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PAPERS NOS. 6 AND 7

THE IMPACT OF INFLATION ON THE FULL EMPLOYMENT BUDGET

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HUBERT H. HUMPHREY, Minnesota, *Chairman*
WRIGHT PATMAN, Texas, *Vice Chairman*

(II)

LETTER OF TRANSMITTAL

To the Members of the Joint Economic Committee:

Transmitted herewith for the use of the Members of the Joint-Economic Committee and other Members of Congress are two studies:: "Current Problems in the Full Employment Concept" by Nancy H. Teeters and "The Responsiveness of State and Local Receipts to-Changes in Economic Activity: Extending the Concept of the Full Employment Budget" by Robert C. Vogel. These studies were under--taken as part of the Committee's Inflation Study (S. Con. Res. 93, 2d session) to provide Members of Congress and the general public with a better understanding of the impact of inflation on the full employment budget.

The study, "Current Problems in the Full Employment Concept," by Nancy Teeters was stimulated by the general debate during the past few years about the usefulness of the full employment budget concept. In an introductory paper entitled "Shortcomings in the Full Employment Budget" Murray L. Weidenbaum outlines some of the criticisms which have been directed at the conventional calculation of full employment budgets in recent years. Mrs. Teeters' paper deals with these criticisms and suggests some changes which might be useful. Following her paper are comments by Professor Weidenbaum and Professor Robert Solow.

The second study, "The Responsiveness of State and Local Receipts to Changes in Economic Activity: Extending the Concept of the Full Employment Budget," by Robert C. Vogel is an attempt to improve the calculation of State and local full employment budgets as it has been presented in the 1974 and 1975 Economic Report of the President. Following Dr. Vogel's paper are comments by Dr. Edward M. Gramlich.

These papers were prepared under the general supervision of Mr. Douglas Lee of the Committee staff, with the assistance of other members of the Joint Economic Committee staff. The Committee is grateful to the experts who have given generously of their time in preparing the papers and comments. I would also like to express my own appreciation to the authors who prepared these studies.

The views expressed in these papers are those of the contributors and do not necessarily represent the views of the Joint Economic Committee or any of its individual Members.

HUBERT H. HUMPHREY,
Chairman, Joint Economic Committee.

CONTENTS

THE IMPACT OF INFLATION ON THE FULL EMPLOYMENT BUDGET

SHORTCOMINGS IN THE FULL EMPLOYMENT BUDGET

By MURRAY L. WEIDENBAUM*

The concept of the full employment budget as a measure of the absence of presence of fiscal restraint has come under increasing attack in recent years. The first point of controversy has been the assumption that universally underlies both the official and private computations of the full employment budget—that full employment is to be defined as 96 percent of the labor force, or an unemployment rate of 4 percent.

A more recent line of attack has been to recognize the role of inflation as increasing revenues faster than expenditures and thus to make attainment of a balanced full employment budget easier to achieve. A third and lesser known shortcoming relates to the exclusion of the new category of "off budget agencies" from the unified as well as the full employment budget computations. Numerous other shortcomings have been noted but are not covered in this paper.

THE UNEMPLOYMENT ASSUMPTION

Under present labor force conditions, it does not seem reasonable to expect that the American economy can achieve a 4 percent unemployment rate in peacetime short of unacceptable inflation. But the choice of unemployment assumption can be critical to determining whether the full employment budget registers a surplus or a deficit for any given time period. This is the case because revenues are far more sensitive than government spending to changes in the level of economic activity.

Using the traditional 4 percent assumption, the Federal budget for fiscal 1975, as estimated in the official budget, shows an estimated surplus of $8 billion. But at 4.5 percent unemployment, the full employment budget would register a $4 billion deficit. (See Table 1.) If "full employment" were defined at 4.8 percent—which might be a reasonable figure under present circumstances—the Government would be operating at an $8 billion full employment deficit.

Clearly, the higher the level of unemployment which is assumed to represent a relatively fully employed economy, the more difficult it is to achieve a balance of revenues and expenditures.

TABLE 1.—SOME ALTERNATIVE FULL EMPLOYMENT BUDGETS

[In billions of dollars]

Unemployment assumption	1975 full employment budget		
	Revenues	Expenditures	Surplus (+) or deficit (−)
Percent:			
4	311	303	+8
4.5	299	303	−4
4.8	296	304	−8

*Dr. Weidenbaum is Edward Mallinckrodt distinguished university professor at Washington University in St. Louis, Missouri.

THE PROBLEM OF INFLATION

A more recent line of attack on the usefulness of the present method of calculating the full employment budget follows from the recognition of the role of inflation in increasing revenues faster than expenditures. Thus a balanced full employment budget can be achieved rather easily— and not be too meaningful.

To simplify matters, we can use estimates in the January 1974 *Economic Report* that full employment revenues rise 1.1 percent for every one percent increase in inflation and that full employment expenditures rise only 0.5 percent, in the short run. This estimate of the income elasticity of revenues (the proportional increase in revenues in relation to a percentage increase in the GNP) is considerably lower than earlier estimates. Yet it is quite reasonable in view of the changing Federal tax structure. The rapid growth of social security taxes (with a relatively low income elasticity, in the neighborhood of 1) offsets the higher income elasticity of income taxes (usually estimated to be at least 1.2).

On the expenditure side, although many programs are "indexed" to overall price movements, they usually react with a lag. Thus in the short run an increase in inflation above that assumed in preparing the budget estimates generally will mean declining real outlays for many programs operating under relatively fixed appropriations.

On the assumption of a 7 percent rate of inflation for the year ahead, the Administration has estimated an $8 billion surplus in the full employment budget. But what would the full employment measure have looked like if inflation were held down to the more traditional rate of 3 percent? As shown in Table 2 revenues would be substantially less, and only a modest $2 billion surplus would be registered.

TABLE 2.—MORE ALTERNATIVE FULL EMPLOYMENT BUDGETS

[In billions of dollars]

Inflation assumption	1975 Full employment budget		
	Revenues	Expenditures	Surplus (+) or deficit (—)
Percent:			
7	311	303	+8
3	299	297	+2
0	290	292	—2

To see what the total effect of inflation is on the full employment budget concept, we can compute the figures that would result from no change in price levels—i.e., to convert this measure into "real" terms. A $2 billion deficit would replace the $8 billion surplus currently estimated for the full employment budget in the fiscal year 1975.

The purpose of this analysis is not to question the realism of the 7 percent inflation assumption actually used in the new Federal Budget. But we need to recognize the consequences of inflation: the more rapidly the level of prices increases, the smaller the deficit or the larger the surplus that is registered in this budget series. Thus grave doubt is cast over the validity of using the full employment budget numbers as presently computed as an indicator of fiscal restraint during a period of substantial inflation.

THE OFF-BUDGET AGENCIES

The phenomenon of the "off-budget" Federal agencies is of recent origin. The term was first introduced in January 1974 in the Federal Budget for the fiscal year 1975. It deserves some attention because it is weakening the effectiveness of both the unified budget and the full employment budget as comprehensive indicators of Federal finance.

First of all, this category does *not* include many items which would seem to fit the title. It does not cover the government-chartered enterprises, such as the Federal Land Banks and the Federal National Mortgage Association, which have become privately owned in recent years. Since 1967 when the Federal Government adopted the recommendations of the President's Commission on Budget Concepts, these privately owned albeit government-sponsored enterprises properly have been excluded from the Federal budget.

In contrast, this new category of "off-budget agencies" contains and is limited to enterprises which are entirely federally owned and controlled. That is, the "off-budget agencies" are truly part of the Federal Government. They generally are staffed by civil servants and subject to all other Federal operating procedures. The only thing that separates them from the agencies that are included in the budget is that Congress has passed laws which arbitrarily move their financial transactions out of the Federal budget.

The result is clear: the total of Federal expenditures and the resultant budget deficit are both lower than they would be if this arbitrary change had not occurred. It is noteworthy that when the Treasury reports the Federal Government's total borrowings from the public, the financial requirements of these off-budget agencies are added back in!

One characteristic that seems to accompany the achievement of "off-budget" status is that of expansion. For example, the first off-budget agency was the Export-Import Bank, which was excluded by statute as of August 17, 1971. In the fiscal year 1972, its lending totaled $249 million. The volume more than doubled to $630 million in 1973 and is estimated to exceed $1.3 billion in 1975. This upward trend is in striking contrast with another wholly Federal enterprise which has remained in the budget, the Tennessee Valley Authority. TVA's net outlays declined from $448 million in 1972 to $367 million in 1973 and are estimated at $458 million in 1975.

Since 1972, the Post Office (now the Postal Service) and the lending activities of the Rural Electrification Administration (now the Rural Telephone Bank and the rural electrification and telephone revolving fund) were removed from the budget. In fiscal 1973, the REA's net outlays were $528 million. By 1975—now outside of the budget—its net lending is estimated to reach $784 million; in addition, $19 million of administrative costs continue to appear in the budget.

Several new wholly Federal activities have been established since 1972, and their finances will be "off-budget"—the Environmental Financing Authority, the Federal Financing Bank, and the U.S. Railway Association. Except in the case of the Postal Service, the excluded outlays of the off-budget agencies are for loan programs. These programs are similar in all substantive effects to the direct loan programs which are in the budget.

Another characteristic of this new category of agencies is that it is more difficult to obtain detailed information about their current and prospective operations than is the case of agencies which continue to be included in the budget. Table 3 pulls together the data on off-budget agencies which currently are dispersed over a variety of special analyses which accompany the budget document. When the Railway Association gets under way, it is likely that its disbursements will push the total outlays of the off-budget agencies well beyond $3 billion a year.

TABLE 3.—*Estimated net outlays of off-budget Federal agencies (fiscal year 1975, in millions of dollars)*

Agency:	Amount
Export-Import Bank	$1, 250
Postal Service [1]	733
Rural Electrification Administration	463
Environmental Financing Authority	240
Rural Telephone Bank	135
U.S. Railway Association	(²)
Federal Financing Bank	(²)
Total	2, 821

[1] Net after receipt of subsidy of $1,533 million from budget funds.
² Being organized; estimates not yet available.

If any forecast on Federal finance can be made with some confidence, it is that the number of "off-budget agencies" and the size of their outlays will continue to grow rapidly in the future. Unless Congress sees the danger of this apparently painless way of government financing, the unified budget and the full employment budget both will become less complete measures of the total flow of revenues and expenditures between the Federal Government and the public.

CONCLUSION

Although in earlier periods the full employment budget concept was a useful supplementary measure of Federal finance, in its current form it probably does more harm than good.

Each of the three shortcomings examined in this paper result in a bias in the same direction—making it relatively easy to show a balance or a surplus in the full employment measure.

It would seem that its use as a tool of policy analysis should be deferred pending detailed study of these and other shortcomings and the incorporation of necessary improvements.

Changes in the concept undoubtedly will be controversial. Yet, one specific revision would seem to be clearly required: the inclusion of the federally owned and operated "off-budget" agencies.

An upward revision in the unemployment assumption is warranted although no specific figure has yet attained the general acceptance of the old "4 percent." Finally, some substantial adjustment for the effect of inflation is needed. That may be in terms of computing the full employment budget in "real" terms, or perhaps on the basis of some standard long-run average rate of inflation.

Until these changes are made, the existing unified budget, with all of its obvious limitations, may be a more appropriate guide to fiscal policy.

CURRENT PROBLEMS IN THE FULL EMPLOYMENT CONCEPT

By Nancy H. Teeters*

The full employment budget concept was developed in an attempt to eliminate the effects of economic fluctuation on the budget from the effects of the budget on the economy. Fundamental to the concept is the notion of potential gross national product. Potential gross national product is that amount of total output which would result in a standard utilization rate of both labor and capital, but it is usually discussed in terms of utilization of labor. Cyclical fluctuations in the level of economic activity in the post World War II world have resulted in considerable variation in the utilization of labor and capital. Thus, one of the uses of potential GNP is to provide a yardstick against which the actual performance of the economy can be measured. Comparison of actual to potential GNP yields estimates of the size and timing of the cyclical fluctuations.

The cyclical fluctuations also affect the Federal budget and counter-cyclical fiscal policies attempt to offset the variations in economic activity. Counter-cyclical fiscal policy is usually discussed as being composed of two aspects: the effects of discretionary actions vs. the effects of the automatic stabilizers. Discretionary actions refer to policies deliberately undertaken to stimulate or restrain the economy, such as decreases or increases in tax rates or changes in expenditures by the introduction of new programs or reduction of existing ones. The automatic stabilizers reflect the impact of the economy on the budget. Declining or low rates of growth in total output that occur during recessions depress incomes and Federal revenues below what they would have been if the recession had not occurred. Conversely, rapid increases in total output increase incomes and Federal revenues. The fluctuation in revenues that accompanies the business cycle provides one of the major sources of counter-cyclical fiscal policy. Reduced revenues associated with a recession increase the Government deficit or reduce any surplus, providing additional stimulus to the economy. Increased revenues associated with a recovery have the opposite effect and automatically provide restraint. On the expenditure side, there are programs that expand as unemployment rises and contract as it declines. Unemployment insurance is the most obvious example of this type of program, but there are others as well. The economic variations that affect the budget can be separated into two parts—those that arise from fluctuations in real output and those that arise from changes in the price level.

