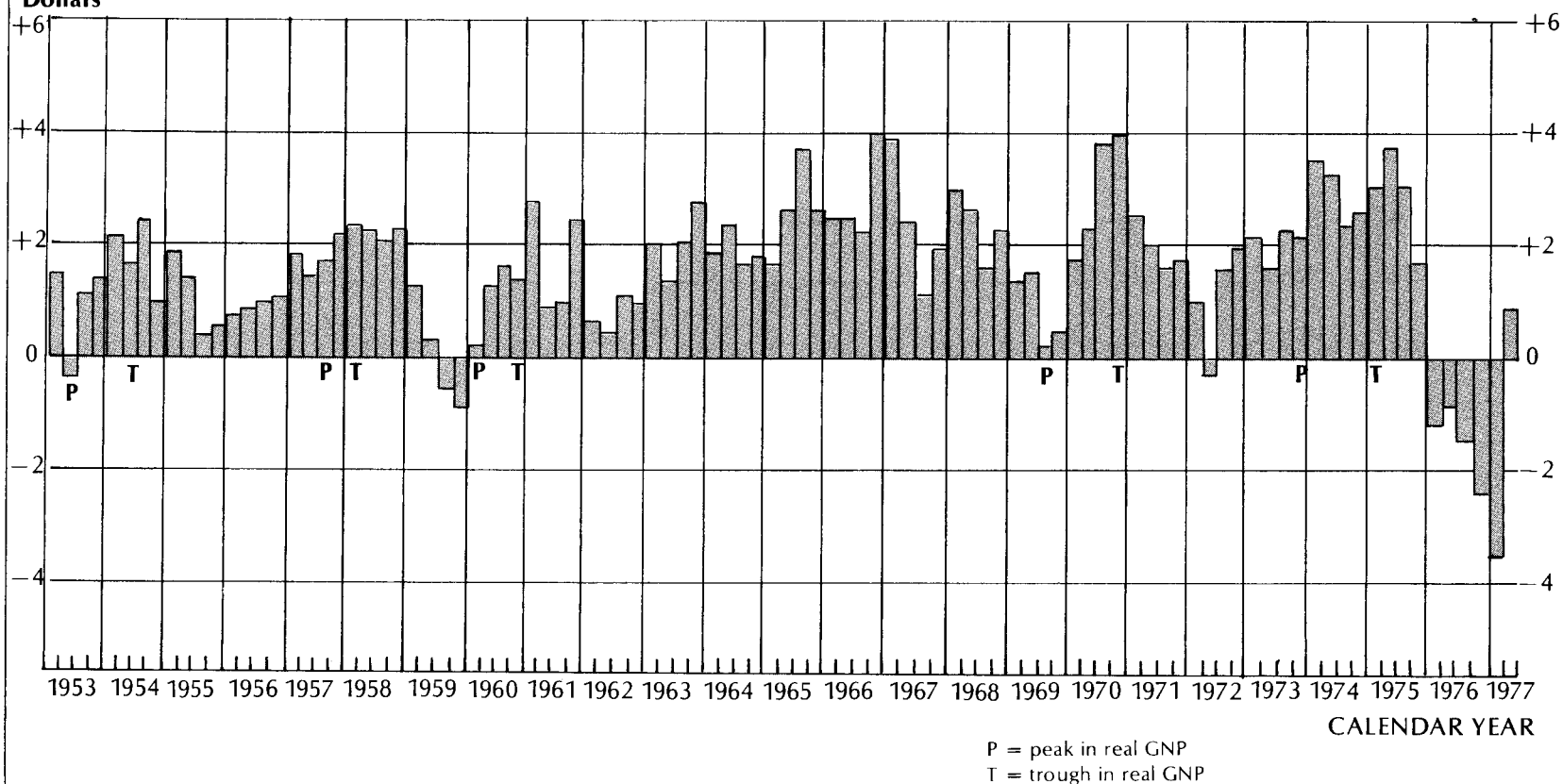
[1]In each case leverage is real, lagged, includes federal aid, excludes social insurance accounts, and is computed using actual revenues.

SOURCE: ACIR staff computations.

Chart B-2

LEVERAGE IMPACT USING "RAFUSE" MULTIPLIERS

QUARTERLY, 1953:1-1977:2
(billions)

