The Measurement and Importance of Fiscal Policy Changes

By E. GERALD CORRIGAN*

During the last several years the debate over how monetary and/or fiscal policies can be most appropriately measured has intensified. For the most part, this debate has arisen in the context of attempts to estimate the impact of changes in policy on the level of economic activity. The difficulty in estimating such impacts arises because many of the widely used policy indicators reflect the effect of changes in economic activity as well as changes in policy. As a result, these relationships are often clouded by the feedback from economic activity to the policy measure. With respect to fiscal policy, for example, it is generally agreed that the national income account (NIA) budget surplus (or deficit) is not a good indicator of fiscal policy because the NIA budget position is quite sensitive to changes in the level of economic activity.

In an effort to avoid the feedback problem, the full employment surplus (FES) is often used to measure changes in fiscal policy. This measure is constructed in a way which eliminates at least some of the effects of changes in the economy on the budget position. In this paper an alternative measure of changes in fiscal policy —the initial stimulus (IS)—is presented, and it is argued that the IS has distinct advantages over both the FES and the NIA budget as a measure of the impact of fiscal policy changes on the economy.

The first section of the paper consists of an examination of the theoretical structure of the FES and the IS as well as a comparison of the procedures used to construct these measures. On the basis of this discussion, it is argued that the IS is a more useful indicator of short-run changes in discretionary fiscal policy. Then, in the second section, the FES and IS measures are empirically tested in order to determine which provides a better statistical explanation of changes in gross national product (GNP). This analysis indicates that the association between changes in GNP and changes in fiscal policy as measured by the IS is consistently greater than is the case with the FES. The last part of the study reexamines the question of the relative importance of monetary and fiscal policy in the determination of GNP. This investigation suggests that some recent studies on this subject appear to have overstated the case against fiscal policy, since the results presented here show that fiscal policy as measured by the IS does exert significant influence, in the expected direction, on GNP.

A COMPARISON OF FISCAL POLICY INDICATORS

As noted above, it is generally agreed that the NIA budget is not a reliable indicator of changes in fiscal policy because of the impact of variations in the level of economic activity on the budget position and, in particular, on budget receipts. To illustrate this, consider a period in which expenditures and tax rates are unchanged but the level of economic activity decreases, thereby inducing a reduction in tax revenues. Under such conditions, the NIA budget surplus would decrease (or the deficit would increase), thereby suggesting a more expansionary fiscal policy. Clearly, it would be misleading to interpret such a move in the budget position as a shift in Government policy toward a more stimulative budget

* The author, who is chief of the Domestic Research Division, wishes to acknowledge the helpful comments provided by Richard G. Davis, Michael J. Hamburger, Robert G. Link, A. Marshall Puckett, Frederick C. Schadrack, H. David Willey, and other colleagues at the Federal Reserve Bank of New York. In addition, the data processing assistance of Linda Mandle, Susan Skinner, and Stephen Thieke is acknowledged. The views expressed in this paper are the author's alone and do not necessarily reflect those of the individuals noted above or the Federal Reserve Bank of New York.

position.[1] The FES measure[2] was originally designed to circumvent problems arising from the influence of changes in economic activity on the budget position by estimating budget receipts and expenditures independently of current changes in the level of economic activity. Consequently, the FES measure can be viewed as a superior indicator of changes in discretionary fiscal policy. However, it will be argued in this paper that the FES does not in fact eliminate the problems of endogenous dependence and, as a consequence, does not provide a good measure of fiscal impact. To shed light on the origins of the shortcomings in the FES, and at the same time point out the advantages of the IS, both measures are described in detail below.

THE FULL EMPLOYMENT SURPLUS. The FES is an estimate of the overall NIA budget at some arbitrarily defined full employment level of economic activity. By estimating the level and/or change in budget receipts and expenditures at an income level consistent with full employment, the FES seeks to eliminate the effects of current variations in income levels on the budget position and thereby to provide a measure of the direction and magnitude of discretionary fiscal policy changes.[3]

Since the FES data are designed to reflect only discretionary Federal expenditures and receipts, the actual budget data must be adjusted in order to remove the effects of current changes in income levels. On the expenditures side, the necessary adjustment is small since virtually all Federal outlays are assumed to be discretionary. The one exception is Federal unemployment compensation benefit payments, which are adjusted to eliminate changes in these payments arising from any deviations in actual employment from "full employment".[4] As a consequence, during periods of substantial unemployment such as 1961, the level of full employment outlays may be less than "actual" expenditures by as much as $2 billion to $3 billion. Usually, however, the FES expenditures data and the "actual" data on Federal outlays, particularly when measured as quarterly changes, are quite similar.

In sharp contrast to the expenditures data, the computation of FES receipts represents a significant departure from "actual" receipts data. Full employment receipts measure the level of tax receipts over time on the assumption that full employment was constantly maintained. This is done by selecting a base year representing full resource utilization and projecting a trend growth in real output from that base. The resultant levels of real GNP are then restated in current dollars by inflating them with actual values of the GNP deflator. Given these levels of nominal full employment GNP, the next step in the process is the allocation of this income total among the full employment income shares as they appear in the national income accounts. These shares include personal income, its wages and salaries component, and corporate profits. The shares are assumed to be subject only to secular change, and their estimated magnitudes are based on observed values in years of actual high employment. (This assumed pattern of income distribution is one of the more questionable elements in the estimation of the FES.) The assumed income shares are multiplied by the estimated full employment GNP to yield quarterly levels of full employment personal income, wages and salaries, and corporate profits.

The final step in the computation of full employment receipts is the application of average tax rates for social security, personal income, and corporate profits to these income figures. The tax rates are based on actual NIA tax payments relative to the three income shares noted above in high employment periods. These tax rates are adjusted when autonomous changes in tax rates occur, and it is through these adjustments that the effects of autonomous tax rate change enter into full employment receipts.