One way of showing the impact of the economy on the budget is to calculate Federal revenues on the basis of potential GNP and to adjust expenditures to reflect the same standard of utilization assumed

*Mrs. Teeters was Senior Specialist in Federal Budget, Congressional Research Service, Library of Congress when this paper was prepared.

in the potential GNP. At the time the concept was first quantified, the rate of inflation was not only moderate but also relatively stable. Consequently, the major adjustment made was to calculate the loss or gain in real output that occurred because the unemployment rate was above or below the standard selected. Ninety-six percent utilization of the labor force (i.e., 4 percent unemployed) has traditionally been used in calculating potential GNP.

In recent years, the rate of inflation has not been moderate nor has it been relatively stable. Variations in the rate of inflation do have automatic stabilization properties. During a period of increasing rates of inflation, the Federal budget will become more restrictive because inflation, in the short run, increases revenues more than it does expenditures. Inflation also increases expenditures, but usually only after a lag. Thus, there is a timing problem arising from the impact of inflation. In addition, as income rises, whether because of real growth or inflation, the proportion of personal income paid under the individual tax increases due to the progressive nature of the tax rate structure. This is partially offset by the flat rate tax on corporate income and payrolls. The responsiveness of the payroll tax to increases in money wages is also reduced by the ceiling on wages subject to tax.[1] But the impact of the progressive rate structure of the individual income tax is not fully offset and the elasticity of the total Federal tax system to changes in income is above 1.0—that is, a one percent increase in income leads to a more than 1 percent increase in revenues. If the increase in expenditures over time as a result of inflation is not as great as the increase in revenues, inflation will produce fiscal restraint.

The full employment calculation is being criticized on a number of grounds. However, it is useful to see what is to be gained if only the traditional concept is used. It provides a measure for changes in fiscal policy that abstracts from fluctuations in real output. An increase in the full employment deficit, or decrease in the surplus, indicates a move toward more expansive fiscal policy and not simply an increasing deficit because of declining economic activity. As long as the rate of inflation is relatively stable, this helps to delineate the effects of the automatic stabilizers from deliberate or discretionary fiscal policy changes. One of the major advantages of separating automatic from discretionary effects is to prevent policy actions that would make the cyclical fluctuations more severe. Attempts to reduce expenditures to match recession-depressed receipts would add to the contractionary forces already at work. Increasing expenditures to absorb receipts produced by a boom would add to expansionary pressures. Finally, economic growth does generate increasing revenues. The full employment calculation is helpful in planning future tax and expenditure policy changes, even though much more attention has to be given to the effect of inflation on the projections of increases in revenues and expenditures.

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[1] Payroll taxes would increase proportionally to increases in money wages below the ceiling. However, increases in wages above the ceiling would not be taxed. The inelasticity of the payroll taxes to increased wages used to be greater when the ceiling on wages was adjusted infrequently. However, recent legislation provides for automatic increases in the ceiling if an automatic increase in social security benefits occurs because of increases in the consumer price index.

The full employment budget concept is currently being criticized on four grounds:[2] (1) The 96 percent utilization target for the labor force is too high (i.e., 4 percent unemployed is too low); (2) with the rapid rates of inflation, the automatic stabilization effects have not been separated from the impact of discretionary policies, and in the short run the traditional method of calculation tends to overstate the surplus or understate the deficit; (3) the surpluses or deficits of State and local governments are being ignored in the evaluation of the impact of government on the economy; and (4) the activities of the off-budget Federal agencies tend to obscure the full financial effects of the Federal budget.

CHANGING THE UTILIZATION RATE

One of the arguments advanced for changing the policy target for the unemployment rate is that the composition of the labor force has shifted toward more young people and women, groups that tend to have higher rates of unemployment than prime age males. Because there are relatively more young people and women, there may be a tendency for labor markets to become tighter at higher rates of overall unemployment than they did in the mid-1950's.[3] The tighter labor markets lead to larger wage increases than would have been expected at given levels of over all unemployment in the earlier period. In essence, so the argument goes, inflationary pressures begin to build up before unemployment reaches 4 percent. Edward F. Denison has constructed indices for the various factors that influence labor inputs.[4] His index for the change in the age-sex composition of the labor force drops from 100.0 in 1958 to 96.6 in 1969.

Offsetting this argument is the impact of the increasing educational achievement of the labor force. Increased education has "upgraded the skills and versatility of labor and contributed to the rise in national income." [5] Denison's index for the influence of education rises from 100.0 in 1958 to 106.7 in 1959.

Recent work done at the Council of Economic Advisers also attempts to estimate the effect of the shift in the composition of the labor force.[6] The 1956 unemployment rates by age and sex cohort were applied to the same groups in the total labor force in subsequent years. According to these estimates, a 4.6 percent rate of unemployment in 1973 would be exerting approximately the same degree of pressure on the labor markets as the 4.1 percent rate of unemployment did in 1956. No adjustment for changing education achievement was attempted in this work.

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[2] There have also been discussions about the relative income shares used to calculate the revenues and the desirability of weighting the components of receipts and expenditures because of the differential economic impact. See:

Blinder, Alan S. and Robert M. Solow, "Analytical Foundations of Fiscal Policy", *Economics of Public Finance*, Brookings Institution, 1974, p. 23–27.

Gramlich, Edward M. "The Behavior and Adequacy of the United States Budget, 1952–1964" *Yale Economic Essays*, Vol. 6, 1966, p. 99–159.

Musgrave, Richard A. "On Measuring Fiscal Performance", *Review of Economics and Statistics*, Vol. 46, 1964, p. 213–20.

Okun, Arthur M. and Nancy H. Teeters, "The Full Employment Surplus Revisited". *Brookings Papers on Economic Activity*, Vol. 1, 1970, p. 82–88.

[3] Perry, George L., "Changing Labor Markets and Inflation," *Brookings Papers On Economic Activity*, Vol. 3, 1970, p. 411–448.

[4] Denison, Edward F., *Accounting for the United States Economic Growth, 1929–1969*, The Brookings Institution, 1974, p. 32.

[5] *Ibid.*, p. 43.

[6] von Furstenberg, George M., "New Potential Output Estimates for Economic Policy," Council of Economic Advisers, processed 1974.

What does a change in the utilization target do to the estimates of potential GNP and full employment revenues and expenditure calculations? Under one way of calculating real potential GNP, it would simply raise or lower the estimates of potential GNP for each period but would not affect the rate of growth. This assumes, of course, that the potential rates of growth in the labor force and/or productivity are unaffected by the utilization target chosen.

The official growth rate in potential GNP is estimated by the Council of Economic Advisers based on research developed by the Bureau of Labor Statistics. The 4 percent growth in potential GNP currently being used combines a projected increase in the labor force of 1.8 percent per annum and anticipated increase in productivity of 2.5 percent per annum with an annual allowance for reduction in the number of hours worked. If the rate of growth in potential GNP were not affected, a reduction in the unemployment target would lower potential GNP and full employment revenues and increase expenditures somewhat (primarily unemployment benefits), or vice versa if the target were raised. The result would be a change in the *level* of the estimated surplus or deficit for each time period. The estimated amount of automatic stabilization would be different. However, the change in the surplus from one period to the next would probably not be affected much. Abstracting from the problem of changes in price levels for the moment, the full employment calculation would still indicate the direction and relative size of changes in fiscal policy. It is the change in the full employment surplus that is the best indication of policy.

If one assumes that the growth of potential GNP *is* affected by the chosen policy target, then the alternate estimates of potential GNP would not be parallel lines but diverging ones. How much effect there would be would depend probably on how far from the traditional 96 percent utilization target one moves. If the chosen policy target were 6 percent or 2 percent unemployed and economic policies were undertaken to achieve that goal, the potential rate of growth probably would be affected mainly because labor force participation would respond to the more restrictive or expansionary policies. One estimate of the effect on potential growth of various policy targets is that, with a 3.5 percent unemployment target, the estimated growth rate for potential GNP would be 0.8 to 0.9 percent higher per annum, and with a 4.5 percent target, the potential growth rate would be a similar amount lower.[7] If these estimates are correct, changing the policy target would have an effect, especially after the passage of several years.

Another estimate of the effect of changing the target is the one referred to earlier, developed at the CEA by George M. von Furstenberg. In these estimates the unemployment rate defined as being "full employment" was estimated to take account of the changing composition of the labor force. The full employment labor force utilization rate in this calculation drops from 95.9 percent (4.1 percent unemployed) in 1955 to 95.4 percent (4.6 percent unemployed) in 1973. Between 1955 and 1965, the potential GNP estimated by the trend method and the one taking into account the changing composition of the labor force grew at approximately the same rate—3.6 percent per annum.

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[7] Denison, *op. cit.*, p. 91.

After 1965, the trend rate of growth was changed to 4 percent. The estimates developed by von Furstenberg average out to a 4 percent rate of growth per annum for the 1965 to 1974 period. However, these estimates indicate a somewhat slower growth in the earlier years of the period during the time of the Vietnam build-up and somewhat faster growth in the latter years, when demobilization was taking place. For 1973, the trend method and von Furstenberg method yield estimates of potential real GNP that are remarkably close together— $848.5 billion from the trend and $851.6 billion from the other. This is a rather curious result since the trend method is supposed to be compatible with an unemployment target of 4 percent and the von Furstenberg estimates with a 4.6 percent target.

This implies either that the . . . official series . . . is in fact, compatible with rising rather than constant unemployment rates or that the variable-unemployment rate estimate . . . is biased upwards to an increasing extent as time progresses.[8]

The author attempted to test which was the most likely reason for the similarity of the estimates and came to the conclusion that it might well be a bit of both. The potential estimated from a trend rate of growth may be compatible with some rise in the target unemployment rate, but the method for adjusting for the changes in the composition in the labor force may overstate the unemployment rate in 1973 compatible with the labor force tightness of the mid-1950's. In other words, the 4.6 percent may be too high.

What this implies is that changing the unemployment policy target may affect the rate of growth in potential GNP. It is not entirely clear by how much, since different investigators have developed somewhat different answers. In any one year, a change in the potential growth rate has relatively little impact on the estimates of real GNP. However, over time the differences accumulate. Table 1 shows estimates of potential real GNP at different growth rates, using 1969 as a common base. By 1974, the level of real potential GNP would have been 1.4 percent lower using a 3.7 percent rate of real growth or 1.4 percent higher using 4.3 percent (compared with the level obtained by using the 4 percent trend).

TABLE 1.—POTENTIAL REAL GNP AT DIFFERENT RATES OF REAL GROWTH

Year	Rate of growth				
	3.2	3.7	4.0	4.3	4.8
	Potential real GNP in billions of dollars				
1969	727.9	727.9	727.9	727.9	727.9
1970	751.2	754.8	757.0	759.2	762.8
1971	775.2	782.8	787.3	791.8	799.4
1972	800.0	811.7	818.8	825.9	837.8
1973	825.6	841.8	851.6	861.4	878.0
1974	852.0	872.9	885.7	898.4	920.1
Percent difference in 1974 from 4-percent rate of growth	−3.8	−1.4	0	1.4	3.9

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[8] von Furstenberg, op. cit.

IMPACT OF INFLATION

As mentioned earlier, variation in the rate of inflation complicates the full employment calculation in two ways. One is the timing problem and the other is whether inflation permanently affects receipts differently from expenditures. Critics of the full employment concept claim that during periods of accelerating inflation, the surplus is overstated or the deficit is understated because revenue collections reflect the impact of inflation immediately.

Inflation also increases expenditures. Federal civilian and military retirement are automatically adjusted for changes in the Consumer Price Index (CPI). Federal pay is adjusted annually to comparable private sector wages. Social security benefits in 1975 are to be adjusted annually for increases in the CPI, if Congress has not acted sooner to raise benefits. Food stamps are adjusted twice a year for changes in the cost of the economy food plan. In addition, the income test for eligibility for food stamps is automatically raised when the adjustment is made for food stamps. Price increases also feed back semiautomatically in programs providing medical service, mainly Medicare and Medicaid, since medical bills are reimbursed on an *ex post* basis. Interest costs, especially short-term interest rates, reflect the impact of inflationary forces on the money markets. These programs accounted for 57 percent of the $304.4 billion of outlays originally estimated for fiscal 1975. However, the effects of rapid inflation hit the expenditures side only after a lag which may be from 3 months to a year. In addition, there is the remaining 43 percent of outlays which are not adjusted for inflation automatically. In the short run, since revenues are affected immediately and some expenditures affected only after a lag, an increase in the rate of inflation makes fiscal policy automatically more restrictive than it would have been at a steady rate of inflation. Moreover, if the rate of inflation begins to decline, the reverse happens. The rate of growth in revenues begins to slow while there is still considerable upward pressure on expenditures as a result of the past inflation. In addition, legislated adjustments for inflation are frequently made *ex post*, either explicitly, such as increases in veterans' benefits, or implicitly as funding for programs is increased.