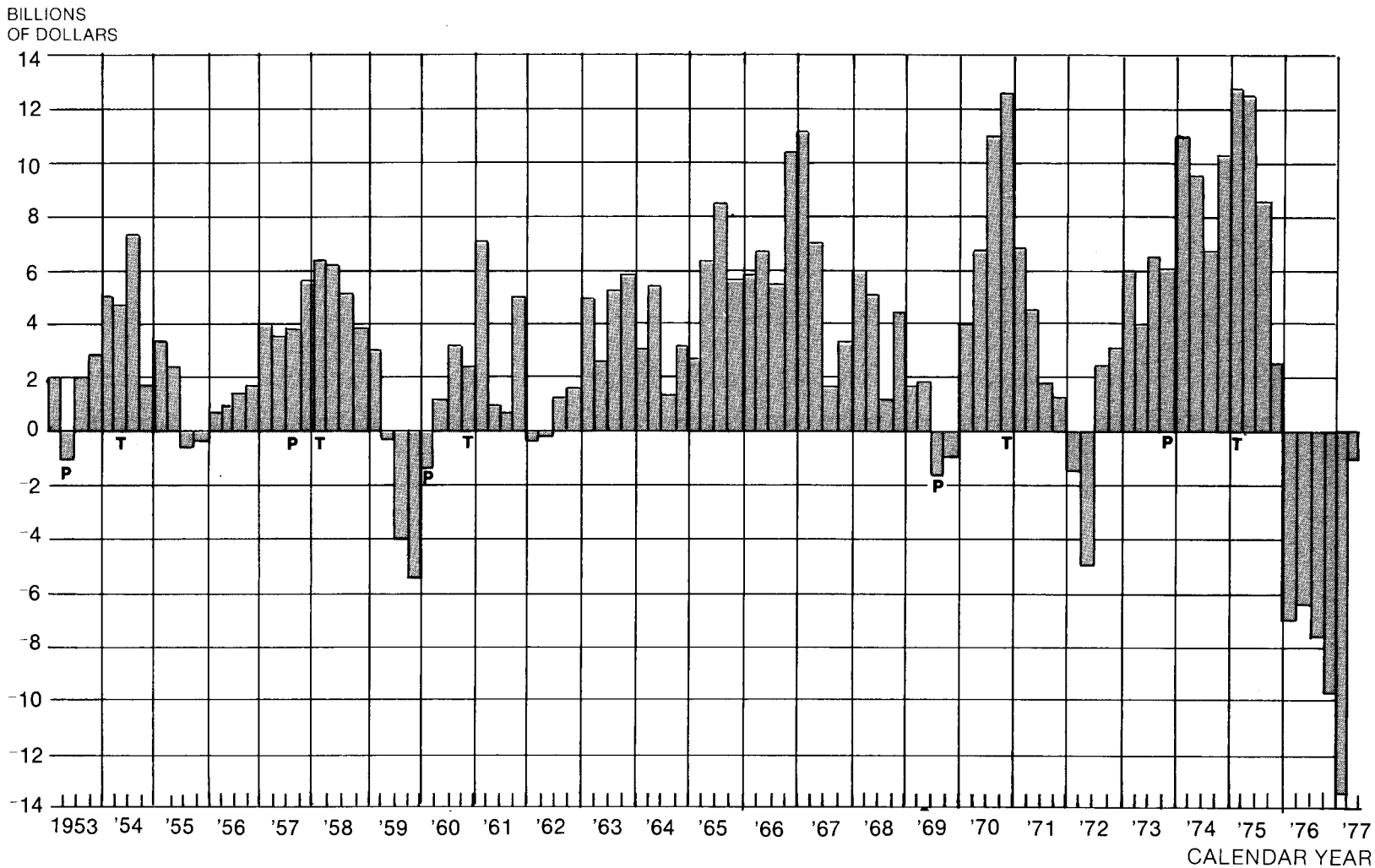


*Leverage includes federal aid, excludes social insurance transactions, is adjusted for inflation and time lags.

Source: ACIR staff compilations

Chart B-3

LEVERAGE IMPACT[1] USING "MUSGRAVE" MULTIPLIERS, QUARTERLY, 1953:1-1977:2 (Billions)



[1] leverage impact = Δ real lagged leverage, including aid, excluding social insurance.

Source: *ACIR calculations*

Table B-4

SENSITIVITY OF ESTIMATED LEVERAGE IMPACT ON ECONOMY TO INCLUSION OF FEDERAL AID AND SOCIAL INSURANCE ACCOUNTS[1]

A = includes aid, excludes social insurance
X = excludes aid, excludes social insurance
AS = includes aid, includes social insurance

During Recessions

Contractions	Δ Leverage (billions)			Percent Contraction Intensified		
	A	X	AS	A	X	AS
1948 IV-1949 III	$ 8.7	$ 7.9	$8.6	—55.9%	—53.7%	—56.0%
1953 II-1954 III	6.0	6.6	6.0	—22.7	—24.2	—22.0
1957 IV-1958 I	4.7	3.4	4.7	—17.5	—13.3	—18.0
1960 I-1960 IV	4.0	4.2	3.8	—32.5	—33.3	—31.0
1969 III-1970 IV	11.9	5.2	10.9	—49.8	—30.2	—48.0
1973 IV-1975 I	14.7	12.1	12.8	—16.8	—14.4	—15.0

During Expansions

Expansions	Δ Leverage (billions)			Percent Expansion Accelerated		
	A	X	AS	A	X	AS
1949 IV-1953 II	$ 4.7	$ 3.6	$ 3.9	3.5%	2.7%	2.7%
1954 II-1957 III	15.0	12.2	14.7	23.2	18.1	22.4
1958 I-1960 I	6.5	1.4	6.3	9.2	1.9	8.8
1960 IV-1969 III	69.0	44.6	63.9	24.4	14.5	22.2
1970 IV-1973 IV	19.4	0.1	18.4	12.8	0.1	12.0
1975 I-1977 II	—0.5	—11.4	—2.5	—0.3	—6.6	—1.5

[1]In each case leverage is real and lagged, and is based on actual revenue and Rafuse's multipliers.

SOURCE: ACIR staff computations.