The products of the tax rates and the full employment income shares determine full employment tax receipts based on personal income, social security, and corporate

[1] Such a swing in the budget position is, of course, indicative of the automatic stabilization features of the budget. However, such movements are not the subject of this analysis.

[2] The concept of the FES was originally developed at the Council of Economic Advisers in the early 1960's. For more recent studies of this measure, see Keith M. Carlson, "Estimates of the High Employment Budget: 1947-1967", *Review* (Federal Reserve Bank of St. Louis, June 1967), pages 6-14, and Arthur M. Okun and Nancy H. Teeters, "The Full Employment Budget Surplus Revisited", paper delivered at the First Conference of the Brookings Panel on Economic Activity, April 17, 1970, Washington, D.C.

[3] In addition, many writers have used the FES as an analytical tool in setting targets for planned fiscal actions. Under this reasoning, the size of the FES relative to private savings and investment provides an approximation of what the actual budget position must be if full employment is to be attained. See Keith M. Carlson, "Estimates of High Employment Budget: 1947-1967", *op. cit.*, page 12, and William H. Oakland, "Budgetary Measures of Fiscal Performance", *Southern Economic Journal* (April 1969), page 348.

[4] See Nancy H. Teeters, "Estimates of the Full Employment Surplus, 1955-1964", *Review of Economics and Statistics* (August 1965), pages 309-10. Also, using a calculation procedure different from that described above, a more detailed treatment of the problems and implications associated with the assumption that Federal expenditures are discretionary is provided in Michael E. Levy, *Fiscal Policy, Cycles and Growth*, Studies in Business Economics #81 (New York: National Industrial Conference Board, 1963), pages 91-92.

incomes. The sum of these items plus indirect tax receipts, which are projected on the basis of a trend adjusted for rate changes, is defined as total full employment budget receipts, and FES is the difference between full employment receipts and expenditures.

Despite its superiority over the NIA budget, the FES has some serious defects. In the first place, this measure is clearly very difficult to estimate and construct since the computational procedures involve several necessarily tenuous assumptions about the growth of real and nominal income as well as the pattern of income distribution. Moreover, it seems preferable to measure the impact of tax rate changes at prevailing income levels rather than at full employment, since the revenue effects of a given tax rate change would be overstated on the full employment basis if the economy were operating at less than full employment at the time of the rate change.

However, the most serious defect of the FES is the upward trend in full employment receipts resulting from their relation to the full employment growth in nominal incomes. Given the trend growth in full employment receipts the FES would register an increase even in periods when tax policies and expenditures were unchanged. Clearly this increase in the surplus would not reflect a change in discretionary fiscal policy.[5] Thus, the FES data have an upward bias—a bias tending to overstate the degree of restraint—which is particularly evident in periods of inflation.[6] That is, the size of the bias will vary with the size of the GNP deflator, since real full employment GNP is inflated by the magnitude of the GNP deflator. Moreover, because the behavior of the deflator is irregular, the pattern of impact on budget receipts arising from this source also tends to be irregular.[7] In any case, since the deflator is clearly dependent on developments within the economy, its use in the computation of full employment revenues introduces a large and volatile element of endogenous dependence into the FES data. An insight into the quantitative significance of this bias can be gained by comparing the growth in full employment receipts during the fourth quarters of 1967 and 1968. Since in both of these periods there were no autonomous or discretionary changes in tax rates, the change in full employment receipts reflects only the growth in budget revenues resulting from the rise in nominal full employment income. Yet in the first period (1967-IV) full employment receipts rose by $3.1 billion (annual rate), while in 1968-IV the growth in revenues was $4.5 billion. For the most part, the difference between these magnitudes is attributable to the fact that the deflator was increasing at a more rapid rate in the latter period.

THE INITIAL STIMULUS MEASURE. Due to the shortcomings in the FES, an alternate measure of fiscal impact—the IS—was developed at this Bank about five years ago.[8] This earlier work, with some modifications, is the basis for this present study. Unlike the FES, the IS does not depend on an estimate of some overall budget based on calculated levels of full employment. Rather, this measure merely seeks to identify and quantify those elements in the Federal budget that represent changes in discretionary fiscal policy. The IS (or restraint) is simply the algebraic sum of the initial effects of changes in Federal expenditures and the initial effects of changes in Federal tax policies on an accounting basis which is generally similar to the NIA budget.[9]

The expenditures component of the IS is the quarter-to-quarter change in total Federal outlays as recorded in the NIA budget. Thus, the expenditures variable implicitly assumes that all Federal outlays are discretionary—that is, they are not influenced by changes in the level of economic activity. This assumption is similar to that made in the computation of the full employment expenditures. However, the IS expenditures data do not attempt to

[5] The rise in full employment receipts which occurs as a result of the growth of full employment income is, of course, quite important over time in that it may provide a measure of the "fiscal dividend" arising from economic growth. Thus, within the framework of longer term budget planning the FES may indeed be a useful tool of analysis since it does allow for this element.

[6] On this point, see Frank de Leeuw and John Kalchbrenner, "Monetary and Fiscal Actions: A Test of Their Relative Importance in Economic Stabilization—Comment", *Review* (Federal Reserve Bank of St. Louis, April 1969), pages 6-8. Also for a more detailed comparison of the IS and the FES which also provides further insight into the upward bias question, see E. G. Corrigan, "Budgetary Measures of Fiscal Performance—A Comment", *Southern Economic Journal* (April 1970), pages 470-73.

[7] In their recent paper, Okun and Teeters (see footnote 2) have suggested a technique for minimizing this source of disturbance by inflating full employment real GNP by a measure of "potential price change" rather than with the actual values of the GNP deflator.

[8] "The Initial Effects of Federal Budgetary Changes on Aggregate Spending", *Monthly Review* (Federal Reserve Bank of New York, July 1965), pages 141-49. More recently a similar measure has been developed by William H. Oakland, "Budgetary Measures of Fiscal Performance", *Southern Economic Journal* (April 1969), pages 348-58.