The full employment calculation is based on a current-dollar potential GNP that is derived by combining potential real GNP with the actual GNP deflator.[9] Thus, the actual rate of inflation gets built into the calculation and the automatic stabilization effects are not eliminated. The difficulties of correcting for varying rates of inflation arise because the bouts of inflation have had a ratchet effect on the price level, or at least they have had so far in most of the post-World War II period. With properly constructed estimates for potential GNP in real terms, output should fluctuate around the estimated potential, being above potential during booms and below it during recessions. However, after a period of inflation—

. . . although the rate of increase in prices may come back down to normal, the level of prices will not roll back just because excess demand is eliminated . . . it will stay above the old path . . . it would not be satisfactory to draw a "normal path" of prices and to stick to that path for calculating full employment revenues

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[9] Effective tax rates have to be calculated from actual revenues compared to actual incomes in order to capture the effect of the progressive rate structure of the individual income tax. To calculate full employment revenues, these tax rates are applied to the real potential GNP that has been converted to current dollars via the deflator.

regardless of what happens. . . . Unlike the path for potential output, the future normal path for prices is subject to major revision in light of past deviations from the path.[10]

This may not be completely true after the current inflation recedes because so much of it has occurred in commodity prices which in the past had much greater flexibility than consumer prices, but it is still unlikely that the price level will return to what it was in 1971. If current-dollar potential GNP is derived by combining estimates of real GNP assumed to grow at, say, 4 percent a year from 1969 to the present, with a deflator that grows at, say, 3 percent a year over the same period, the resulting estimate of current-dollar potential GNP is so far out of line with actual GNP by 1973 as to be irrelevant.[11] Full employment GNP in current dollars would have been estimated at $1,309 billion in 1974, nearly $90 billion below actual GNP, which reflected an unemployment rate between 5 and 6 percent. A second way to approach the problem would be to use the average increase in the deflator over the period to construct a hypothetical deflator. At least, the actual price index would fluctuate around the hypothetical one. However, there are a number of things wrong with this solution. The hypothetical index would have to be revised periodically to obtain a new average. The rate of growth in the constructed index would depend on the period chosen for the average. In periods of rapid increase in prices, even the average would be too high to be politically acceptable or economically desirable as a target. Table 2 shows the actual GNP deflator for calendar years 1969 to 1974. It also shows hypothetical deflators that assume a steady 3 percent rate of inflation, a steady 4.8 percent, which is the average annual rate from 1969 to 1973, and a 5.8 percent, which is the average annual rate for the 1969 to 1974 period. The percentage deviation of these hypothetical deflators from the actual is also shown.

TABLE 2.—ACTUAL AND HYPOTHETICAL GNP DEFLATORS

[1958=100]

Assumed growth rate		3 percent		4.8 percent		5.8 percent	
Year	Actual level	Level	Deviation from actual	Level	Deviation from actual	Level	Deviation from actual
1969	128.20	128.2	----------	128.20	----------	128.20	----------
1970	135.24	132.05	−2.36	134.35	−0.66	135.58	0.25
1971	141.35	136.01	−3.78	140.80	−.39	143.39	1.44
1972	146.12	140.09	−4.13	147.56	.99	151.65	3.78
1973	154.31	144.29	−6.49	154.64	.21	160.39	3.94
1974	170.18	148.62	−12.67	162.07	−4.77	169.63	−0.32

At times it would create the situation of the full employment revenues exceeding the actual revenues because the actual rate of inflation is too low. The strong dislike for inflation makes such a statement untenable. Moreover, it would be necessary to calculate expenditures at some standard rate of inflation, taking into account the various lags in its impact.

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[10] Okun, Teeters, *op. cit.*, p. 91.
[11] Another set of problems could arise with assumptions such as these. It would be easy to jump to the assumption that the appropriate rate of growth in current dollar GNP is 7 percent a year and that it really does not matter much whether it is achieved through price increases or increases in real output. That would be a step backward in economic analysis.

It should be possible to deflate or to calculate Federal expenditures adjusted to some standardized rate of inflation. It is easier to conceptualize such adjustment using the national income concept of Federal expenditures than by using the unified budget concept. Deflators already exist for Federal purchases of goods and services although these deflators have a peculiar bias. No allowance is made for productivity increases in government pay. Regardless of personal evaluation of the productivity of government, zero productivity is an extreme assumption. Estimates of government purchases in real terms thus tend to be lower than they would be otherwise.

Transfer payments and grants to State and local governments could be deflated by the index for personal consumption expenditures. Other grants could be adjusted by the deflator for State and local purchases. It too assumes zero productivity. A major problem is developing a way to deflate interest payments. It would require applying some "real" rate of interest or a "real" rate of interest plus a standardized inflation to the outstanding public debt. The problem of deflating interest exists in the unified concept of the budget also and is further compounded by the existence of loan extensions and repayments. Ideally, one would prefer to deflate loan disbursements by some current deflator and repayments by some past one.

A possible third way to adjust the revenues for varying rates of inflation is to accept last year's price level as given and project the price index forward at some standardized growth rate or even zero, starting over again for each subsequent period. What this does is to incorporate last year's inflation rate into this year's calculation of potential GNP and revenues as shown in Table 3.

TABLE 3.—ACTUAL AND HYPOTHETICAL DEFLATORS ACCEPTING LAST YEAR'S LEVEL AS GIVEN

[1958=100]

Year	Deflators					
	Actual level	Rate of growth	0 growth level	Rate of growth	4 percent growth level	Rate of growth
1969	128.20	4.82	122.30	....	127.19	....
1970	135.24	5.49	128.20	4.82	133.33	4.83
1971	141.35	4.52	135.24	5.49	140.65	5.49
1972	146.12	3.37	141.35	4.52	147.00	4.51
1973	154.31	5.60	146.12	3.37	151.96	3.37
1974	170.18	10.28	154.31	5.60	160.48	5.60

This method appears to be similar to the inflation adjustment suggested by Blinder and Solow.[12] They suggest that the correct adjustment for inflation is to reduce full employment revenues by an amount equal to the product of the marginal propensity to tax, the rate of inflation, and nominal GNP. The level of the price index is incorporated in the nominal GNP term. Either way, the adjusted full employment revenues would be lower. The automatic stabilization effects of variation in the rate of inflation arise because timing affects revenues and expenditures differently. This year's expenditures reflect decisions about last year's inflation. In some programs, as mentioned above, there are automatic adjustments for previous changes in the CPI. In others, legislative decisions have been made as to how much to adjust

[12] Blinder and Solow, op cit., p. 35.

outlays. Thus one would be comparing revenues and expenditures which have the same rate of inflation built into them. The major advantage of such an approach is that it avoids the sticky problems of deflating revenues and expenditures.

Using last year's rate of inflation in calculating revenues or something similar makes an adjustment for the timing problem that inflation creates in the full employment budget calculation. However there is still the question of whether in the long run, inflation does not add more to receipts than to expenditures because of the positive elasticity of the tax system (i.e., a 1 percent increase in incomes produces a more than 1 percent increase in receipts).[13] Leaving aside the timing problem, how responsive, *automatically*, are Federal expenditures to inflation? Many Federal expenditures programs are automatically adjusted for increases in the Consumer Price Index (CPI) as mentioned earlier. Federal civilian and military retirement programs are actually over-indexed. Retirees receive not only an adjustment for the CPI, but an additional 1 percent.[14] In the past, government wage increases have been greater than the increase in the CPI since they follow private wages which usually have an allowance for increasing productivity. The wage increase granted in October 1974 was considerably less than the increase in prices because it was based on a survey taken between January and May 1974, centered on March, and thus was taken before the end of wage controls. Assuming that wage-price relationships return to normal, government pay increases will add more to wage costs than the increase in the CPI. The provision of the Davis-Bacon Act that requires the payment of prevailing wages on Federal construction projects also probably increases Federal costs by more than the increase in the CPI. However, the increase in expenditures generated in these areas in excess of the CPI or other measures of overall inflation, while large, is not sufficient to offset the impact of inflation on the programs that are not automatically adjusted.

Without legislative action, total Federal expenditures would increase more slowly than the rate of increase in prices. Thus, some would say that the effect of the automatic stabilizers has not been removed from even the longer term calculation of the full employment budget. But this is an automatic stabilizer that works in only one direction, that of increasing restrictiveness. This increasing restrictiveness will occur whether the increase in incomes arises from increased real output or inflation. This aspect of the expenditure-revenue system does not fall neatly into the distinction between discretionary policies and automatic stabilization. It is a third aspect of fiscal policy and probably should be treated as such. It has been referred to either as the "fiscal drag" or "fiscal dividend." It is considered a fiscal drag if it is not used to increase expenditures or reduce taxes and, in fact, the budget does become more restrictive. It is considered a fiscal dividend if people are looking for resources to

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[13] The responsiveness of the revenue system to changes in income may be temporarily depressed as corporations shift their accounting methods for inventories from first-in-first-out to last-in-last-out in an effort to reduce inflation-generated profits. However, they cannot immediately switch back again if the former method becomes more favorable, so it should have a one-time effect.

[14] Federal civilian and military retirees receive an automatic increase in benefits when the CPI rises by 3 percent above the base period when the last increase occurred and stays 3 percent higher for three months. At that point an increase in benefits equal to the rise in the CPI (including any rise during the waiting period) is granted, plus 1 percent.

start new programs or reduce taxes. In reality, some of the dividend is used to maintain programs in real terms. Increased funding is requested and enacted for programs that are not automatically adjusted to increases in the price level. Defense, for example, asked for additional funding in a supplemental appropriation to cover the increased costs of the petroleum products it buys. How routinely such requests are enacted probably varies from program to program. The impact of inflation on government programs will undoubtedly receive more attention in the current situation than it has in the past. However it does require an overt decision to maintain programs constant in real terms, if automatic adjustments are not provided, so it would appear that such decisions fall under the purview of discretionary fiscal policy. But the fact that legislative action is taken to adjust many of the programs for inflation, thus increasing expenditures and reducing the fiscal drag or dividend, should not be overlooked in evaluating the impact of inflation on expenditures.

THE IMPACT OF THE TOTAL GOVERNMENT SECTOR

Fiscal policy has traditionally evaluated only the impact of the Federal budget on the economy. This has occurred for several reasons. Decisions concerning Federal outlays and revenues are more centralized and thus more amendable to discretionary changes for macroeconomic policy purposes. Moreover, only the Federal Government is in the position of running deficits for economic stabilization purposes. However in aggregate State and local governments contribute to the national fiscal position of restraint or stimulus. *The 1974 Annual Report of the Council of Economic Advisers* recognizes the importance of the State and local sector and combines it with the Federal sector to obtain a measure of overall fiscal stance. The national income concept for both sectors is used and each is calculated on a full employment basis.[15] To the extent that a Federal deficit is offset by State and local governments surpluses, the net expansionary impact is reduced. However as in evaluating the Federal fiscal position, it is the change in the combined surplus that is the better measure of the nature and change in fiscal policy. Using the estimates developed by the CEA, the $13.5 billion increase in fiscal restraint undertaken by the Federal Government in calendar 1973 was partly offset by a $4.3 billion reduction in the State and local full employment surplus.

THE IMPACT OF THE OFF-BUDGET AGENCIES

In recent years, an increasing number of Federal agencies have been given "off-budget" status. Their receipts and expenditures are excluded from the official budget. Some of them are privately owned (that is, they paid back any capital borrowed from the Treasury). Others can borrow from the Treasury. With one exception—the

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[15] *The 1974 Annual Report of the Council of Economic Advisers*, Washington, D.C., 1974, GPO, pp. 80, 81. The State and local sectors of the national income accounts include the receipts and expenditures of their pension funds. State and local governments do not usually consider these transactions as part of their current revenues and expenditures. However, from an economic point of view, the surpluses generated by these transactions reduce income and generate funds available for investment. They should be considered as part of the overall flow of receipts and expenditures.

Postal Service—the off-budget agencies are credit operations.[16] They raise money by selling securities in the market and use the proceeds to make loans to certain classes of borrowers. The agencies make loans to support housing, agriculture, higher education, exports, and railroad reconstruction, for example. They are a mechanism for allocating credit to special areas, usually ones that find it difficult to obtain credit or are crowded out of the market during periods of stringent monetary policy. Consequently, their net lending activity tends to increase when money is tight and to decline when conditions ease.

The existence of the off-budget agencies is criticized on several grounds. First, they interfere with the implementation of monetary policy because of the timing of their activities mentioned above. Second, when the Federal Reserve is limiting the volume of credit available, the securities issued by these agencies are said to "crowd out" private demand. Third, there are similar credit programs still included in the unified budget that are subject to the budget review process, which these agencies are not.