Table B-5

ADDITIONAL VARIATIONS OF ESTIMATED LEVERAGE IMPACT[1]

IR = instantaneous leverage, "Rafuse" multipliers
FR = full employment leverage, "Rafuse" multipliers
FN = full employment leverage, "no multipliers"

During Recessions

	Δ Leverage (billions)			Percent Contraction Intensified		
Contractions	**IR**	**FR**	**FN**	**IR**	**FR**	**FN**
1948 IV-1949 III	$ 9.4	$ 7.0	$ 1.4	—57.9%	—50.4%	—16.5%
1953 II-1954 III	7.7	4.8	1.1	—27.1	—18.8	—4.8
1957 III-1958 I	5.5	3.7	1.2	—19.8	—14.1	—4.9
1960 I-1960 IV	5.0	3.2	—0.1	—37.3	—27.2	1.6
1969 III-1970 IV	15.4	8.5	—0.7	—56.2	—41.5	5.8
1973 IV-1975 I	15.5	7.5	1.7	—17.7	—9.4	—2.3

During Expansions

	Δ Leverage (billions)			Percent Expansion Accelerated		
Expansions	**IR**	**FR**	**FN**	**IR**	**FR**	**FN**
1949 IV-1953 II	$ 3.1	$ 6.6	$ 1.1	2.3%	5.0%	0.8%
1954 II-1957 III	15.0	15.0	2.9	23.1	23.2	3.7
1958 I-1960 I	4.6	7.0	0.5	6.4	10.0	0.7
1960 IV-1969 III	67.9	72.1	15.2	23.9	25.8	4.5
1970 IV-1973 IV	17.7	22.1	1.6	11.6	14.8	0.9
1975 I-1977 II	—2.4	0.8	—6.5	—1.5	0.5	—3.9

[1]In each case, leverage is real and includes federal aid, excludes social insurance accounts. The instantaneous leverage uses actual taxes. Full employment taxes were obtained by a two-step process: first, real own source general revenues were regressed on GNP/PGNP and on population, using a difference-in-logs specification and fiscal year data, from which the coefficient on the log of the ratio gap, GNP/PGNP, was found to be .6511 (See *Appendix C*). Following Vogel, full employment taxes were computed using the following formula:

$R_{FE} = R(1/GAP)^{.6511}$

R_{FE} = full employment revenues
R = actual revenues
GAP = GNP/Potential GNP

SOURCE: ACIR staff computations.

FOOTNOTES

[1]U.S. Congress, Joint Economic Committee, Testimony of Professor Musgrave on the *Economic Report of the President, 1962,* in *Hearings,* 87th Cong., 2nd Sess., Washington, DC, U.S. Government Printing Office, p. 461. Also, Richard A. Musgrave, "On Measuring Fiscal Performance," *Review of Economics and Statistics, 46, Amsterdam, Netherlands, North Holland Publishing Co., May 1964, pp. 220-31.*

[2]Alan S. Blinder and Robert M. Solow, "Analytical Foundations of Fiscal Policy," *The Economics of Public Finance, Studies of Government Finance,* Washington, DC, The Brookings Institution, 1974, pp. 11-20.

[3]U.S. Congress, Joint Economic Committee, Robert Vogel, "The Responsiveness of State and Local Receipts to Changes in Economic Activity: Extending the Concept of the Full Employment Budget," *Studies in Price Stability and Growth,* Papers Nos. 6 and 7, 94th Cong., 1st Sess., Washington, DC, U.S. Government Printing Office, 1975.

[4]Blinder and Solow, *op. cit.,* p. 23.

[5]Alan S. Blinder and Stephen M. Goldfeld, "New Measure of Fiscal and Monetary Policy, 1958-73," *American Economic Review,* Vol. 66, No. 5, Nashville, TN, American Economic Assoc., Dec. 1976, pp. 780-96.

[6]Charles R. Nelson, "Prediction Performance of the FRB-MIT-PENN Model of the U.S. Economy," *American Economic Review,* Vol. 62, No. 5, Nashville, TN, American Economic Assoc., Dec. 1972, pp. 902-17.

[7]Robert W. Rafuse, Jr., "Cyclical Behavior of State and Local Finances," in R. A. Musgrave, ed., *Essays in Fiscal Federalism,* Washington, DC, The Brookings Institution, 1965.

[8]E. Cary Brown, "Fiscal Policy in the 'Thirties:' A Reappraisal," *American Economic Review,* Vol. 46, No. 5, Nashville, TN, American Economic Assoc., Dec. 1956, p. 87.

[9]Blinder and Solow, *op. cit.,* p. 82.

[10]Rafuse, *op. cit.,* p. 108.

[11]For a discussion of the difficulties involved in assigning aid responsibility among the levels of government, see James A. Maxwell, "Countercyclical Role of State and Local Governments," *National Tax Journal,* Vol. XI, No. 4, Lancaster, PA, National Tax Assoc., pp. 371-76.

[12]Rafuse, *op. cit.,* p. 108.

[13]R. A. Musgrave, *op. cit.,* p. 213.