[9] This measure may, of course, be constructed on the basis of the unified cash budget as well as the NIA budget. However, differences in budget coverage and in the timing of various expenditures and receipts items will result in some disparities between the two measures.

eliminate changes in Federal unemployment compensation payments arising from deviations in actual employment from full employment, an adjustment which is made in calculating the full employment expenditures data. Thus, the expenditures components of the FES and the IS differ only to the extent that they treat Federal payments for unemployment compensation differently. Subsequent analysis reported in this paper suggests that this difference is not significant enough to warrant the additional computational problems involved in making the adjustment required to remove this element of endogenous dependence in the IS data.

On the revenue side, the IS and the FES measures are distinctly different. The IS receipt component measures the initial dollar impact of discretionary changes in individual, corporate, social security, and indirect tax rates and/or bases. In general, the amount of this impact is based on the effect of the tax change on NIA budget receipts, at the prevailing income level. However, in some instances, the timing of this impact is modified to reflect judgments about when the effect of the tax change actually took place rather than when the initial impact was recorded in the NIA budget. For example, since corporate taxes in the NIA budget are measured on an accrual-liability basis, the corporate tax receipts attributable to the 10 percent surtax are first recorded in this budget in 1968-I because of the retroactive features of the tax. However, since the legislation was not passed until June, nor were any payments made until 1968-III, the initial impact of this tax change was not recorded until the third quarter of 1968 in the IS data. In short, the value of the change in the tax component of the IS is equal to zero except in quarters when a tax is introduced, modified, suspended, or eliminated.

The calculation of the tax component of the IS provides two distinct advantages over the computation of full employment receipts. First, the IS tax component can be computed with relative ease since the "initial effects" of tax rate changes are published in several sources at the time tax changes take effect.[10] Thus, the IS eliminates the tenuous process of constructing a tax measure on the basis of assumed full employment levels of income and assumed patterns of distribution at those income levels. More importantly, however, the IS eliminates the trend growth in revenues arising from the growth in real full employment GNP and the change in revenues resulting from changes in the rate of inflation. In short, the IS receipts data go beyond the FES data in removing the effects of the economy on budget receipts.

For a particular period, the net change in the IS (or restraint) is the sum of the change in expenditures and the revenue effect of the change in taxes. The tax data are assigned algebraic signs according to their effects on the economy rather than their effects on budget receipts—i.e., a tax decrease is given a positive sign and a tax increase a negative sign. Thus, changes in fiscal stimulus or restraint are stated in terms of the initial impact of expenditures changes and the initial effect of tax policy changes.

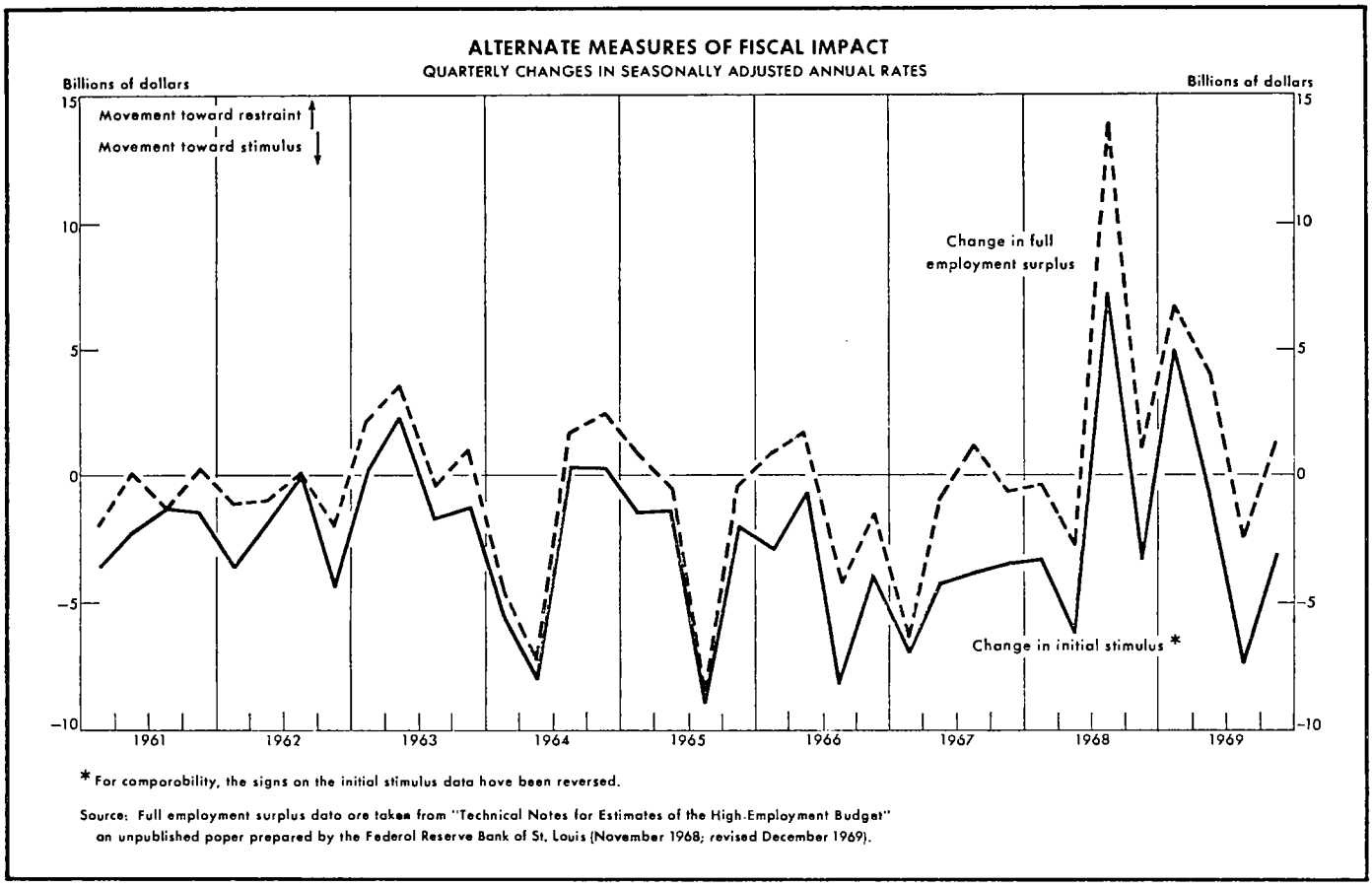
Despite the fact that the IS and the FES are designed to indicate the direction and magnitude of discretionary fiscal policy changes, they often give significantly different views of budgetary impact. To illustrate these differences, quarterly changes in the IS and the FES are shown in the chart for 1961-69.[11] An examination of these data indicates that the IS and the FES often give quite different estimates of fiscal impact, not only in terms of the amount of the impact but often in terms of the direction of change as well. For example, ten of the thirty-six observations of fiscal impact shown in this chart have different signs and eleven of the remaining cases differ in quantitative terms by more than $2.0 billion.