The presence and growing importance of the off-budget agencies raises anew the question of how the Federal budget should be defined and how Federal activity should be measured. Should loans that have a reasonable chance of repayment be included in the unified budget? The 1967 President's Commission on Budget Concepts recommended that Federal outlays should be divided into loans and expenditures, with the latter including those so-called loans that were really expenditure programs.[17] The Commission also recommended that several credit agencies be placed outside the budget. The loan-expenditure distinction was maintained in the presentation on the unified budget until 1972. Thereafter, the distinction was dropped, primarily because so little attention was paid to it.

The argument for separating loans from expenditures is that a loan sets up a requirement and schedule for repayment. Although the loan finances an increase in a certain activity in the short run, it reduces funds available in the future as the loan is repaid. The transactions are similar to obtaining a private loan, except that the federally sponsored programs tend to increase the availability of credit in specific areas, usually at interest costs below what would be charged in the private market. The Commission on Budget Concepts also recommended that the cost of the interest subsidy be calculated.

One of the questions that has to be asked about the Federal credit programs is whether they simply reallocate credit or increase total supply. The answer to this depends essentially on what monetary policies are being pursued. In a period of monetary ease, they may add to the total supply if the Federal Reserve permits an expansion of the total credit available. However in periods of monetary stringency, their major function is probably to reallocate the available credit. The question then is whether the specific activities which have access to

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[16] There is no official definition of what constitutes an off-budget agency. Consequently, the estimates of their activities tend to fluctuate widely. Some include only those agencies which have been created or put off-budget in recent years: Postal Service, Export-Import Bank, Rural Electrification and Telephone Fund, Federal Home Loan Mortgage Corporation, Student Loan Fund, Environment Finance Bank, United States Railroad Assoc. and the Federal Financing Bank. Others include those excluded earlier at the recommendation of the 1967 Commission on Budget Concepts as well: Federal National Mortgage Assoc. (FNMA), Bank for the Cooperatives, and the Federal Intermediate Credit Banks. The Federal Home Loan Banks are also sometimes included.

[17] *Report of the President's Commission on Budget Concepts*, Washington, D.C. 1967, GPO, pp. 47–55.

Federal credit should be given special treatment. In a way, a positive answer has already been given to this question or the various programs would not exist. But the programs should be subject to annual review. If overall credit availability is scarce, some determination would have to be made of the proportion that is to be channeled through Federal programs and of the allocation among the various programs.

Perhaps the way to handle the credit programs of the Federal Government is to resurrect the Commission's loan account concept but to carry it one step further. Put all the legitimate credit programs, whether currently in the unified budget or off-budget, into a credit budget. The programs would be subject to annual review and planning, taking into account their special relationship to monetary policy and debt management. Special attention should be given to types of programs best financed through credit programs rather than direct expenditures. If as much review were given to the credit programs as is given to regular budget expenditures, the temptation to create new ones to escape budget review would be reduced.

The review of such a credit budget by both the executive and legislative branches of government is vital for it to be properly included in economic policymaking. Since this would be an extension of monetary policy, Federal Reserve participation in the review and planning process would also be necessary. A perfunctory review of such a credit budget would probably perpetuate the rather haphazard creation of more off-budget agencies and further increase the difficulties of coordinating fiscal and monetary policy.

What should be included in such a credit budget? Most, if not all, of the activities now included as "annexed budgets" with the exception of the Federal Reserve.[18] All the programs listed in the *Budget Appendix* table "Loan Disbursements, Repayments and Net Outlays" should be reviewed to determine whether or not they are really credit operations. Those that are should be transferred to the credit budget. In addition to the disbursements, repayments, and net lending, the means of financing should be included, as well as the amount of outstanding debt. The discussion and review of such a credit budget should be in terms of its impact on monetary policy.

SUMMARY

Changing the definition of full employment from the current target of 4 percent to something higher would have some effect on the estimates of potential GNP. At a minimum, it would lower the level of the estimates and might affect the potential rate of growth. It would also make recessions look smaller and booms larger. Unless there is a substantial change in the rate of potential growth, however, the *change* in the full employment surplus should be relatively unaffected.

The technical argument for lowering the target utilization rate (raising the target unemployment rate)—the shift in the mix of the labor force—would appear to have been offset by the increasing educational achievement and the accompanying enhancement of labor

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[18] See footnote 16 for a list of the off-budget agencies and the allocation of credit.

skills. It could be argued that if the shift in the labor force had not occurred, it would be desirable to lower the target unemployment rate as increasing education reduces the number of unemployables.

It is true that major groups in the labor force have had lower rates of unemployment compared to 1956 with one exception. Teenage unemployment is high but has risen, compared to 1956, even during periods of relatively full employment. The increased number of young people as a result of the post-war baby boom will be a factor in the labor force for another five to six years until the decline in the birth rate that began in the early 1960's begins to affect labor force growth. This would seem to argue for better high school and manpower training programs, to prepare young people for jobs and to alleviate tightness in the labor market, rather than for a change in the target unemployment rate.

Although the problem that varying rates of inflation cause in the full employment calculation cannot be fully compensated, the recognition that it is, in part, a timing problem makes handling it more tractable. To the extent that the problem arises because inflation affects receipts immediately and expenditures only after a lag, an adjustment can be made to incorporate the same rate of inflation into both sides of the relationship. To the extent that expenditures are not automatically increased as prices and wages increase, inflation adds to the fiscal drag or dividend. The fiscal drag or dividend from real growth has long been recognized. The fiscal drag or dividend created by inflation must now also be recognized. However, the drag/dividend created by inflation is smaller than the one created by real growth because of the indexing of many Federal programs, which is more widespread than most people realize.

Closer attention must be given to the impact of State and local governments on overall fiscal policy. Because there are so many governmental units involved, it is difficult to use State and local governments as an instrument of fiscal policy, but Federal fiscal policy should include their position in the development of overall policy.

Finally, the development and review, by both the executive and the legislative branches of government, of a credit budget would make more explicit the allocation functions being performed by the Federal credit programs. Not only would it make Federal credit policies more explicit but it should enhance the coordination of fiscal and monetary policies.

The basic concept of the full employment budget calculation to develop a measure of fiscal policy that removes as much as possible of the impact of the business cycle on Federal receipts and expenditures is still valid. A better measure of discretionary fiscal policy can be obtained from the full employment calculation. The fact that modifications and adjustments are needed to improve the concept is part of the process of increasing our knowledge of the impact of fiscal policy.

COMMENTS ON TEETERS' "CURRENT PROBLEMS IN THE FULL EMPLOYMENT CONCEPT"

By MURRAY L. WEIDENBAUM

Nancy Teeters deals ably and constructively with the numerous criticisms that have been made of the full employment budget concept. Her inflation adjustment is imaginative and may well be a useful change. Yet several points need to be raised about the paper.

THE OFF-BUDGET AGENCIES

Mrs. Teeters may be correct in stating that there is no official definition of what constitutes an off-budget agency. Yet available budget materials do lend themselves to inferring the coverage of the concept. Several tables in the Federal Budget for fiscal 1975, the first time the term was introduced, limit their reporting of "off-budget" agencies to the following: the Postal Service, the Export-Import Bank, the Rural Electrification Fund, the Rural Telephone Bank, the Environmental Financing Agency, the U.S. Railway Association, and the Federal Financing Bank.

It turns out that these organizations, and no other, possess a unique set of characteristics: (1) They fully meet the coverage tests of the unified budget concept established by the President's Commission on Budget Concepts and (2) they have arbitrarily been moved out of the unified budget by specific congressional statute. The off-budget agencies have not been "privatized" as in the case of Fanny Mae, etc., but are truly wholly owned Federal agencies whose personnel are Federal employees and whose transactions really belong in the budget.

It is true that, with the exception of the Postal Service, these all are now credit agencies. Yet one of the major proposals for national health insurance—the Kennedy-Mills bill—would set up a massive new off-budget agency. The use of this subterfuge cannot be dismissed too lightly. The answer is not to move other items arbitrarily out of the budget, but to restore the comprehensive coverage of the unified budget.

We should recall that it was precisely budget gimmicks of this nature (e.g., moving the highway program out of the budget) that led to discrediting the old conventional budget and to its replacement by the unified budget. That still leaves the important question of the Federal credit agencies that are properly outside of the budget.

THE FEDERAL CREDIT AGENCIES

The extensive use of the Federal Government's credit power has resulted in the rise of a variety of federally related institutions and mechanisms which do not directly use the funds of the Federal Government. For the reasons given by Mrs. Teeters, it would be useful to

gather together data on their current and prospective operations. Yet, except for the modest activities authorized by the Federal Financing Bank Act, there is little discretionary power that the Executive Branch can exercise over the operations of these government-sponsored enterprises and the loan guarantee programs.

The suggested credit "budget" would help in focusing public attention on the use of the Government's credit power, but it should not be accompanied by any further exclusion of lending programs from the coverage of the budget. That would only further weaken the very limited controls that can now be exercised over Federal credit programs.

THE 4 PERCENT DEFINITION

The policy implications of changing the definition of "full employment" may be more important than noted in the paper. To the extent that decisionmakers use a balanced full employment policy as a guide for fiscal policy, raising the definition—say from 4 percent to 5 percent—means aiming at a greater degree of fiscal restraint. That would be the case because less Federal revenues and more expenditures would be anticipated at 95 percent utilization of the labor force than at 96 percent.

COMMENTS ON TEETERS' "CURRENT PROBLEMS IN THE FULL EMPLOYMENT CONCEPT"

By ROBERT M. SOLOW*

I have read Nancy Teeters' paper. It seems practical and sensible to me. It's a sober piece and ought to lead to some actual improvement.

THE FULL EMPLOYMENT CONCEPT

It would be a good idea to separate cleanly two possible meanings of "full employment." One is a target or "tolerable" degree of tight-ness in the economy, and the other is an estimate of that degree of tightness at which demand-pull inflation sets in too strongly. They may coincide, but they need not. Secondly, does anyone really believe that a half-point difference in the unemployment rate will change the potential growth rate by almost one point *permanently*? The diver-gences quoted presumably are short-run, and would last only long enough for the one-time adjustment in participation rates to be com-pleted. Obviously a really big change in the unemployment rate might affect population growth and the rate of technological progress; but the paper as it stands seems misleading to me.

THE IMPACT OF INFLATION

I think Nancy's point about the importance of timing is well-taken. The only expository point I would make is that she should recall that one of the points about full employment budgeting is to separate automatic and discretionary stabilization actions. That de-pends on your having a definition of what is automatic and what is discretionary. The indexing of some category of Federal expenditures is *prima facie* evidence that Congress intended to fix that category in real terms. My inclination unless there is some reason to think other-wise, would be always to assume that Congress intended to legislate real expenditures.

*Professor of economics, Massachusetts Institute of Technology.

THE RESPONSIVENESS OF STATE AND LOCAL RECEIPTS TO CHANGES IN ECONOMIC ACTIVITY: EXTENDING THE CONCEPT OF THE FULL EMPLOYMENT BUDGET

By Robert C. Vogel*

In the 1974 *Economic Report of the President* (pp. 80–81) the Council of Economic Advisers extended to state and local governments the concept of the full employment budget which had previously been applied only to the Federal Government, and this innovation was continued in the 1975 *Report* (pp. 64–66). Because of the increasing size of the state and local sector relative to the Federal sector, and especially the increasing reliance of state and local governments on Federal grants-in-aid, 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. Federal grants-in-aid to state and local governments reached $29.0 billion in 1971, the last year before revenue sharing, and $40.5 billion in 1973, more than double the amount in 1969. With the growing importance of these grants it is increasingly difficult to disentangle the Federal and the state and local sectors, so it seems particularly appropriate to analyze state and local receipts and expenditures in a way that can readily be aggregated with the Federal budget.

Although it is widely recognized that the full employment surplus has numerous shortcomings as a measure of Federal fiscal policy, it is clearly an improvement over the actual surplus and was officially adopted by the Nixon Administration as the principal indicator of Federal stabilization policy.[1] It thus seems reasonable to begin to analyze the fiscal stimulus or restraint provided by state and local receipts and expenditures, as the C.E.A. has done, by extending the concept of the full employment budget. However, the method used by the C.E.A. to estimate state and local full employment receipts needs to be examined more closely. As the 1974 *Report* (p. 81) states:

> There is also some evidence that tax rates tend to be raised when the gap between actual GNP and potential GNP widens. The average tax rates at full employment may therefore deviate systematically from the actual tax rates, contrary to the assumption made in estimating full employment receipts. Nevertheless the State and local budget calculated in this way does give a better estimate of the stance of overall fiscal policy than the actual budget.

    [1] See the *Economic Report of the President* (1971, pp. 70–74; 1972, pp. 64–65; 1973, pp. 40–41, 74–75). See Okun and Teeters, "The Full Employment Surplus Revisited," !*Brookings Papers on Economic Activity*, vol. 1, 1970, for a discussion of some of the problems associated with the full employment surplus.