[14]One can tell from the tables at the end of the appendix whether state-local fiscal activity is stabilizing or not by referring to the percent impact columns entitled "percent contraction intensified," and "percent expansion accelerated." The formula used to compute this percent impact is as follows:

$$\text{percent impact} = [\,\Delta L/(\,\Delta \text{real GNP} - \Delta L)\,] \times 100$$

where L equals leverage. During recessions the change in real GNP is negative and in every case larger than ΔL in magnitude, so the denominator will be negative, representing the change in real GNP which we estimate would have occurred in the absence of state and local government influence on the economy. The percent impact is interpreted, therefore, as the percent by which state and local governments have altered the course of the recession. A negative percent impact during a recession implies that the numerator, ΔL, is positive in sign, indicating stabilization on the part of state and local governments. During an expansion, the denominator is expected to be positive, so a negative percent impact will result when ΔL is negative, indicating stabilization. Thus, during both expansion and contraction, stabilization is indicated by a negative sign.

The Impact of the Economy on State and Local Budgets: Regression Analysis

Revived interest in business cycles and the growing size of the state and local government sector has led to two related methods to measure the effect of the GNP gap upon state and local revenues; (a) The Council of Economic Advisers (CEA) method, and (b) the method developed by Robert Vogel to improve on the CEA approach.[1]

The CEA method employs a two-step procedure whereby full employment tax bases are first estimated for the various sources of state and local revenue. These tax bases are then multiplied by the estimated effective tax rate for each tax and summed to obtain the full employment revenue for state and local governments in the aggregate. The difference between estimated full employment revenue and actual revenue represents the revenue loss of state and local governments due to the recession.

Vogel claims that tax rates systematically vary over the business cycle, reflecting state and local government efforts to offset cycle induced changes in tax bases. Specifically, Vogel argues that during a recession the observed effective tax rate is greater than the full employment tax rate. Hence the CEA method, which uses the observed rate as a proxy for the full employment rate, overestimates full employment revenues during recession, leading to an overestimation of revenue loss. Vogel claims to have solved this problem by estimating full employment revenues directly from a time series regression analysis of state and local revenues. The equation regressed was in log-linear form with total state-local receipts as the dependent variable and time, the GNP deflator, and the GNP gap ratio as independent variables. Vogel's theoretical model is written as follows:

$$R = a(e)^{rt} (P)^{b1} (GAP)^{b2} u$$

where R = state and local government receipts
a = constant
t = time
P = GNP implicit price deflator
GAP = GNP gap ratio: the ratio of actual GNP to potential GNP
u = error term

Vogel's estimated coefficients were:

$\ln a = 3.04$ (220.3)
$r = 0.015$ (61.2)
$b_1 = 1.39$ (34.7)
$b_2 = 0.37$ (10.4)
$R^2 = .999$
Durbin-Watson statistic = 1.27

T values in parentheses

Adjusting these quarterly estimates for serial correlation, Vogel found the coefficients relatively unchanged. He then estimated the same

equation using fiscal year data. The results were practically identical and the Durbin-Watson statistic was 2.32. Vogel then estimated full employment receipts, $R_{(FE)}$, making use of the estimated GNP gap ratio coefficient as follows: $R_{(FE)} = R(1/GAP)^{b2}$.The revenue loss resulting from the GNP gap is therefore $R_{(FE)} - R = R(1/GAP)^{b2} - R$.

ESTIMATES OF STATE AND LOCAL REVENUE LOSSES DUE TO THE GNP GAP

A time series regression for the period from 1957 to 1976 was estimated to calculate the impact of the change in the GNP gap upon the change in state and local revenues. The dependent variable is the change in general revenues from own sources (not total state-local receipts as in Vogel's equation). A revised potential GNP series was used in determining the GNP gap variable[2] and the equation was estimated by fiscal year. Using fiscal year data instead of quarterly data eliminates much of the serial correlation problem and allows estimates by level of government and by region. The regression equation was estimated in "first difference" form as follows:

$$\Delta R = a + b_1 \Delta P + b_2 \Delta G$$

where:

- ΔR = change in own source general revenues (billions of dollars)
- ΔP = change in GNP implicit price deflator (in 1972, P = 1.0)
- ΔG = change in GNP gap (G = PGNP -GNP, in billions of dollars)

It is important to note that in this specification, Vogel's gap ratio was dropped in favor of the more conventional GNP gap measure, G = potential GNP minus actual GNP. Time is implicitly included in the constant term.

The estimated coefficient for the GNP gap was -.12 for state and local governments. The gap coefficient, b_2, for state government was -.08, twice that of local government, -.04. Since the gap coefficient for state revenues is twice that of local revenues while state revenues are only 20% larger than local revenues, it can be concluded that state own source revenues are almost twice as sensitive to the business cycle as local own source revenues (see *Table C-1*).

The coefficient on the change in the gap was then multiplied by the actual size of the gap for various years to obtain the revenue loss due to the GNP gap.[3] For example, the GNP gap

Table C-1

REGRESSION FOR REVENUE LOSS

Regression Equation	Parameter	Estimated Coefficient	T Value	Adjusted R Squared	Durbin-Watson Statistic
State-Local	b_1	236.4	11.29	.88	1.35
	b_2	—.1178	5.54		
	a	1.152			
State	b_1	141.2	10.31	.86	2.01
	b_2	—.0822	5.91		
	a	.3318			
Local	b_1	95.2	9.60	.86	.99
	b_2	—.0356	3.54		
	a	.820			

SOURCE: ACIR computations. Data sources are: revised quarterly data on the GNP implicit price deflator and GNP were obtained from the U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business;* revised quarterly data on potential GNP was provided by the Council of Economic Advisers. Quarterly data were averaged to get fiscal year data. Own source general revenue was obtained from U.S. Bureau of the Census, *Governmental Finances,* and *Census of Governments,* reported on a fiscal year basis.