EMPIRICAL TESTS OF FISCAL IMPACT MEASURES

The prior analysis has suggested that the FES data contain a large and irregular growth in receipts resulting from the trend growth in real full employment GNP and the inflation of these magnitudes with actual values of the GNP deflator. Thus, it was argued that the IS should be a more useful indicator of short-run changes in discretionary fiscal policy. In testing this hypothesis, a number

[10] These sources include the *Annual Report of the Secretary of the Treasury*, the *Federal Budget*, the *Survey of Current Business*, and the *Congressional Record*. Thus, even in the case of the recently legislated tax reform bill, detailed estimates of the "initial effects" of the various provisions were published in the *Congressional Record*, Senate, December 22, 1969, pages 17590-97. It should be noted that, since the tax data are based on the dollar impact of changes in tax policies at prevailing income levels, forecasts of this dollar impact for tax changes which may be staged over long periods have to be adjusted for the prevailing income level at the time each stage takes effect.

[11] In all cases, these data are shown as quarter-to-quarter changes in budget or fiscal impact positions because it is the change in budget position rather than the level that is of significance when considering the impact of fiscal policy on the size and direction of change in the economy.



of multiple regressions were estimated to determine which set of fiscal variables suggested the closer association between changes in fiscal policy and changes in GNP. The statistical analysis consisted of multiple regression equations relating quarterly changes in current-dollar GNP to current and lagged quarterly changes in the IS and the FES. In most of the work, the receipts and expenditures components of the two fiscal impact variables were separated, but it was also found that consistent, though poorer, results were obtained when the tax and expenditures components were combined into net measures of fiscal impact.

In order to pursue this analysis, attention had first to be directed at the length of the lags to be allowed for in estimating the influence of the fiscal variables on GNP. To make this judgment, experiments with the tax and expenditures components of the IS were made in an effort to determine which lag structure would maximize the explanatory power (R^2) of these variables.[12] These experiments showed that, in general, a lag structure incorporating the current and seven prior quarters on the expenditures variable and the current and six prior quarters on the tax variable was optimal. Accordingly,

[12] This involved varying the length of the distributed lag on one variable—say G—holding the length of the lag on the second variable—T—constant. This test was originally made for all combinations of lags from four to ten quarters in duration prior to the 1969 summer revisions of the NIA. However, spot checks with the revised data suggest that these data revisions have not affected the results cited above. A similar test with the FES data was made to determine whether they maximize the R^2 with a different lag structure from the one found best with the IS. While some very slight differences in lag patterns were present, the general pattern suggests that the optimal lag structures are not significantly different from those cited above and in no way influence the general conclusions reached in this analysis.

an equation using this lag structure and relating changes in GNP to current and lagged values of the expenditures and tax[13] components of the IS was fitted to data for the period 1952-I to 1968-IV. This is shown as equation (1) in Table I. A similar equation using the FES data[14] was also fitted to data for the same time period —equation (2)—and both sets of data were then tested for a number of other time periods in order to evaluate the stability of the relationship depicted in equations (1) and (2). Summary statistics for these time periods are shown in Table II.

An examination of the data in Tables I and II provides strong support for the hypothesis that the IS is a better indicator of the effects of fiscal policy on GNP, since in all cases the association between changes in fiscal policy as measured by the IS is higher than is the case with the FES.[15] Similar results were also obtained when the expenditures and tax components of these measures were combined and entered on the right side of the equations as single measures of net fiscal impact.[16] Notwithstanding this point, a further examination of equations (1) and (2) and the summary statistics in Table II indicates that both measures behave similarly in several important ways. For example, when the period of fit is shortened to include only the 1950's or early 1960's, the R^2's are marked by a sharp decline. Indeed, there is virtually no correlation between changes in GNP and changes in the FES data during the fifties. In general, this behavior appears to reflect the relatively greater emphasis on the balanced budget fiscal policy that characterized that period.[17] However, despite the poorer fit for these earlier periods, the magnitudes of the respective multipliers (the sum of the regression coefficients) remain reasonably constant. It should also be noted that both the FES and IS measures show that the maximum response to receipts and/or tax rate changes does not occur until the fourth or fifth quarter after the change, while the peak response to