Closer examination of this problem suggests that the importance of the behavior of tax rates has been underestimated and that the full employment receipts of state and local governments are in fact somewhat closer to actual receipts than to the estimates presented in the 1974 *Report* (p. 80). This examination of the behavior of tax rates also has important implications for the continuing controversy over cyclical perversity in the behavior of state and local budgets, a controversy in which the most recent major contributions suggest that this behavior is not perverse.[2]

The first section of this paper discusses the method used in the C.E.A.'s 1974 *Report* to calculate state and local full employment receipts—the same method which is used to calculate Federal full employment receipts. Next, the behavior of state and local tax rates used in this calculation is examined, and this behavior is compared with the behavior of Federal tax rates and with the tax rate assumption underlying the C.E.A.'s calculation of both Federal and state and local full employment receipts. In the third section an alternative method is developed which estimates state and local full employment receipts directly and thereby takes into account the response of state and local tax rates to changes in the gap between actual and potential GNP. This alternative method is then applied to the main components of state and local receipts and to the total receipts of each individual state to determine the extent to which the behavior of these components is consistent with the behavior of aggregate receipts. The concluding section not only examines the implications of changes in the state and local full employment surplus for the degree of fiscal stimulus or restraint provided by the total government sector, but also analyzes the implications of the behavior of state and local tax rates for the perversity hypothesis.

The analysis in this paper focuses on state and local receipts rather than expenditures, so that in calculating the state and local full employment surplus the paper follows the C.E.A. in assuming that state and local full employment expenditures are the same as actual expenditures. The principal justification for this assumption is that the adjustment to expenditures made in calculating the Federal full employment surplus is due primarily to differences in unemployment compensation at different levels of economic activity; and, as pointed out in the 1974 *Report* (p. 81), unemployment compensation is not a part of state and local expenditures. However, the 1975 *Report* (p. 65) suggests that state and local expenditures may not be independent of the budgetary position of state and local governments: [3]

Budgetary reserves are now so tight that the rise in state and local expenditures will have to slow considerably to adjust to the reduced growth of receipts, or taxes will have to be raised in a declining economy.

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[2] See for example: R. W. Rafuse, Jr., "Cyclical Behavior of State-Local Finances," in R. A. Musgrave, ed., *Essays in Fiscal Federalism* (Washington, D.C., 1965), pp. 62–121;
A. M. Sharp, "The Behavior of Selected State and Local Government Fiscal Variables During the Phases of the Cycles 1949–1961," *National Tax Association Proceedings*, 1965, pp. 599–163;
A. H. Hansen and H. S. Perloff, *State and Local Finance in the National Economy*, (New York, 1944). Hansen and Perloff provide the classic argument for State and local fiscal perversity.
The author of this paper would like to thank John Cornwall for calling these studies to his attention.
[3] On the other hand, the evidence on the behavior of state and local compensation of employees, presented below in footnote 6, suggests that state and local expenditures are not sensitive to the gap between actual and potential GNP.

Thus the behavior of state and local expenditures and the implications of this behavior for the calculation of the state and local full-employment surplus is clearly a topic for future research.

I. Applying the Federal Method

Federal full employment receipts are calculated separately for each of the main categories of Federal receipts. For each category the tax base at full employment is estimated and is then multiplied by the corresponding full employment tax rate. The same method has been applied by the C.E.A. to estimate the full employment receipts of state and local governments. In the national income accounts, state and local receipts are grouped into the same four categories as Federal receipts, but with an additional category for Federal grants-in-aid to state and local governments. Since Federal grants do not appear to vary significantly with the gap between actual and potential GNP, the level of grants at full employment has been assumed to be the same as the actual level of grants.[4]

For three of the other four categories of state and local receipts, the same full employment tax bases have been used as for Federal receipts. The full employment tax base for indirect business taxes is potential (full employment) GNP in nominal terms, that is, real potential GNP multiplied by the implicit price deflator for GNP. Although property tax receipts are much greater than sales tax receipts and account for almost 50 percent of state and local indirect business taxes, nominal potential GNP has been chosen as the best readily available approximation of the full employment tax base for both property and sales taxes. To calculate the full employment tax bases for corporate profit taxes and personal taxes, the shares of GNP at full employment must be estimated for corporate profits before taxes and for taxable personal income.[5] Corporate profits before taxes at full employment is clearly the appropriate full employment tax base for state and local corporate profit tax receipts; and taxable personal income at full employment has been chosen as the appropriate full employment tax base for state and local personal tax receipts, despite the fact that income taxes account for only 50 percent of these receipts.

For the last category of state and local receipts, a full employment tax base different from that used for the Federal Government has been chosen: contributions for social insurance to state and local governments are based on the wages and salaries paid to employees of state and local governments rather than on total wages and salaries for the economy. Since state and local wages and salaries do not vary significantly with the gap between actual and potential GNP, state and local full employment receipts from contributions for social insurance have been assumed to be the same as actual receipts.[6]

[4] Any variation in the level of Federal grants in response to the gap between actual and potential GNP might be expected to be in the opposite direction from tax receipts; that is, the farther the economy is below full employment, the higher the level of Federal aid to state and local governments would be (e.g. Federal grants for public sector jobs). A regression presented below in Table 4 suggests that such a relationship may exist, but the coefficient of the GNP gap is not highly significant and the regression shows highly significant serial correlation of residuals.

[5] Taxable personal income is defined as personal income, less transfers and other labor income, plus personal contributions for social insurance. Since the observed income shares exhibit substantial cyclical variations, full employment income shares have been estimated using regression equations which include such cyclical variables as the unemployment rate and the gap between actual and potential GNP.

[6] In a regression explaining the compensation of state and local employees (using quarterly observations for the period 1955 through 1971) with a time trend and the ratio of actual to potential GNP as independent variables, the t-value for the coefficient of the ratio of actual to potential GNP is less than 1.

In calculating Federal full employment receipts the full employment tax rate used for each category of Federal receipts is the observed tax rate, that is, the ratio of actual receipts to the tax base at the actual level of GNP. In calculating state and local full employment receipts the same assumption has been made, that observed tax rates adequately represent full employment tax rates. State and local full employment receipts are thus the sum of the full employment tax bases times the observed tax rates for three of the categories of receipts, plus the actual level of state and local contributions for social insurance and Federal grants to state and local governments.

Table 1 presents the following figures for state and local governments for the period 1955 through 1973: actual receipts, full employment receipts as estimated by the Federal method, and the ratio of actual receipts to full employment receipts. For comparison, figures are also given for the ratio of actual GNP to potential GNP and the ratio of actual Federal receipts to full employment receipts. (Table 1 also includes figures for state and local full employment receipts estimated by the alternative method presented in Section III; the present discussion refers only to state and local full employment receipts estimated by the Federal method.)

TABLE 1.—ACTUAL AND FULL EMPLOYMENT RECEIPTS OF STATE AND LOCAL GOVERNMENTS AND RATIOS OF ACTUAL TO POTENTIAL GNP AND ACTUAL TO FULL EMPLOYMENT RECEIPTS, 1955–73

| | | | Receipts of State and local governments | | | | |
| | | | | Estimated by Federal method | | Estimated by alternative method | |
	GNP actual ÷ potential	Federal receipts actual ÷ full employment	Actual (billions)	Full employment (billions)	Actual ÷ full employment	Full employment (billions)	Actual ÷ full employment
1955	.998	1.021	31.4	31.4	1.000	31.4	1.000
1956	.982	.999	34.7	35.1	.989	34.9	.994
1957	.963	.957	38.2	39.4	.970	38.7	.987
1958	.920	.881	41.6	44.7	.931	42.9	.970
1959	.945	.933	46.0	48.2	.954	47.0	.979
1960	.936	.909	49.9	52.8	.945	51.1	.977
1961	.922	.889	53.6	57.5	.932	55.2	.971
1962	.949	.925	58.6	61.3	.956	59.7	.982
1963	.952	.931	63.4	66.2	.958	64.6	.981
1964	.968	.956	69.5	71.5	.972	70.3	.989
1965	.992	.993	75.5	76.0	.993	75.7	.997
1966	1.017	1.016	85.2	84.2	1.012	84.7	1.006
1967	1.003	.984	93.6	93.7	.999	93.4	1.002
1968	1.010	.994	107.1	106.7	1.004	106.7	1.004
1969	.997	.994	119.7	119.9	.998	119.8	.999
1970	.954	.929	135.0	140.4	.962	137.4	.983
1971	.948	.917	152.2	159.3	.955	155.2	.981
1972	.968	.978	177.2	182.0	.974	179.3	.988
1973	.985	.972	193.5	196.0	.987	194.6	.994

The difference between full employment receipts and actual receipts increases with the size of the gap between actual and potential GNP for both the Federal and the state and local sectors. However, as Table 1 indicates, a change in the GNP gap has a more than proportionate effect on the difference between actual and full employment receipts for the Federal Government, but a less than proportionate effect for state and local governments. The relatively small response of state and local receipts has two main causes: (1) state and local receipts from Federal grants and from contributions for social insurance do not vary with the GNP gap; and (2) the share of corporate profits in GNP is highly responsive to changes in the GNP gap, and state and local governments obtain a much smaller share of their receipts from corporate profit taxes than does the Federal Government. Table 1

also reveals that both actual and full employment receipts of state and local governments have followed a relatively smooth path of growth over time; not only is the difference between actual and full employment receipts less for state and local governments than for the Federal Government, but the underlying trend in receipts is also much smoother.

II. The Behavior of State and Local Tax Rates

Before using the estimates in Table 1 based on the Federal method to evaluate the degree of fiscal stimulus or restraint provided by the full employment surplus of state and local governments, the appropriateness of using the Federal method to calculate these figures must be examined more closely. In particular, the assumption that observed tax rates adequately represent full employment tax rates must be examined more carefully. For a given set of tax laws, the ratio of receipts to the tax base at the actual level of GNP may differ from the ratio of receipts to the tax base at full employment if the response of receipts to changes in GNP is not unit elastic within the range between actual and potential GNP. Moreover, the assumption that legislated tax rates remain unchanged regardless of the gap between actual and potential GNP may not be valid.

Some evidence that observed state and local tax rates deviate systematically from full employment tax rates is provided by correlating changes in the observed tax rates with changes in the ratio of actual to potential GNP. Based on quarterly observations for the period 1955 through 1971, the correlation for indirect business tax rates (−.81) is clearly significant at the 1 percent level, and the correlation for corporate profit tax rates (−.26) is significant at the 5 percent level.[7] Although the correlation for personal tax rates (−.23) is significant only at the 10 percent level, it substantially exceeds the correlations for any of the observed Federal tax rates, which range from −.14 to .15. While the Federal correlations differ in sign, all the state and local correlations are negative, indicating that the observed state and local tax rates consistently increase as the gap between actual and potential GNP increases.

Because observed Federal tax rates do not vary significantly with the gap between actual and potential GNP, observed tax rates may appropriately be used as full employment tax rates in calculating Federal full employment receipts. However, such an assumption is clearly incorrect for state and local tax rates. When actual GNP falls short of potential, full employment receipts will be overestimated because the observed state and local tax rates are systematically higher than the full employment tax rates.

One possible cause of this behavior of observed tax rates is that state and local governments legislate higher tax rates in an attempt to overcome shortfalls in receipts resulting from the failure of actual GNP to reach potential. Alternatively, it may be that receipts from the various categories of state and local taxes do not increase proportionately with increases in the tax bases or that the tax bases do not increase proportionately with increases in GNP. However, this alternative explanation almost certainly does not account for the

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[7] Unless otherwise indicated, all regressions in the present paper are based on quarterly observations for the period 1955 through 1971; 1955 has been chosen as the starting point because mid-1955 is the benchmark for the potential GNP series, and 1971 is used as the end point to avoid any anomalies from the beginning of revenue sharing.

behavior of observed state and local corporate profits tax rates, because corporate profits before taxes are elastic with respect to the gap between actual and potential GNP, and corporate profit tax receipts are surely not inelastic with respect to corporate profits before taxes.

Numerous estimates have been made for the elasticities of state and local taxes, especially income and sales taxes, and although these estimates vary widely (in large part because of the difficulties involved in making such estimates) it cannot be concluded that these taxes are in general significantly inelastic.[8] But, as indicated above, income taxes and sales taxes respectively comprise less than half of personal tax receipts and indirect business tax receipts, and taxable personal income and nominal GNP may not be representative tax bases for the other receipts in these two categories. For the remaining components of personal tax receipts and indirect business tax receipts, particularly for property taxes, the true tax bases may not decline proportionately, if at all, when actual GNP falls short of potential. However, given the behavior of state and local corporate profit taxes, it seems likely that the behavior of observed tax rates for personal taxes and indirect business taxes is also due at least in part to increases in statutory tax rates in response to the gap between actual and potential GNP, and this would be consistent with the fears expressed by the perversity hypothesis, that state and local governments behave in a procyclical manner.

To investigate whether observed tax rates can be adjusted for the impact of the GNP gap, so that a modified Federal method might be used to estimate state and local full employment receipts, regressions have been run to explain the level of observed tax rates for three categories of state and local receipts. The results of these regressions with the ratio of actual to potential GNP and a time trend as the independent variables are presented in Table 2. For each of these categories of state and local receipts, the coefficient of the GNP gap is negative and significant at the 1 percent level, again indicating that a reduction in the ratio of actual to potential GNP causes observed state and local tax rates to increase.