Table C-2

ESTIMATED IMPACT OF THE RECESSION ON STATE AND LOCAL OWN SOURCE GENERAL REVENUE, FISCAL YEARS 1973-76

	Net Revenue Loss From Recession[1]	
	Amount (in billions)	Percent of Own Source General Revenue
State-Local		
1973	$(0.3)[2]	(0.2)%
1974	2.5	1.5
1975	16.0	8.8
1976	16.4	8.2
State		
1973	(0.2)	(0.2)
1974	1.8	2.0
1975	11.2	11.6
1976	11.4	10.6
Local		
1973	(0.1)	(0.1)
1974	0.8	1.0
1975	4.8	5.7
1976	4.9	5.3

[1]Net in the sense that revenue shortfalls offset by tax rate increases are not counted as a loss.
[2]Revenue gains from over-full employment are reported in parentheses.

SOURCE: ACIR computation based on regression analysis.

in fiscal year 1975 was $136 billion. The estimated state government revenue loss due to the recession was therefore 136 times .08, or about $11 billion in fiscal year 1975. Similar computations for selected years and different levels of government are presented in *Table C-2*. The losses are in nominal terms, which explains why the loss in fiscal year 1976 was larger than that in fiscal year 1975, the year containing the trough of the recession. In real terms the fiscal year 1975 loss exceeded fiscal year 1976 by over a half billion dollars.

ESTIMATES OF THE IMPACT OF INFLATION ON STATE AND LOCAL REVENUES

The same regression analysis was used to isolate the impact of inflation upon own source general revenues. In this instance, attention focuses on b_1, the coefficient for the price deflator, estimated to be equal to 141 for state government, 95 for local, and 236 for total state and local governments.[4] The state coefficient is some 48% higher than the local. About half of the difference between the estimated state inflation coefficient and the estimated local inflation coefficient is due to the fact that state governments have roughly 20% more revenue[5] subject to inflation than do local governments. The remaining part of the difference between the estimated coefficients indicates the relatively greater sensitivity of state revenue systems to inflation, compared to local revenue systems.

Table C-3

ESTIMATED IMPACT OF INFLATION ON STATE-LOCAL OWN SOURCE GENERAL REVENUES, FISCAL YEARS 1973-76

	Revenue Gain from Inflation	
	Amount[1] (in billions)	Percent of Own Source General Revenues
State-Local		
1973	$10.3	6.8%
1974	18.9	11.4
1975	28.4	15.7
1976	19.5	9.7
State		
1973	6.2	7.7
1974	11.3	12.7
1975	17.0	17.5
1976	11.6	10.8
Local		
1973	4.2	5.9
1974	7.6	9.9
1975	11.4	13.6
1976	7.8	8.4

[1]Calculated by the following formulae:

State-local revenue increase = (236.4) $(P_t - P_{t-1})$
State revenue increase = (141.2) $(P_t - P_{t-1})$
Local revenue increase = (95.2) $(P_t - P_{t-1})$
where $P_t - P_{t-1}$ = .044, .080, .120, and .082 for fiscal years 1973, 1974, 1975, and 1976, respectively.

SOURCE: ACIR computation based on regression analysis.

Multiplying the regression coefficient by the actual change in the deflator, ΔP, gives an estimate of the nominal addition to own source general revenue associated with inflation. These figures for fiscal years 1973 through 1976 are provided for each level of government in *Table C-3*.

Inflation also saps the purchasing power of the state-local tax dollars. A crude measure of the annual loss in purchasing power was calculated using the implicit price deflator for state and local purchases of goods and services, p_t. The percent decline in purchasing power is given by $X_t = 100(p_t - p_t\text{-}1)/p_t$. Multiplying nominal own source general revenues in year t by X_t therefore gives the nominal dollar loss in purchasing power for own source general revenues shown in *Table C-4*. These estimates reflect the decline in purchasing power only for own source general revenues which on the average represent 75% of state general revenue and 60% of local general revenues.

The purchasing power of state and local government expenditures not from own sources also declines during inflationary periods. This decline may be especially harmful for governments heavily dependent on federal aid flows which do not automatically increase with inflation. No attempt has been made to estimate the effect of inflation upon other than own source revenues. As a result, the total revenue loss resulting from the combination of recession and inflation may be expected to be higher than these loss estimates would indicate.

An additional reason for caution in interpreting the state-local breakdown in *Table C-4* is that the same deflator for state and local purchases was used for both sectors although inflation might be expected to affect the purchasing power of state revenues differently than local. Separate deflators, however, are not available.