Table I

CHANGES IN GNP REGRESSED ON ALTERNATIVE FISCAL VARIABLES

Lag period	Initial stimulus (IS) data Period of fit 1952-I to 1968-IV		Full employment data Period of fit 1952-I to 1968-IV	
	(1) $R^2/\bar{R}^2$ = .4866/.4540 SE = $4.8 billion DW = 1.3		(2) $R^2/\bar{R}^2$ = .3433/.3016 SE = $5.5 billion DW = 1.1	
	Lag weights		Lag weights	
	ΔG	ΔT	ΔFEE	ΔFER
t	.3904* (2.3)	—.2280 (0.9)	.5400* (2.7)	.5479* (2.6)
t-1	.4123* (3.9)	.3621* (2.1)	.4792* (3.6)	.0317 (0.2)
t-2	.4179* (5.9)	.7918* (5.1)	.4185* (4.3)	—.3564* (2.3)
t-3	.4071* (6.1)	1.0610* (6.2)	.3581* (3.9)	—.6186* (3.2)
t-4	.3800* (4.9)	1.1698* (6.4)	.2979* (2.9)	—.7492* (3.6)
t-5	.3367* (3.9)	1.1180* (6.4)	.2379* (2.2)	—.7538* (3.7)
t-6	.2770* (3.3)	.9058* (6.3)	.1781 (1.7)	—.6304* (3.8)
t-7	.2009* (2.9)	.5331* (6.2)	.1185 (1.4)	—.3791* (3.8)
t-8	.1086* (2.6)		.0591 (1.2)	
Σ	2.9314	5.7139	2.6878	—2.9063

R^2 = Coefficient of determination.
$\bar{R}^2$ = Coefficient of determination (adjusted for degrees of freedom).
SE = Standard error of the estimate.
DW = Durbin-Watson statistic.
ΔG = Change in the Government spending component of the IS.
ΔT = Change in the tax component of the IS.
ΔFEE = Change in full employment expenditures.
ΔFER = Change in full employment receipts.
Σ = Summation of regression coefficients.
* Coefficients significant at 5 percent level.

[13] In this and in subsequent regressions using the tax component of the IS, tax decreases are given a positive sign. Thus, the positive signs of the regression coefficients for the tax variable are reasonable.

[14] FES data were taken from "Technical Notes for Estimates of the High-Employment Budget", an unpublished paper prepared by the Federal Reserve Bank of St. Louis (November 1968; revised December 1969).

[15] In these tests using the FES, the lag structure was selected to maintain comparability with the IS which in turn was selected on the basis of maximum R^2. Testing alternate lag structures with the FES data showed a slightly higher R^2 for a lag pattern using six quarters on expenditures and taxes (.35 versus .34). However, this difference does not alter the conclusions cited in the text.

[16] For example, when △GNP was regressed on △FES for the 1952-I to 1968-IV period, using an eight-quarter lag, the R^2 was approximately .10 and the sum of the regression coefficients, i.e., the multiplier, was —1.8. In contrast, the same equation with the IS entered on the right side yielded an R^2 of .25 and the sum of the regression coefficients was 2.4. Moreover, the "t" statistics for the regression coefficients of △IS were consistently higher than was the case with △FES.

[17] The clearest incident of this type occurred in 1954 when many of the Korean war taxes expired. This loss of revenue was accompanied by sharp expenditures reductions in order to preserve the budget position despite the concurrent recession.

spending changes occurs with a shorter lag. At the same time, however, the relative size of the tax and expenditures multipliers derived from these equations does not conform to theoretical expectations. That is, the balanced budget multiplier theorem suggests that the absolute value of the spending multiplier should be greater than the tax multiplier, a condition which is not realized in these estimates.

Given the similarity in the expenditures components of the IS and the FES, the weaker association between GNP and FES as compared with that between GNP and the IS is primarily due to differences in the receipts or tax components of the two measures. However, there is also a modest difference in their expenditures components in that full employment expenditures exclude endogenous changes in Federal unemployment compensation. To test the significance of this data adjustment, and at the same time provide further evidence in support of the view that the poorer performance of the FES is related to its receipts component, regressions were estimated using full employment expenditures and the tax components of the IS as the independent variables. These results (Table II) show little difference from those obtained using the direct expenditures series ($\triangle G$) and the IS tax variable ($\triangle T$). Thus the data in Table II suggest two significant conclusions: (a) the bias in the unadjusted expenditures series ($\triangle G$) is not serious and (b) the lower value of R^2's in equations using FES rather than IS data is indeed largely the result of the shortcomings of the full employment receipts data.

TESTS OF THE RELATIVE IMPORTANCE OF MONETARY AND FISCAL POLICY

The preceding analysis suggests that the IS is a superior indicator of the direction and magnitude of short-run changes in discretionary fiscal policy. To shed light on the question of the relative importance of monetary and fiscal policy, monetary policy variables were introduced on the right side of the equations described previously. The results of this experimentation have a significant bearing on the debate resulting from the conclusions reached by Andersen and Jordan in their examination of the relative impact of monetary and fiscal policy.[18]

Using distributed lag multiple regression equations which related quarterly changes in GNP to quarterly changes in monetary and fiscal policy variables, Andersen and Jordan concluded that the response of economic activity to monetary actions relative to fiscal actions is (1) larger, (2) more predictable, and (3) faster. From a quantitative point of view, the Andersen-Jordan results were startling to many in two ways. First, their estimates of the degree of association between changes in GNP and changes in the monetary aggregate (usually the narrow

[18] Leonall C. Andersen and Jerry L. Jordan, "Monetary and Fiscal Actions: A Test of Their Relative Importance in Economic Stabilization", *Review* (Federal Reserve Bank of St. Louis, November 1968), pages 11-23.