TABLE 2.—REGRESSIONS EXPLAINING OBSERVED STATE AND LOCAL TAX RATES, QUARTERLY, 1955–71

Tax rates	Intercept	Time	GNP gap	$\bar{R}^2$	$\bar{S}_e$	Durbin-Watson statistic
Personal taxes	[1] 1.42	[1] 0.033	[1] −1.34	0.97	0.12	0.12
t-value	3.2	44.4	2.9			
Corporate profits taxes	[1] 6.78	[1] .041	[1] −6.78	.80	.40	.23
t-value	4.5	16.3	4.3			
Indirect business taxes	[1] 9.13	[1] .033	[1] −4.95	.99	.07	.25
t-value	34.6	75.0	17.8			

[1] Significant at the 1-percent level.

Note: Tax rates are in percentage terms; time is 1 in the 1st quarter of 1955, 2 in the 2d quarter, and so on; GNP gap is the ratio of actual to potential GNP. $\bar{R}^2$ and $\bar{S}_e$ are respectively the multiple correlation coefficient and the standard error of estimate, both adjusted for degrees of freedom.

[8] See Legler and Shapiro, "The Responsiveness of State Tax Revenue to Economic Growth," *National Tax Journal*, March 1968, pp. 46–56;
Friedlaender, Swanson, and Due, "Estimating Sales Tax Revenue Changes in Response to Changes in Personal Income and Sales Tax Rates," *National Tax Journal*, March 1973, pp. 103–110;
Williams, Anderson, Froehle, and Lamb, "The Stability, Growth and Stabilizing Influence of State Taxes," *National Tax Journal*, June 1973, pp. 267–724;
N. M. Singer, "The Use of Dummy Variables in Estimating the Income-Elasticity of State Income Tax Revenues," *National Tax Journal*, June 1968, pp. 200–204; and
N. M. Singer, "Estimating State Income Tax Revenues: A New Approach," *Review of Economics and Statistics*, November 1970, pp. 427–433.

These GNP gap coefficients might be used to adjust observed tax rates to yield more accurate estimates of state and local full employment tax rates. However, neither the regressions in Table 2, nor alternative regressions which have been run, are satisfactory for this purpose. Although the $\bar{R}^2$'s are high and the coefficients significant, the Durbin-Watson statistics are extremely low and indicate an unacceptable degree of serial correlation. Moreover, considering the inadequacy of the tax bases for some categories of state and local receipts, it seems more promising to estimate state and local full employment receipts in a more direct way.

III. AN ALTERNATIVE METHOD

In this section state and local full employment receipts are derived by estimating directly the impact of the gap between actual and potential GNP on actual receipts. First, the hypothesis is tested that actual receipts are determined by potential GNP rather than by actual GNP, in which case the gap between actual and potential GNP will have no appreciable impact on actual receipts, and actual receipts will be a good approximation of full employment receipts. When total state and local receipts are regressed on actual GNP and potential GNP, both in nominal terms, the coefficient of potential GNP (.151) is not only much larger than the coefficient of actual GNP (.022), but is also much more significant (the t-values are respectively 14.4 and 2.1).[9] In contrast, an analogous regression for Federal receipts reveals that actual GNP has the greater effect and that the coefficient of potential GNP is in fact negative.

These regressions confirm what was suggested in the preceding section: that state and local receipts are not primarily determined by actual GNP. State and local receipts are maintained, even when actual GNP falls short of potential, because observed tax rates rise. However, actual GNP does have some impact on state and local receipts, so it cannot be concluded that actual receipts are an adequate approximation of full employment receipts, and the gap between actual and potential GNP must be introduced as an explanatory variable. Moreover, although these regressions have very high $\bar{R}^2$'s, the Durbin-Watson statistics are even lower than those in Table 2.

In an attempt to develop more satisfactory regressions for estimating state and local full employment receipts, the gap between actual and potential GNP (expressed as a ratio of actual to potential GNP as in Tables 1 and 2) has been entered directly as an explanatory variable, and potential GNP in nominal terms has been replaced by a time trend and the implicit price deflator for GNP. All variables are expressed as logarithms so that the time trend is a constant growth rate which, better than potential GNP, represents the constant growth in state and local receipts due to the growth in tax bases and tax rates over time.[10] The GNP deflator indicates the influence of the

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[9] When state and local receipts net of grants and contributions for social insurance are used as the dependent variable, rather than total receipts, the coefficient of potential GNP is .100 and the coefficient of actual GNP is .025; the t-values are respectively 15.1 and 3.8.

[10] Potential GNP is itself a series of time trends with different growth rates over different periods due to estimated changes in the growth of manhours and productivity. The regressions, however, suggest that these slight changes in the growth rate of potential GNP do not affect the growth of state and local receipts, since a constant growth rate performs better than the C.E.A.'s estimate of potential GNP.

price level on state and local receipts and may be thought of as converting this constant growth rate to nominal terms.

These regressions for state and local receipts presented in Table 3 have very high $\bar{R}^2$'s; and although the GNP gap has a lower t-value than the other explanatory variables, even its coefficients are highly significant. The positive coefficient for the GNP gap indicates that state and local receipts increase as the ratio of actual to potential GNP increases, but the magnitude of the coefficient shows that the influence of the GNP gap on receipts is significantly less than proportionate. In contrast, the analogous regression for Federal receipts reveals that the coefficient for the GNP gap has a higher t-value than the other explanatory variables and that Federal receipts increase significantly more than proportionately with increases in the ratio of actual to potential GNP. These coefficients show again that the failure of actual GNP to reach potential has a much smaller effect on state and local receipts than on Federal receipts.

TABLE 3.—REGRESSIONS EXPLAINING STATE AND LOCAL RECEIPTS AND FEDERAL RECEIPTS, QUARTERLY, 1955–71

Receipts	Intercept	Time	GNP deflator	GNP gap	$\bar{R}^2$	$\bar{S}_e$	Durbin-Watson statistic	Autocorrelation adjustment coefficient
State and local total	1 3.04	1 0.015	1 1.39	1 0.377	0.999	0.0080	1.27	....
t-value	220.3	61.2	34.7	10.4				
Adjusted for autocorrelation	1 3.04	1 .016	1 1.39	1 .356	.999	.0074	1.96	0.376
t-value	130.9	37.1	20.8	6.2				3.2
State and local net of grants and contributions for social insurance	1 2.91	1 .014	1 1.33	1 .471	.999	.0113	.32	....
t-value	148.7	39.3	23.4	9.2				
Adjusted for autocorrelation	1 2.88	1 .015	1 1.25	1 .410	.999	.0062	1.71	.849
t-value	51.8	14.7	8.7	5.0				12.2
Federal total	1 4.18	1 .007	1 1.49	1 1.494	.989	.0350	.25	....
t-value	68.1	6.5	8.4	9.4				
Adjusted for autocorrelation	1 4.34	.005	1 1.71	1 1.840	.998	.0167	1.61	.901
t-value	21.5	1.4	3.7	8.3				14.9

1 Significant at the 1-percent level.

Note: Receipts are in current dollars, seasonally adjusted at annual rates; time is 1 in the 1st quarter of 1955, 2 in the 2d, and so on; GNP deflator is the implicit price deflator for GNP; GNP gap is the ratio of actual to potential GNP. All variables are expressed as logarithms. $\bar{R}^2$ and $\bar{S}_e$ are respectively the multiple correlation coefficient and the standard error of estimate, both adjusted for degrees of freedom.

Although the Durbin-Watson statistics for state and local receipts are much higher than in the preceding regressions, significant serial correlation of residuals persists, especially for receipts net of grants and contributions for social insurance.[11] Because of this problem, the regressions have also been run using the Cochrane-Orcutt[12] adjustment for autocorrelation, and the results of these regressions are also presented in Table 3. Except for raising the Durbin-Watson statistics substantially, adjusting for autocorrelation has very little effect on the regressions for state and local receipts, although the coefficients of the GNP gap are somewhat reduced. In contrast, adjusting for autocorrelation has a definite impact on the regressions for

[11] This suggests that analyzing receipts net of grants and contributions for social insurance is inadequate as it neglects the fact that all the categories of receipts are simultaneously determined. This will be explored further in the next section when the components of state and local receipts are examined.

[12] D. Cochrane and G. H. Orcutt, "Application of Least Squares Regression to Relationships Containing Auto-Correlated Error Terms," *Journal of the American Statistical Association*, March 1949, pp. 32–61.

Federal receipts and, in particular, the coefficient of the GNP gap is appreciably increased. The principal result of this adjustment is thus to magnify the different responses of state and local receipts and Federal receipts to deviations of actual GNP from potential.

Removing the cause of serial correlation by improving the specification of the model would clearly be better than simply adjusting for autocorrelation. Serial correlation is often caused by lags in adjustment, and it is implausible to expect that state and local governments will raise their tax rates immediately (that is, within one quarter) to offset shortfalls in receipts when actual GNP fails to reach potential. Because the techniques for estimating lagged relationships in the presence of serial correlation all have limitations, various approaches have been used in the present study, including the Almon lag technique, the estimation of distributed lags by ordinary least squares, and adding lagged independent variables.[13] All these approaches suggest a lag in adjustment of only one quarter; the total impact of the GNP gap on state and local receipts is simply spread over two quarters as the sums of the GNP gap coefficients for the current and preceding quarters are approximately equal to the GNP gap coefficients in Table 3.

The regressions in Table 3 have also been run using annual observations, and the results of the regression explaining total state and local receipts are given below:

	Intercept	Time	GNP defiator	GNP gap	$\overline{R}^2$	$\overline{S}_e$	Durbin-Watson statistic
	¹3.04	¹.015	¹1.39	¹.370	0.999	0.0058	2.32
t-value	145.7	40.5	22.9	6.7			

¹ Significant at the 1 percent level.

Annual observations not only eliminate significant serial correlation but also leave the coefficients of the explanatory variables virtually unchanged. Since the particular time profile of the impact of the GNP gap on state and local receipts is not a primary issue in calculating state and local full employment receipts, this regression strongly reinforces the principal conclusion that the coefficients in Table 3 accurately indicate the effect of the GNP gap on state and local receipts. Although the short lags in adjustment may still seem implausible, it should be recalled that the coefficients for time in the regressions in Table 2 indicate that state and local governments are continually raising their tax rates. Thus, it is the magnitude of tax increases that would occur in any event which is being influenced by the gap between actual and potential GNP.[14]
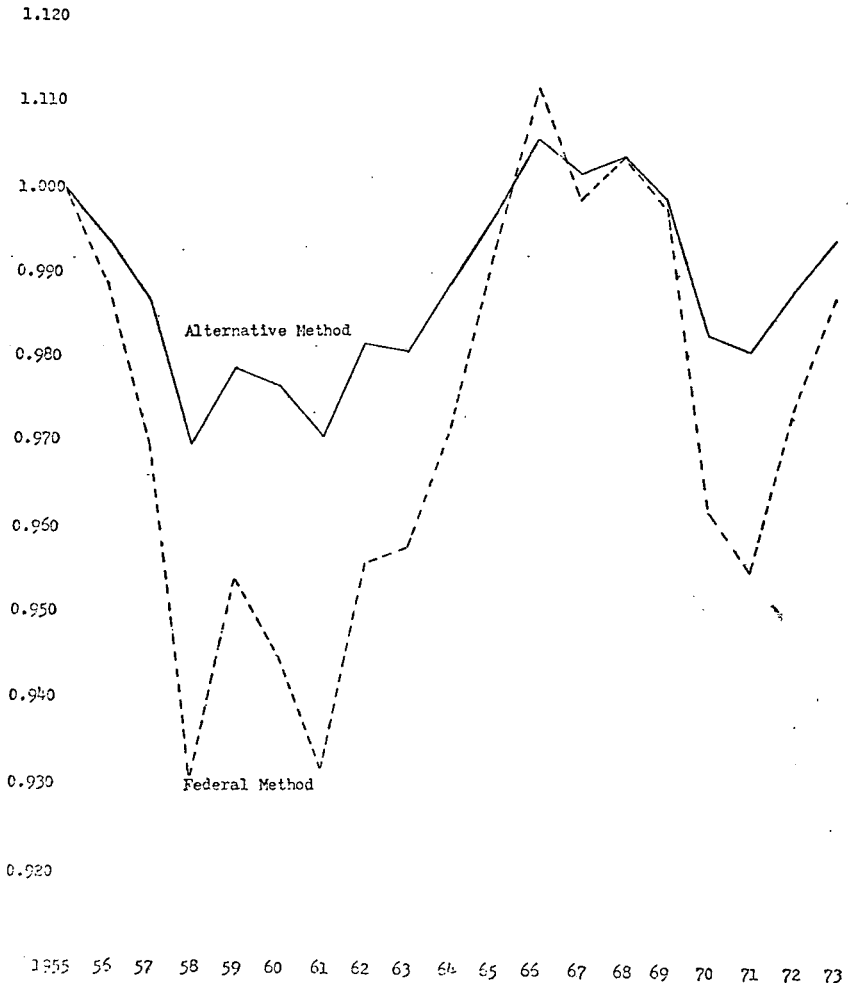
To derive estimates of state and local full employment receipts, actual receipts have been adjusted according to the coefficients for the GNP gap in Table 3, and these estimates are presented in Table 1 as the alternative method. Since the regressions for total state and local receipts are superior to those for receipts net of grants and contributions for social insurance, the adjustment has been carried out for total receipts. The GNP gap coefficient used to adjust total

[13] See: Z. Grilliches, "Distributed Lags: A Survey," *Econometrica*, January 1967, pp. 16–49; P. Schmidt and R. N. Waud, "The Almon Lag Technique and the Monetary Versus Fiscal Policy Debate," *Journal of the American Statistical Association*, March 1973, pp. 11–19.