Table C-4

ESTIMATED LOSS IN STATE-LOCAL PURCHASING POWER OF OWN SOURCE GENERAL REVENUES, FISCAL YEARS 1973-76

	Loss in Purchasing Power from Inflation	
	Amount (in billions)	Percent of Own Source General Revenues[1]
State-Local		
1973	$ 9.4	6.3%
1974	12.4	7.5
1975	18.5	10.2
1976	13.8	6.9
State		
1973	5.0	6.3
1974	6.7	7.5
1975	9.9	10.2
1976	7.4	6.9
Local		
1973	4.4	6.3
1974	5.8	7.5
1975	8.6	10.2
1976	6.4	6.9

[1]Equals $X_t = 100\ (p_t - p_{t-1})/p_t$; p_t = implicit price deflator for state and local purchases of goods and services.

SOURCE: ACIR computations, based on U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, and U.S. Bureau of the Census, *Governmental Finances*.

More on the Regression Analysis

The theoretical considerations involved in the specification of the model began with the premise that short-run fluctuations of own source revenues can be "explained" by a combination of long-run and short-run factors. The long-term component is based on population, income, and other factors lagged over a number of years, and represents the increment in the demand for public goods. In this model this demand is assumed to increase constantly over time.

The short-term component represents the "automatic" features of the tax structure—its responsiveness to short-term fluctuations in inflation and employment. Also included in the short-term component are statutory changes in tax rates necessitated by cycle-induced revenue shortfalls and surpluses. The short-term com-

Table C-5

OTHER REGRESSIONS TESTED

1. $\ln R = a + b_1 \ln P + b_2 \ln GAP + b_3 T$
2. $\Delta \ln R = a + b_1 \Delta \ln P + b_2 \Delta \ln GAP + b_3 \Delta \ln MOV$
3. $\Delta \ln(R/P) = a + b_2 \Delta \ln GAP + b_3 \Delta \ln POP$
4. $\Delta R = a + b_1 \Delta P + b_2 \Delta G + b_3 \Delta POP$
5. $\Delta R = a + b_1 \Delta P + b_2 \Delta G + b_3 \Delta LAGMOV$
6. $\Delta \ln R = a + b_1 \Delta \ln P + b_2 \Delta \ln GAP + b_3 \Delta \ln POP$
7. $\%\Delta R = a + b_1 (\%\Delta P) + b_2 (\%\Delta GAP)$
8. $\%\Delta R = a + b_1 (\%\Delta P) + b_2 (\%\Delta GAP) + b3 (\%\Delta POP)$

Variable Code:

R	=	own source general revenues (billions of dollars)
P	=	implicit price deflator for GNP (1972 = 1.0)
GAP	=	ratio GNP gap: GNP/potential GNP
G	=	nominal GNP gap: potential GNP — GNP
T	=	time period index (FY 1957 = 1, FY 1958 = 2, . . . FY 1976 = 20)
POP	=	population (millions)
MOV	=	three-year moving average of real own source general revenues
LAGMOV	=	moving average of three years preceding present year of real own source general revenues

SOURCES: Revenue data was obtained from U.S. Department of Commerce, Bureau of the Census, *Governmental Finances,* various years and is fiscal year data. Price and GNP data were averaged over four quarters to obtain fiscal year estimates; the source was the *Survey of Current Business,* July 1977. Potential GNP was averaged from quarterly data supplied by the Council of Economic Advisers.

Table C-6

ESTIMATED REGRESSION COEFFICIENTS*

Regression and level of government	a	b_1	(T-value)	b_2	(T-value)	b_3	(T-value)	$\bar{R}^2$	D.W.
(1) State and Local	3.84	.84	(5.51)	.52	(1.72)	.07	(12.3)	.99	.59
(1) State	3.23	1.13	(5.81)	1.18	(3.05)	.06	(9.41)	.99	.75
(1) Local	3.04	.53	(4.02)	—.13	(0.49)	.07	(14.6)	.99	.68
(2) State and Local	.00	1.08	(3.82)	.60	(2.96)	.95	(2.01)	.45	2.15
(2) State	.01	1.19	(3.64)	.95	(3.56)	.78	(1.95)	.48	2.40
(2) Local	—.01	1.11	(3.75)	.32	(1.72)	1.22	(2.84)	.46	2.05
(3) State and Local	.03	—	—	.65	(3.82)	1.77	(1.50)	.46	1.46
(3) State	.06	—	—	.96	(4.01)	0.29	(0.17)	.46	1.92
(3) Local	.01	—	—	.35	(2.85)	3.29	(3.17)	.44	1.35
(4) State and Local	2.07	229.8	(5.24)	—.11	(3.62)	—.31	(0.17)	.88	1.35
(4) State	2.43	126.2	(4.45)	—.07	(3.60)	—.70	(0.60)	.85	2.04
(4) Local	—.35	103.6	(5.01)	—.04	(2.74)	0.39	(0.47)	.85	1.01
(5) State and Local	.10	209.2	(7.49)	—.11	(4.79)	.41	(1.19)	.88	1.82
(6) State and Local	.07	.65	(1.48)	.46	(1.52)	.12	(0.05)	.28	1.52
(7) State and Local	7.46	.64	(2.86)	.49	(2.13)	—	—	.30	1.50
(8) State and Local	7.62	.63	(1.34)	.48	(1.40)	—.08	(0.03)	.26	1.51

*These coefficients correspond to the regression equations shown in *Table C-5.*

SOURCE: ACIR computation.