Table II

CHANGES IN GNP REGRESSED ON ALTERNATIVE FISCAL VARIABLES FOR SELECTED TIME PERIODS

Lag period	Initial stimulus (IS)				Full employment surplus				Full employment expenditures and initial stimulus taxes			
	$\bar{R}^2$	SE	Multipliers*		$\bar{R}^2$	SE	Multipliers*		$\bar{R}^2$	SE	Multipliers*	
			ΔG	ΔT			ΔFEE	ΔFER			ΔFEE	ΔT
1952-I – 1968-IV	.4540	4.8	2.9	5.7	.3016	5.5	2.7	—2.9	.4536	4.8	2.9	5.6
1952-I – 1969-II	.3605	5.2	2.6	3.9	.2414	5.7	1.7	—0.7	.3574	5.3	2.5	3.8
1952-I – 1960-IV	.1966	5.0	2.6	4.8	.1019	5.2	2.6	—3.5	.1880	5.0	3.0	5.8
1961-I – 1968-IV	.3838	4.0	2.6	4.3	.2873	4.3	2.8	—2.8	.3562	4.1	2.5	4.0
1952-I – 1963-IV	.1815	4.8	2.7	5.3	.0927	5.1	2.3	—3.1	.1712	4.9	2.7	5.6
1952-I – 1966-IV	.3956	4.7	2.4	5.3	.3361	4.9	2.4	—4.5	.4075	4.6	2.3	5.1
1953-I – 1963-IV	.1844	4.9	2.4	5.6	.0932	5.1	1.8	—2.5	.1789	4.9	2.3	5.6

* The multipliers are the sum of the regression coefficients for the respective variables.
$\bar{R}^2$ = Coefficient of determination (adjusted for degrees of freedom).
SE = Standard error of the estimate.
ΔG = Change in the Government spending component of the IS.
ΔT = Change in the tax component of the IS.
ΔFEE = Change in full employment expenditures.
ΔFER = Change in full employment receipts.

money supply), as indicated by the R^2 in the reduced-form equations, often exceed .50—suggesting that more than 50 percent of the variance of changes in GNP is associated with changes in the monetary aggregate. Even to many who agree that money is important, these estimates seemed surprisingly high. A second and perhaps more disturbing quantitative aspect of these results was that fiscal policy had virtually no net impact on changes in GNP. Indeed, according to Andersen and Jordan, "either the commonly used measures of fiscal influence do not correctly indicate the degree and direction of such influence or there was no measurable net fiscal influence on total spending in the test period".[19] Moreover, the Andersen-Jordan results have persistently shown that changes in tax policies (as measured by high employment receipts) are of such little importance that tax policy is not even included among the policy instruments in the more recent work published by the St. Louis Reserve Bank.[20]

As a consequence of these conclusions, the Andersen-Jordan technique and results have been subjected to careful scrutiny in an attempt to clarify the issues raised by their analysis. For example, it has been argued that the surprisingly high association between money and GNP is, at least in part, a reflection of common trends in GNP and the monetary aggregates, particularly during the 1960's.[21] However, the bulk of the criticism levied against the Andersen-Jordan technique focuses on the appropriateness of the monetary and fiscal policy variables used in their equations. It has been argued that these policy variables are influenced by feedbacks from the economy as well as by changes in policy.[22] Thus, several alternative forms of the Andersen-Jordan equations have been estimated using monetary and/or fiscal variables which are said to be more independent of the level of economic activity than the variables utilized in the Andersen-Jordan study. While the results of these studies have shown that fiscal policy was more important than suggested by Andersen-Jordan, the best results (in terms of the performance of the fiscal variables) were obtained in equations using nonborrowed reserves (NBR) as the monetary variable. However, to the extent that NBR is more responsive to changes in economic activity than are other monetary indicators, these results must be discounted. In this regard, recent work by Hamburger[23] has suggested that NBR is more responsive to changes in the economy than any of the other monetary aggregates. Thus, if NBR is not the most appropriate monetary variable to be used in these reduced-form equations, the Andersen-Jordan results regarding fiscal policy have not been seriously undermined by their critics.

The analysis and results in the following pages present some new evidence regarding the importance of fiscal policy, particularly tax changes. It will be demonstrated, using the IS data, that tax changes do in fact have a significant influence on total spending and that Andersen and Jordan appear to have overstated the case against fiscal policy in general. These results do not, however, detract from the basic Andersen-Jordan position that money is of considerable importance in explaining changes in current income.

The general technique used in this analysis closely parallels that followed by Andersen-Jordan in their published work. The monetary variables used are the money supply and total reserves, the period of study is confined to 1952-I to 1968-IV, and distributed lag multiple regressions are used.[24] Alternate forms of the equations were also tested, using bank credit and NBR as the monetary variables, and some modifications of the Government spending variable were experimented with. The major differences in this study are the use of fiscal variables based on the IS rather than the FES, and the testing of lag structures with the presupposition that the fiscal and monetary impacts on GNP need not be of equal duration.

---

[19] *Ibid.*, page 22.

[20] See Leonall C. Andersen and Keith M. Carlson, "A Monetarist Model for Economic Stabilization", *Review* (Federal Reserve Bank of St. Louis, April 1970), page 11.

[21] On this point, see Richard G. Davis, "How Much Does Money Matter? A Look at Some Recent Evidence", *Monthly Review* (Federal Reserve Bank of New York, June 1969), page 123.

[22] In particular, see Frank de Leeuw and John Kalchbrenner, "Monetary and Fiscal Actions: A Test of Their Relative Importance in Economic Stabilization—Comment", *Review* (Federal Reserve Bank of St. Louis, April 1969), pages 6-8; also Lyle E. Gramley, "Guidelines for Monetary Policy—The Case Against Simple Rules", February 1969. This paper has been reprinted in *Readings in Money; National Income and Stabilization Policy*, eds. Warren L. Smith and Ronald L. Teigen (Homewood, Illinois: Irwin Inc., 1970), pages 488-95.

[23] Michael J. Hamburger, "Indicators of Monetary Policy: The Arguments and the Evidence", paper delivered at the annual meetings of the American Economic Association, New York, December 1969 (forthcoming in *American Economic Review*, Papers and Proceedings, May 1970). It should be emphasized, however, that the issue of which monetary indicator is the most appropriate—i.e., the most exogenous—is by no means settled. For example, the behavior of the currency component of the narrow money supply, which most would classify as dependent on developments within the economy, may have a sizable influence on the association between GNP and the money supply.

[24] Due to program limitations, a second-degree Almon-type polynomial is used in fitting the distributed lag pattern, whereas the Andersen-Jordan results were based on a fourth-degree polynomial. However, prior investigations have shown that this difference has little or no effect on the results obtained.