[14] As indicated above, short lags in adjustment may result in part from the inelasticity of state and local receipts with respect to the gap between actual and potential GNP.

receipts is .37, a rounded average of .377 and .356 from Table 3, which is also the same as the GNP gap coefficient estimated with annual observations. As shown in Table 1 and Figure 1, state and local full employment receipts estimated by the alternative method are almost always closer to actual receipts than to full employment receipts estimated by the Federal method, again reflecting the rise in observed state and local tax rates when actual GNP falls short of potential.

FIGURE 1.—*Ratio of actual to full employment receipts of state and local governments.*

IV. THE COMPONENTS OF STATE AND LOCAL RECEIPTS

Before discussing further these estimates of state and local full employment receipts and the behavior of observed tax rates, the main components of state and local receipts should be examined. Table 4 presents the results of estimating the equation used in Table 3 for

the five major categories of state and local receipts. These regressions all have the same high $\bar{R}^2$'s and generally low Durbin-Watson statistics as the aggregate regressions. Most important for the present study are the estimated coefficients for the GNP gap, and these show the expected patterns for the various categories. Receipts from corporate profits taxes are highly elastic with respect to the GNP gap because of the sensitivity of the corporate profit share to fluctuations in economic activity. Although receipts from personal taxes vary less than proportionately with the GNP gap, they are much more sensitive to the GNP gap than are total state and local receipts. Thus for these two categories of state and local receipts the tax rates do not rise sufficiently to offset the effects on the tax bases of the failure of actual GNP to reach potential.[15]

TABLE 4.—REGRESSIONS EXPLAINING THE COMPONENTS OF STATE AND LOCAL RECEIPTS, QUARTERLY, 1955–71

Receipts	Intercept	Time	GNP deflator	GNP gap	$\bar{R}^2$	$\bar{S}_u$	Durbin-Watson statistic
Personal taxes	¹0.953	¹0.018	¹1.83	¹0.712	0.999	0.0199	0.75
t-values	27.3	28.5	18.0	7.9			
Corporate profits taxes	−.033	¹.007	¹2.71	¹2.636	.980	.0679	.85
t-values	.3	3.0	7.8	8.6			
Contributions for social insurance	¹.206	¹.015	¹1.52	².143	.999	.0136	1.12
t-values	8.6	35.2	21.9	2.3			
Indirect business taxes	¹2.681	¹.014	¹1.05	¹.273	.999	.0101	.30
t-values	150.7	42.9	20.4	5.9			
Federal grants	².279	¹.028	².89	²−.641	.987	.0754	.63
t-values	2.1	11.6	2.3	1.9			

¹ Significant at the 1-percent level.
² Significant at the 5-percent level.

Note: Receipts are in current dollars, seasonally adjusted at annual rates; time is 1 in the 1st quarter of 1955, 2 in the 2nd, and so on; GNP deflator is the implicit price deflator for GNP; GNP gap is the ratio of actual to potential GNP. All variables are expressed as logarithms. $\bar{R}^2$ and $\bar{S}_u$ are respectively the multiple correlation coefficient and the standard error of estimate, both adjusted for degrees of freedom.

On the other hand, the GNP gap has little influence on receipts from either Federal grants or contributions for social insurance; the GNP gap coefficients are significant only at the 5 percent level, and both these regressions (like the others) show highly significant serial correlation of residuals. The assumption in the Federal method for calculating state and local full employment receipts that the full employment level of receipts for these two categories is the same as the actual level, thus seems appropriate. However, the regressions in Table 3 reveal that separating out these two categories from total receipts (as is done in the Federal method) yields significantly worse results in terms of the highly significant serial correlation of residuals indicated by the extremely low Durbin-Watson statistic.

Examining the components of state and local receipts is useful because shifts in the relative importance of these components could affect the behavior of total receipts and hence the estimates of full employment receipts. Equally important, however, is whether analyzing the components, rather than using an aggregate regression, yields more precise estimates of the factors affecting total receipts. As Grunfeld and Griliches[16] point out, simply comparing $\bar{R}^2$'s is not

[15] As previously suggested, the greater sensitivity of Federal receipts to the GNP gap is due to the fact that these two categories make up a higher percentage of Federal receipts as well as to the fact that Federal tax rates do not vary with the GNP gap.
[16] Y. Grunfeld and Z. Griliches, "Is Aggregation Necessarily Bad?" *Review of Economics and Statistics,* February 1960, pp. 1–13.

an appropriate test. Rather their analysis suggests comparing estimates of total receipts from the aggregate regression with estimates of total receipts based on summing the estimates for the components. The variance of the residuals for total receipts based on the component regressions (.0062) is much greater than the variance of the residuals based on the aggregate regression (.0001), so that the aggregate regression better explains the behavior of total state and local receipts.

Following the analysis of Grunfeld and Griliches, the reason must be that the loss from aggregation is exceeded by the gain from improved specification. In particular, each component regression omits a significant aggregate variable: the receipts from all other taxes. When there is a shortfall in the receipts from any particular tax because actual GNP fails to reach potential, state and local governments do not attempt to maintain receipts from that tax alone but rather raise various tax rates to maintain total receipts. This explains the inferior performance of both the component regressions and the regression for total receipts net of grants and contributions for social insurance. It also implies that state and local governments do indeed legislate higher tax rates in response to shortfalls in receipts and that the behavior of observed tax rates is not simply due to the inelasticity of receipts with respect to the gap between actual and potential GNP.

The regression in Table 4 for indirect business taxes reveals that this category of receipts is highly inelastic with respect to the GNP gap. Because indirect business taxes are so heterogeneous and are by far the largest category of state and local receipts, these taxes have been broken down into their three main components. Since quarterly data are not available, the regressions explaining these components are based on annual data. The results are presented in Table 5 along with a regression for total indirect business taxes based on annual observations, which is consistent with the regression in Table 4 based on quarterly observations.[17]

TABLE 5.—REGRESSIONS EXPLAINING THE COMPONENTS OF STATE AND LOCAL INDIRECT BUSINESS TAX RECEIPTS, ANNUAL, 1955–71

Receipts	Intercept	Time	GNP deflator	GNP gap	$\bar{R}^2$	$\bar{S}_e$	Durbin–Watson statistic
Sales taxes	[1] 1.76	[1] 0.043	[1] 1.94	[1] 0.932	0.999	0.0168	1.66
t-values	30.7	10.6	12.6	5.9			
Property taxes	[1] 1.73	[1] .072	[1] .37	[1] −.420	.999	.0086	1.27
t-values	58.8	34.8	4.7	5.2			
Other taxes	[1] 1.09	[1] .039	[1] .92	[1] .936	.997	.0184	2.45
t-values	17.3	8.9	5.5	5.4			
Total indirect business taxes	[1] 2.66	[1] .056	[1] 1.05	[1] .278	.999	.0096	1.26
t-values	81.1	24.1	12.0	3.1			

[1] Significant at the 1 percent level.

Note: Receipts are in current dollars; time is 1 in 1955, 2 in 1956 and so on; GNP deflator is the implicit price deflator for GNP; GNP gap is the ratio of actual to potential GNP. All variables are expressed as logarithms. $\bar{R}^2$ and $\bar{S}_e$ are respectively the multiple correlation coefficient and the standard error of estimate, both adjusted for degrees of freedom.

All the regressions in Table 5 have high $\bar{R}^2$'s and all the explanatory variables are highly significant; in addition, the Durbin-Watson statistics indicate that serial correlation is much less serious than for the

[17] The coefficients of the explanatory variables are almost identical in the two regressions (except for the coefficient of time which must be adjusted by a factor of four); and the Durbin-Watson statistic is greatly increased, which is to be expected given the difference between the quarterly and annual regressions for total receipts.

regressions with quarterly observations. The GNP gap coefficients show that receipts from both sales taxes and other taxes decrease almost proportionately with increases in the gap between actual and potential GNP. Receipts from property taxes, however, increase significantly as the gap between actual and potential GNP increases, so that state and local governments must raise property tax rates to offset shortfalls in receipts from other taxes. This result again implies that the receipts from various taxes are simultaneously determined, and that the behavior of observed tax rates cannot be due entirely to the inelasticity of receipts with respect to the gap between actual and potential GNP.

Despite the superiority of the regressions for total state and local receipts over the regressions for the components, it is worthwhile to compare the estimates of state and local full employment receipts based on the components with the figures presented in Table 1. The GNP gap coefficients in Table 4 have been used to adjust the actual receipts for each component in order to derive these estimates of state and local full employment receipts. Estimates of state and local full employment receipts based on the components differ by at most $.2 billion from the estimates based on total receipts presented in Table 1 (alternative method) and are therefore not reported.

The components of state and local receipts can also be studied by examining the behavior of individual decisionmaking units, that is, individual state and local governments. Since it is not feasible to subdivide receipts simultaneously by type of tax and by individual governmental unit or to analyze separately the thousands of local governments, the total receipts of individual states have been examined. The equation used in Tables 3, 4, and 5 has been estimated for each of 48 states, using annual data for the period 1957–58 through 1970–71.[18] A regression has also been estimated for these 48 states combined, and the results are given below:

	Intercept	Time	GNP deflator	GNP gap	$\overline{R^2}$	$\overline{S_e}$	Durbin-Watson statistic
	16. 33	¹0. 060	¹1. 56	¹0. 581	0. 99	.017	2. 4
t-value:	292. 0	14. 5	9. 3	3. 8			

¹Significant at the 1 percent level.

Total state receipts behave very much like total state and local receipts, but are somewhat more sensitive to the GNP gap. The regressions for the individual states, which can only be summarized here, show some variability, but are generally quite similar to the results given above. All the regressions for individual states have R^2's greater than .95; most of the Durbin-Watson statistics suggest no serial correlation; and the coefficients for time and the GNP deflator are generally significant at the 1 or 5 percent level. However, only 18 of the 48 coefficients for the GNP gap are significantly different

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[18] Alaska and Hawaii are omitted because their recent statehood and noncontiguous locations might cause them to behave atypically. *State Government Finances* (1958–1971) is the source of the data which are given on a fiscal year basis; 45 of the 48 states have fiscal years which end on June 30. Total receipts do not include unemployment compensation funds because these are managed by the Federal Government and are included in the figures for the Federal sector.

from zero at the 5 percent level; of these 18 coefficients, 13 lie between 0.5 and 1.0, and 5 lie between 1.0 and 1.5.[19] This indicates the limited influence of the GNP gap on the total receipts of individual states and suggests that states raise their tax rates to maintain receipts when actual GNP fails to reach potential.

V. CONCLUSION

The foregoing analysis indicates that the method used in the 1974 and 1975 *Economic Reports of the President* to estimate state and local full employment receipts is based on an inappropriate assumption about the behavior of state and local tax rates. The alternative estimates of state and local full employment receipts developed in this paper (see Table 1), are presented in Table 6 along with the estimates of the Federal full employment budget given in the 1975 *Report* (p. 64) in order to examine the degree of fiscal stimulus or restraint provided by the total government sector.[20]

TABLE 6.—ESTIMATES OF THE FULL EMPLOYMENT SURPLUS—FEDERAL GOVERNMENT, STATE AND LOCAL GOVERNMENTS, AND TOTAL GOVERNMENT SECTOR, 1955–73

	Federal			State and local			Total		
	Receipts	Expendi-tures	Surplus	Receipts	Expendi-tures	Surplus	Receipts	Expendi-tures	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 receipts are taken from table 1, estimated by the alternative method. State and local full employment expenditures equal actual expenditures.

Until 1970 the state and local full employment surplus moved within a relatively narrow range so that changes in the Federal full employment surplus dominated the macroeconomic impact of the total government sector. However beginning in 1970 and continuing through 1972, state and local governments had increasingly large

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[19] Because all States do not simultaneously experience the same fluctuations in economic activity (see, for example, J. A. Ziegler, "Interurban Cycle Differentials and Fiscal Behavior," *National Tax Journal*, March 1572, pp. 91–95), the regressions for individual States have also been run using personal income for each state in place of the GNP gap. These regressions yield essentially the same results as the regressions discussed in the text.