Table C-7

ESTIMATED RECESSION-RELATED REVENUE LOSS, BY STATE, FISCAL YEAR 1976

State and Region	Revenue Loss (millions)	Loss as Percent of Own Source General Revenue	T Value	$\overline{R}^2$	Durbin-Watson
***United States**	16,021	8.0	—	—	—
***New England**	1,313	12.5	—	—	—
Connecticut	415	16.3	2.65	.29	1.67
Maine	150	20.5	3.78	.58	2.64
Massachusetts	629	11.4	4.33	.74	1.17
New Hampshire	28	5.2	2.22	.90	0.93
Rhode Island	56	7.7	3.21	.71	1.15
Vermont	35	8.5	2.09**	.45	1.51
***Mideast**	4,628	10.6	—	—	—
Delaware	17	3.0	1.00**	.67	2.10
District of Columbia	77	11.3	3.14	.60	1.36
Maryland	436	11.5	4.42	.78	2.17
New Jersey	736	11.3	4.46	.71	0.93
New York	2,472	10.8	5.80	.84	1.95
Pennsylvania	890	9.7	2.47	.41	1.09
***Great Lakes**	2,685	7.9	—	—	—
Illinois	475	4.8	1.12**	.41	1.91
Indiana	55	1.3	.32**	.29	1.53
Michigan	1,042	12.7	4.58	.68	1.57
Ohio	631	8.3	3.62	.75	1.88
Wisconsin	482	11.6	3.75	.63	1.69
***Plains**	948	7.0	—	—	—
Iowa	137	5.8	3.14	.85	2.47
Kansas	149	8.4	2.81	.63	3.07
Minnesota	228	5.8	2.42	.76	1.29
Missouri	289	9.1	3.55	.64	1.90
Nebraska	98	8.0	3.67	.80	1.52
North Dakota	24	4.1	1.66**	.83	1.68
South Dakota	23	4.6	1.61**	.55	1.39

***Southeast**	2,963	9.2	—	—	—
Alabama	162	7.4	5.75	.93	1.67
Arkansas	139	12.2	5.36	.85	2.14
Florida	796	13.2	5.50	.82	.99
Georgia	289	8.3	3.45	.78	1.95
Kentucky	135	6.0	2.58	.82	2.51
Louisiana	235	8.0	3.57	.87	2.00
Mississippi	130	9.1	4.31	.84	1.93
North Carolina	299	8.8	5.15	.87	1.16
South Carolina	179	10.2	4.63	.87	1.87
Tennessee	272	10.6	4.76	.80	1.08
Virginia	280	7.7	4.01	.87	1.65
West Virginia	47	4.0	1.23**	.75	1.95
***Southwest**	1,057	8.1	—	—	—
Arizona	105	5.7	2.87	.90	2.33
New Mexico	15	1.6	.87**	.91	1.06
Oklahoma	125	6.8	4.15	.90	2.31
Texas	812	9.7	5.03	.92	1.26
***Rocky Mountain**	391	8.4	—	—	—
Colorado	210	9.5	5.29	.91	1.28
Idaho	28	4.8	1.97**	.84	1.90
Montana	51	8.2	2.18	.67	3.34
Utah	82	9.8	3.00	.73	2.11
Wyoming	20	5.3	1.20**	.76	1.00
***Far West**	1,751	6.2	—	—	—
California	1,078	4.8	1.95**	.78	2.09
Nevada	47	7.5	2.78	.76	1.92
Oregon	231	11.6	5.52	.90	2.87
Washington	175	5.4	3.29	.87	1.65
Alaska	178	32.5	0.32**	—.02	2.89
Hawaii	42	4.4	1.87**	.82	2.17

*Region totals are sums of individual states.
**Not significant at the .05 level.

SOURCE: ACIR staff calculations.

ponent was assumed to be related directly to inflation and the GNP gap.

While the results of the "first differences" form of the equation are highlighted in this report, there was no strong *a priori* reason for choosing this particular form. Hence, the equation was also tested in levels, logs, percent differences, and differences of logs. Other variables such as time, population, and moving averages of past revenues were employed in some of the regressions tested to specify more explicitly the long-run component. *Table C-5* lists some of the regression equations we estimated and *Table C-6* gives the regression results obtained.

The "difference" form was chosen on the basis that it appeared to avoid most successfully the problems of multicollinearity and serial correlation. The estimated coefficients were all "correct" in sign and conformed to reasonable expectations in their magnitude. In addition, the regression performed reasonably well when run on state and local sectors separately. Finally, the adjusted R square and the Durbin-Watson statistics did not rule out the model's use. Nonetheless, caution is in order in interpreting the results. In particular, the model requires the gap coefficient to be constant over time. This may lead to some specification error given that state and local tax structures have become more income elastic from 1957 to 1976.

Note that the dependent variable is not the same for each of these specifications. Thus one should be very careful in making comparisons based on the sign and size of the coefficients. The natural log specification (equations 1, 2, 3, and 6) and the percent change specification (equations 7 and 8), for example, yield elasticity-type estimates, as opposed to the slope estimates obtained from the first differences specification (equations 4 and 5). Similarly, comparing coefficients from equations differing only in the level of government examined is misleading in the case of the slope estimates (equations 4 and 5) because the scale of the dependent variable differs from one level of government to another.[6] In addition, the sign of b_2 is expected to be positive for regressions using the ratio gap (GAP) and negative for the nominal gap (G) because they are inversely related. The scale of the coefficients should also differ depending on which gap variable is used.