TESTS OF MONETARY AND FISCAL IMPACTS USING TOTAL RESERVES AS THE MONETARY VARIABLE. In the analysis which follows, quarterly changes in current-dollar GNP are regressed on current and lagged values of first differences in total reserves[25] and the expenditures and tax components of the IS. Initially, an equation was estimated using current and seven-quarter lagged values of the monetary and fiscal variables, the same structure used by Andersen and Jordan in their April "Reply".[26] When fitted to the 1952-I to 1968-IV period, the R^2 for this equation was .60. In contrast to the Andersen-Jordan results, this equation suggests some reaction in GNP to changes in the fiscal variables, particularly tax changes ($\triangle T$). (The tax multiplier—the sum of the regression coefficients for $\triangle T$ —was 2.6.) Prior work with the monetary and fiscal variables suggested that the lag structure incorporated in this equation was not optimal, i.e., that the R^2 could be improved by using some other structure.[27] Experimentation with various lag structures up to eight quarters in duration for the period 1952-I to 1968-IV indicated that the maximum R^2 occurred in equation (3) shown in Table III.[28] This table also presents summary statistics for alternative lag structures using the same equation specification.

A review of the coefficients in equation (3) and the summary statistics for equations (3) through (6) indicates that, when the monetary and fiscal variables are specified to have different lag lengths and when the components of the IS are substituted for the components of the FES, the conclusions reached by Andersen-Jordan concerning the importance of fiscal policy, and particularly tax changes, are considerably weakened. For example, the Andersen-Jordan results, as in equation (6) in Table III, have consistently shown that tax changes have no significant influence on GNP changes. Clearly this contention is not supported by the coefficients of the $\triangle T$ variable in (3). Similarly, the $\triangle G$ variable in equation (3) shows changes in Government expenditures having an impact on GNP in the expected direction and the coefficients of $\triangle G$ at t-1

Table III

CHANGES IN GNP REGRESSED ON CURRENT AND LAGGED VALUES OF CHANGES IN TR, G, AND T

1952-I to 1968-IV

(3) R^2 = .6971
SE = $3.8 billion
DW = 1.6

Lag period	Distributed lag weights		
	ΔTR	ΔG	ΔT
t	−1.0 (0.5)	0.1 (0.7)	0.1 (0.4)
t-1	5.7* (5.5)	0.4* (2.8)	0.3* (2.0)
t-2	9.2* (7.4)	0.4* (2.1)	0.4* (3.4)
t-3	9.4* (6.8)		0.5* (3.7)
t-4	6.3* (6.3)		0.5* (3.6)
t-5			0.4* (3.4)
t-6			0.4* (3.3)
t-7			0.2* (3.1)
Σ	29.6	0.9	2.7

Alternative specifications	Summary statistics for alternative lag structures							
	Lag† on			R^2	SE	Multipliers		
	ΔTR	ΔG	ΔT			ΔTR	ΔG	ΔT
(3)	5	3	8	.6971	3.8	29.6	0.9	2.7
(4)	8	8	8	.5985	4.3	38.5	0.5	2.6
(5)	5	6	8	.6948	3.8	36.1	0.2	1.2
(6)‡	8	8	8	.6200	3.8	43.8	0.6	−0.6

R^2 = Coefficient of determination.
SE = Standard error of the estimate.
DW = Durbin-Watson statistic.
ΔTR = Change in the quarterly average level of total member bank reserves.
ΔG = Change in the Government spending component of the initial stimulus (IS).
ΔT = Change in the tax component of the IS.
Σ = Summation of regression of coefficients. Because of rounding, components do not necessarily add to totals.
* Coefficients significant at 5 percent level.
† Lag lengths include current quarter values of respective variables.
‡ Andersen-Jordan.

[25] Due to the change in reserve requirements in April 1969, and the subsequent change in Regulation D which placed a marginal reserve requirement on Euro-dollars, the total reserves series was substantially revised in 1969. Since these data were revised only back through 1959, there is a break in the series used in this analysis which occurs between 1958 and 1959.

[26] Leonall C. Andersen and Jerry L. Jordan, "Monetary and Fiscal Actions: A Test of Their Relative Importance in Economic Stabilization—Reply", *Review* (Federal Reserve Bank of St. Louis, April 1969), page 15.

[27] In their published work, Andersen and Jordan have not tested the possibility that monetary influence has a lag different from that for fiscal influence. See Leonall C. Andersen, "An Evaluation of the Impact of Monetary and Fiscal Policy on Economic Activity", paper delivered at the meeting of the American Statistical Association (August 1969), footnote 9.

[28] Much of this testing of lag structures was originally done prior to the availability of the revised GNP data for 1966 through 1968 and prior to the revision in the total reserves data. Only selected lag structures were reestimated using the revised data. However, there was no indication of inconsistencies resulting from the new data.

and t-2 are significant at the 5 percent level.[29] However, as in earlier work, the size of the $\triangle G$ multiplier relative to the $\triangle T$ multiplier does not conform to expectations.

Aside from the relative sizes of the tax and expenditures multipliers, the other disturbing aspect of these results is the marked differences in outcomes associated with only small changes in the lag structures. For example, a comparison of the summary statistics for equations (3) and (5) indicates that extending the lag on $\triangle G$ from three to six quarters yields virtually the same R^2 reported in equation (3). However, the impact on the multipliers is considerably more dramatic and virtually eliminates the net impact of the fiscal variables.[30] In part, this is a reflection of the interaction among the independent variables at different lag structures, but more importantly it dramatically points up the specification difficulties associated with a single reduced-form equation "model" of the aggregate economy.

Summarizing the results presented thus far, the analysis has demonstrated that fiscal policy does exhibit a significant influence on GNP when the IS data are used as fiscal policy variables, total reserves as the monetary policy variable, and lag structures are selected to maximize R^2. Quantitatively, this influence manifests itself in an increase in the R^2 from .6190, when equation (3) is fitted with only total reserves included, to .6971 with both monetary and fiscal variables included.[31] However, changes in GNP regressed on the fiscal variables alone yield an R^2 of approximately .50, and the behavior of $\triangle G$ in particular is considerably stronger in formulations using only the fiscal variables. This suggests that when the fiscal and monetary variables are used together part of the fiscal impact, particularly of $\triangle G$, is being captured by the monetary variable or that the monetary and fiscal variables are not wholly independent of each other.