[20] As previously indicated in this paper, as in the 1974 and 1975 *Reports*, state and local full employment expenditures are assumed to be the same as actual expenditures.

full employment surpluses which largely offset the increasing stimulus provided by the Federal full employment budget. In 1972, when the Federal full employment deficit moved toward stimulus by almost $9 billion, the state and local full employment surplus increased by $8 billion so that the full employment surplus for the total government sector moved toward stimulus by less than $1 billion. Even in 1973 when the state and local full employment surplus swung toward stimulus by more than $4 billion, it partially offset the movement toward restraint of over $13 billion in the Federal full employment budget. Thus it is no longer possible to ignore the impact of the state and local full employment surplus on the degree of fiscal stimulus or restraint provided by the total government sector.

As previously indicated, Rafuse and Sharp [21] have argued that the behavior of state and local government budgets is not in general cyclically perverse. In one respect the findings in this paper support that view: increases in the gap between actual and potential GNP do tend to reduce state and local receipts. However 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 fails to reach potential so that state and local governments are in fact actively cyclically perverse.

It has often been argued that Federal grants to state and local governments are ineffective for stabilization purposes because of the long and uncertain lags before these grants affect state and local expenditures. However, the findings in the present study indicate that state and local governments change their tax rates quite quickly in response to changes in the GNP gap so that Federal grants could be used effectively to forestall increases in state and local tax rates when actual GNP falls short of potential. In addition, the administrative lag for Federal grants might be reduced by including some measure of the GNP gap in determining the overall level of general revenue sharing payments.

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[21] *Op. cit.* See footnote 2, p. 22.

COMMENTS ON VOGEL'S "THE RESPONSIVENESS OF STATE AND LOCAL RECEIPTS TO CHANGES IN ECONOMIC ACTIVITY: EXTENDING THE CONCEPT OF THE FULL EMPLOYMENT BUDGET"

By Edward M. Gramlich*

The Vogel paper attempts to improve on the Council of Economic Advisers' method of calculating a full employment surplus for state and local governments. This surplus is supposed to be added to the Federal full employment surplus to derive a measure of the restrictiveness of governmental budget policy as a whole. For those who believe in such an exercise, Vogel has done a good job. For those who don't, in which category I place myself, Vogel has provided new ammunition.

The Federal full employment surplus derives its importance and usefulness from two basic propositions:

(a) The Federal Government, unlike any other sector, should try to stabilize the economy;

(b) Since Federal revenues and some expenditures respond automatically to cyclical income changes, it is impossible to get a good picture of the appropriateness of fiscal stabilization policy without computing a full employment surplus.[1]

Neither of these propositions is true for state and local governments, or for that matter any sector other than the Federal Government. It is by now a truism that state and local governments should not even try to conduct stabilization policy. On the one hand, their multipliers would be very low because most proceeds of a tax or expenditure change would alter spending and incomes outside of their districts. On the other hand, communities engaging in contra-cyclical fiscal policy could burden themselves with an external debt and high subsequent tax rates which would encourage prospective residents to locate elsewhere.[2] Rather, governments should be free to optimize in their own particular way; if they have money, whether from a cyclical boom or revenue sharing, they should spend or reduce taxes; if not, they should tax or reduce expenditures. Short-run budgetary surpluses and deficits would develop from time to time, but the long run response of an appropriately measured general government current-account surplus or deficit to any outside change would be approximately zero.[3]

These considerations suggest that the whole exercise of computing a full employment surplus for state and local governments makes little sense. The Federal Government, and only the Federal Government,

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[1] In fact, even this measure is not the best measure of the expansionary impact of Federal fiscal policy. The most appropriate measure has been derived by Alan S. Blinder and Robert M. Solow, "Analytical Foundations of Fiscal Policy," Blinder, *et al, The Economics of Public Finance*, Brookings, 1974.

[2] Wallace E. Oates, in *Fiscal Federalism*, Harcourt Brace, 1972, Chapter 1, treats this point more rigorously.

[3] I have spent more time than I care to imagine trying to figure out how all this should work. See "State and Local Governments and their Budget Constraint", *International Economic Review*, June 1969; and "State and Local Fiscal Behavior and Federal Grant Policies," with Harvey Galper, *Brookings Papers on Economic Activity*, 1:1973.

is the sector for which we want to evaluate stabilization policy. The state and local sector should no more be included in this evaluation than should the corporate, household, or foreign sectors. In each case the Federal Government should offset any alterations in spending behavior which threaten to lead to cyclical movements, and in no case would we aggregate sectoral saving with that of the Federal Government.

Similar reasoning suggests that even if it were desirable to compute a full employment surplus for the state and local sector, such a computation would be rather elusive. For 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.

I don't mean to take my frustration out on Vogel, who has written a good paper. My disagreements with it stem from the fact that I do not see much logic in the exercise he is engaged in. Nor do I agree with his acceptance of the Council's assumption that there should be no expenditure adjustments. (If the reason is that response lags are longer for expenditures, let it be argued on that basis, but I still don't believe them to be longer than for, say, property taxes.) At the same time, I do wholeheartedly agree with his notion that cyclical changes in state and local tax rates must be allowed for in making these calculations—the crucial differences between his method and the Council's. Thus by allowing state and local governments to give away some of the full employment surpluses in the form of lower tax rates, he is in my view closer to the truth than the Council, but not as close as if he had allowed governments the chance to give away more of their full employment surplus via higher expenditures.

More specifically, the actual method Vogel uses is to estimate

(1)
$$R = R_0 e^{rt} P^a P_1^a \frac{Y^{a_2}}{Y^*},$$

where R is total state and local revenue in nominal terms, R_0 is a constant, r is an estimated time trend, P is the GNP deflator, Y is actual GNP, and Y^* is full employment GNP. He then computes full employment revenues by assuming $Y = Y^*$ and uses a_2 to indicate how much higher actual revenues ought to be. This method does give lower full employment revenue totals than those of the Council, but there is no obvious reason why it should. I find the following matters troubling:

(a) I would vastly prefer Vogel's form that defined the dependent variable to be net of grants and social insurance contributions. These items clearly are independent of the business cycle because grants are determined at the Federal level, and because pension fund contributions are determined by state and local wages,

which he has already assumed to be exogenous. The only reason for using the total revenue equation is that it shows less serial correlation; but Vogel has already adjusted for that through his residual correction. In using the total revenue version, he is discarding useful *a priori* information.

(b) Allowing the GNP deflator to have an unconstrained coefficient does not make a great deal of sense. Since the dependent variable is in nominal terms the coefficient of the log of the GNP deflator, a_1, should presumably be unity. Vogel could easily force it to be so by explaining revenues in real terms and dropping the GNP deflator from the right side. By allowing it to be greater than unity (its value is 1.4) Vogel risks using the deflator to explain movements in the dependent variables which are really due to something else. (I wouldn't find the case persuasive, but he could be arguing that, as with Federal revenues, state and local revenues are progressive and rise disproportionately in inflationary times.)

(c) It is obviously stretching things, though possibly all right for these purposes, to let a time trend account for the entire noncyclical change in real revenues, as Vogel has done.

REPLY TO EDWARD M. GRAMLICH'S COMMENTS

By ROBERT C. VOGEL

It is well known, as Gramlich points out, that State and local governments should not engage in stabilization policy. This, however, does not imply that it is not useful to examine saving (or dis-saving) by various sectors, including the State and local sector, to ascertain their contributions to achieving the goals of stabilization policy. One way to engage in such an exercise is to estimate what the amount of saving (or dis-saving) by each sector would be at full employment and to see if this is consistent with achieving full employment. There are, of course, other approaches to the problem of stabilization, such as the large econometric models which attempt to portray the structure of the economy, but these models have not been particularly successful in dealing with the State and local sector.[1]

State and local government receipts, like the receipts of the Federal Government, respond automatically to changes in GNP. With a given set of tax laws, receipts will be lower if actual GNP falls short of potential than if it reaches potential, and how much lower depends on the elasticity of each tax base with respect to GNP and the elasticity of receipts with respect to each tax base. These automatic responses must be taken into account in estimating what the amount of saving (or dis-saving) by the Federal and State and local sectors would be at full employment, that is, the full employment surplus (or deficit).

In addition to these automatic responses, there may be induced changes in receipts as statutory tax rates are changed in response to deviations of actual GNP from potential. For the Federal Government, these induced changes in tax rates are expected to be stabilizing and are called fiscal policy. For State and local governments, on the other hand, these induced responses are not necessarily stabilizing and are not usually called fiscal policy, but this does not imply that such responses should not be closely examined. In particular, Gramlich's argument that "the long run response of an appropriately measured general government current-account surplus or deficit to any outside change would be approximately zero" misses the point for two reasons. First, matters of stabilization are largely, if not entirely, short-run matters. Second, despite the apparent short lag for induced changes in tax rates, State and local surpluses and deficits (measured in a variety of ways) have persisted over a period of years on various occasions. On the other hand, I agree with Gramlich that it is less than ideal to aggregate the Federal and State and local sectors, but I am then concerned with how the Federal and State and local sectors can be disentangled, given the large and growing importance of Federal grants to State and local governments. As previously mentioned, efforts to deal with the State and local sector in the context of macro-econometric models have not been particularly successful.

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[1] See, for example, Charles R. Nelson, "The Prediction Performance of the FRB-MIT-PENN Model of the U.S. Economy," *American Economic Review*, December 1972, pp. 902-917.

The distinction between automatic and induced responses can be extended to State and local government expenditures. As indicated in my paper and in the 1974 *Economic Report of the President*, the reason for assuming, as a first approximation, that State and local full employment expenditures are the same as actual expenditures is that, unlike Federal expenditures, State and local expenditures do not respond automatically to changes in economic activity. There may be, as Gramlich argues, induced changes in State and local expenditures when actual GNP deviates from potential, but this possibility has been suggested in the 1975 *Economic Report of the President* and emphasized in my paper as an important topic for future research.

Returning to the issue of State and local receipts, Gramlich states that there is no obvious reason why my method for estimating full employment receipts should give lower totals than the method used by the Council of Economic Advisers. The reason is that the CEA has failed to take into account the systematic behavior of observed State and local tax rates. Observed tax rates are higher the farther actual GNP is below potential, so that using observed tax rates as full employment tax rates leads to an overestimate of State and local full employment receipts.

For calculating the State and local full employment surplus, it is not particularly important whether the behavior of observed tax rates is due to inelasticity or to induced changes in tax rates. However, this question has important implications for stabilization policy, and this is a significant aspect of my paper which Gramlich seems to neglect. According to conventional wisdom, Federal grants are not an effective device for stabilization policy because of the long lag before these grants affect State and local expenditures.

If, however, induced changes in State and local tax rates not only occur but also occur quickly, then Federal grants can be an effective weapon of stabilization policy by forestalling the increases in State and local tax rates which would otherwise occur when actual GNP falls short of potential. Thus, it is disappointing that Gramlich has not chosen to review the evidence which I have offered in support of the existence of these induced changes in State and local tax rates. In fact, Gramlich's argument that it is preferable to define the dependent variable as receipts net of grants and contributions for social insurance, rather than total receipts, suggests that he has missed one of the main points. Gramlich argues that net receipts is preferable because a residual correction has been used to adjust for serial correlation and because using total receipts discards the *a priori* information that grants and contributions for social insurance are exogenous. However, this ignores the fact that it is better to explain serial correlation than to adjust for it. Moreover, on the basis of the substantial serial correlation in the regression for net receipts and in the regressions for the components of total receipts, as well as the inferiority of the component regressions in explaining total receipts, it has been argued that the components of total receipts are determined simultaneously and cannot properly be analyzed individually unless the regressions are respecified to take into account receipts from the other components. If the behavior of observed State and local tax rates were due only to inelasticity, there would be no reason to expect such interaction. Two additional findings also support the existence of

induced changes in State and local tax rates: (1) the correlation between observed corporate tax rates and the GNP gap, which cannot be due to inelasticity; and (2) the increase in property tax receipts when actual GNP falls short of potential.[2]

Gramlich makes two final points: (1) the coefficient for the GNP deflator seems unreasonably large and should be constrained to equal one by explaining revenues in real terms; and (2) a time trend is inadequate to account for the entire noncyclical change in real revenues. With respect to the first point, regressions were subsequently run covering the period 1955 through 1974 (those in the paper cover only 1955 through 1971), and these reveal that the coefficient for the GNP deflator is no longer significantly different from one. In addition, the coefficient for time is slightly increased, while the coefficient for the GNP gap is not appreciably changed. Thus, these regressions not only eliminate the anomalous coefficient for the GNP deflator but also reinforce the accuracy of the coefficient used to estimate State and local full employment receipts. With respect to the second point, the findings of Nelson previously noted indicate that an autoregressive moving average outperforms the FRB–MIT–PENN model in explaining the behavior of state and local expenditures.

[2] The short lag for induced changes in State and local tax rates, which might be considered implausible, can be explained by the fact that State and local governments have continually been raising their tax rates so that it is only the size of the increase in tax rates which varies with the gap between actual and potential GNP.

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