State-by-State Estimates of Revenue Loss

The "first differences" method was used to estimate own source revenue losses due to the recession, by state.[7] The results are reported in *Table C-7*, for fiscal year 1976.[8] It should be noted that the estimating equation worked for some states much better than for others, thus making state-by-state comparisons of revenue losses very difficult. However, it appears that some states were much more severely affected by the recession than others. For example, Michigan lost almost 13% of its revenues because of the recession in fiscal year 1976 while Washington State only had its revenues reduced by about 5%.

Targeting and Revenue Loss

Based on these estimates of recession-related revenue loss, by state, it is possible to examine the relationship between countercyclical aid and revenue loss. *Table C-8* reports the simple correlation coefficients showing this relationship. The correlation coefficient between countercyclical aid and revenue loss, by state, is .91, indicating a high association between those states having the greatest losses and those states receiving the greatest amount of countercyclical aid.

The Impact of Recession on State And Local Government Expenditures

Unlike own source revenues which automatically rise and fall with the business cycle, expenditures are expected to lag in their response to the business cycle since it takes time for governments to reduce planned expenditures. Some expenditures, however, may rise automatically during recessions, and fall during recoveries. In an attempt to test these hypothesized effects, a time series regression was computed using the change in total state and local expenditures as the dependent variable.

The independent variables hypothesized to influence the variation of total state and local expenditures consist of: (1) the current change in the GNP gap, (2) the change in the GNP gap for the previous year, and (3) the change in the GNP deflator for the previous year. The first term may be thought of as being related to

Table C-8

CORRELATION MATRIX: COUNTERCYCLICAL AID AND REVENUE LOSS, BY STATE, FISCAL YEAR 1976

	LOSS	POP	U	AID/POP	LOSS/POP
AID	.907	.924	.431	.128	.090
LOSS	—	.861	.373	.060	.207
POP	—	—	.252	—.139	—.001
U	—	—	—	.625	.314
AID/POP	—	—	—	—	.486

AID = ARFA, LPW, and CETA countercyclical funds, through December 1977.
LOSS = Revenue loss in FY 1976, from Table C-7.
POP = Population, July 1976.
U = Unemployment rate for year ending February 1977.
AID/POP = Per capita AID.
LOSS/POP = Per capita LOSS.

SOURCE: ACIR staff calculations.

automatic responses to the business cycle, and is expected to be positive. The second term reflects the lagged impact of a recession on expenditures and is expected to be negative. The deflator is lagged in the third term, implying that it takes time for cost increases to affect expenditures. The regression results are as follows:

$$\Delta EXP_t = .82 + \underset{(2.69)}{.06}\ \Delta G_t - \underset{(2.51)}{.08}\ \Delta G_{t-1} + \underset{(11.09)}{401.82}\ \Delta P_{t-1}$$

$$\bar{R}^2 = .96$$

$$D.W. = 1.90$$

Values for T statistics are in parentheses.

EXP = total state and local expenditures, billions of dollars.
G = GNP gap = potential GNP minus actual GNP, billions of dollars.
P = GNP implicit price deflator (for calendar year 1972, P = 1.0)
t = fiscal years: 1958-76

Quarterly data was converted into fiscal year equivalents.

The results indicate that recessionary GNP gaps in the past two decades appear to initially increase state and local expenditures (by a factor of 0.06 times the change in G) but in the following fiscal year expenditures tend to fall by a somewhat larger amount (-.08 times the change in G), other things being equal.

FOOTNOTES

[1]For an explanation of both methods, see U.S. Congress, Joint Economic Committee, Robert Vogel, "The Responsiveness of State and Local Receipts to Changes in Economic Activity: Extending the Concept of the Full Employment Budget," *Studies in Price Stability and Growth*, Papers Nos. 6 and 7, 94th Cong., 1st Sess., Washington, DC, U.S. Government Printing Office, 1975, pp. 21-35.

[2]Revised quarterly values for Potential GNP were obtained from the Council of Economic Advisers. These were then averaged for each fiscal year.

[3]In other words, the loss due to the recession is calculated by estimating the hypothetical change in revenues which would have occurred had the economy changed from full employment to actual employment in any given year, causing the GNP gap in dollars to change from zero to the actual GNP gap. This hypothetical change in the GNP gap is equal to the GNP gap itself.

[4]See *Table C-1*: Estimated Coefficient, and Source Note. The regression equation is explained in the accompanying text.

[5]"Revenue" refers to own source general revenues.

[6]It is interesting to note that the coefficients from the state and local regressions must add up to the total state-local regression coefficients under the first differences-type of specification (equations 4 and 5). This is because the independent variables are identical for each level of government and the dependent variable for the total state-

local sector is equal to the sum of the dependent variables for the state and local sectors.

[7]A regression was run for each of the 50 states and the District of Columbia. The dependent variable was total state-local own source general revenues of the given state (estimated in first differences form).

[8]Because of data limitations, the time period used for state-by-state estimates was one year shorter than that used for the United States as a whole. The period studied was 1958-76. This explains why the total United States revenue loss in *Table C-7* ($16.0 billion) is less than the estimate in *Table C-2* ($16.4 billion) for the fiscal year 1976.

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