TESTS OF THE MONETARY-FISCAL INFLUENCE ON GNP USING THE NARROW MONEY SUPPLY. In order to test further the results cited in the preceding section, a parallel set of equations was estimated using the narrow money supply instead of total reserves as the monetary policy variable. The same procedure was used in testing alternative lag structures to determine which combination of lags maximizes the R^2. The results of this experimentation indicated that the best "fit" was obtained using a distributed lag of four quarters on the money supply, three quarters on Government expenditures, and eight quarters on the tax variable. (All lag periods include the current quarter.) This equation and its coefficients (with "t" values) are given in Table IV. Summary statistics for alternative lag structures are also reported in this table.

An examination of the coefficients in equation (7) indicates that these results support the conclusions cited in the previous section in every regard.[32] The $\triangle G$ and $\triangle T$ multipliers from equation (7) are actually somewhat higher than those from equation (3), and the "t" statistics for the tax variable ($\triangle T$) in equation (7) are consistently larger than those in equation (3). One interesting aspect of these equations is the timing of the impact of tax changes suggested by the coefficients of $\triangle T$—particularly in light of the recent experience with the surtax. The tax coefficients indicate that, "on average", about two thirds of the total impact of tax changes is felt in the period from the fourth through the seventh quarters after the change. Thus, these coefficients suggest that the cumulative impact of the surtax would not have been very large before 1969-III and that the impact in 1968-III and 1968-IV would have been virtually nil. This is not to suggest, of course, that equations of this type could anticipate, and allow for, any role that price expectations may have played in dampening the impact of the surtax.

In short, the results of this section, like those in the preceding section, suggest that Andersen-Jordan appear to have overstated the case against fiscal policy, particularly with regard to the impact of tax changes on GNP. At the same time, however, the results obtained using the money supply as the exogenous monetary variable exhibit the same anomalies noted earlier in conjunction with the results using total reserves: the relative sizes of the expenditures and tax multipliers do not conform to expectations

[29] When this equation is fitted to data through 1969-IV, the general pattern suggested in equation (1) is unchanged although the R^2 declines slightly and the sum of the coefficients for $\triangle T$ is reduced to 1.7. The latter is primarily a reflection of the 1968 surtax experience. This shift in multiplier size and the similar changes in multipliers referred to in the text are quite disturbing, since they suggest that these relationships are not very stable. This point will be pursued later in the text.

[30] In fact, when this equation is fitted to data through 1969-IV using a six-quarter lag on $\triangle G$, the R^2 is slightly higher than is the case with a three-quarter lag on $\triangle G$.

[31] An "F" test designed to indicate the significance of the improvement in the R^2 relative to the loss of degrees of freedom was conducted for these coefficients. The calculated value of "F" was 2.49 which was greater than the critical value of "F" (2.26 at the 1 percent level for 6 and 58 degrees of freedom).

[32] In this equation, the improvement in the R^2 attributable to the fiscal variables was .1184 (from .5180 to .6364). The calculated value of "F" in this instance was 3.14, well above the 1 percent tabular value of 2.26.

and small changes in the lag structures accompanied by small changes in the R^2 are, in some instances, associated with substantial changes in the multipliers, e.g., equations (7) and (9).

It is interesting to note that, when the equation is fitted using the FES data in place of the IS fiscal variables, this problem becomes even more serious. For example, tests of selective lag structure in an equation which regresses $\triangle$GNP on $\triangle M_1$, change in full employment expenditures ($\triangle$FEE) and change in full employment receipts ($\triangle$FER) indicate that the R^2 is maximized when lags of four, five, and eight quarters, respectively, are used on these variables. Rounded to two decimal places, the coefficient of determination in this equation is the same as that reported in equation (7). However, in the equation using the FES data, there is virtually no net fiscal influence, and the lagged coefficients of the expenditures variable show the negative signs which have been consistently reported in the St. Louis results.[33] Given these differences in results, and the extremely small differences in R^2's, it would appear that alternate forms of these equations provide the user the opportunity of selecting the equation which fits his own theoretical point of view. Clearly, this is not the most ideal of circumstances.

Table IV

CHANGES IN GNP REGRESSED ON CURRENT AND LAGGED CHANGES IN M_1, G, AND T

1952-I to 1968-IV

(7) R^2 = .6364
SE = $4.1 billion
DW = 1.5

Lag period	Distributed lag weights		
	ΔM_1	ΔG	ΔT
t	1.1* (2.2)	0.3 (1.2)	0.0 (0.2)
t-1	1.2* (6.0)	0.4* (2.7)	0.3 (1.9)
t-2	1.1* (3.7)	0.4 (1.8)	0.4* (3.6)
t-3	0.7* (2.6)		0.5* (4.0)
t-4			0.6* (4.0)
t-5			0.5* (3.8)
t-6			0.4* (3.7)
t-7			0.2* (3.6)
Σ	4.1	1.1	3.1

Alternative specifications	Summary statistics for alternative lag structures							
	Lag† on			R^2	SE	Multipliers		
	ΔM_1	ΔG	ΔT			ΔM_1	ΔG	ΔT
(8)	8	8	8	.6124	4.3	3.7	0.9	2.9
(9)	4	5	8	.6360	4.1	4.9	0.5	1.8
(10)	5	3	8	.6297	4.2	4.3	1.0	3.0
(11)	4	4	4	.5808	4.4	5.2	0.5	0.8

R^2 = Coefficient of determination.
SE = Standard error of the estimate.
DW = Durbin-Watson statistic.
ΔM_1 = Change in the quarterly average level of the narrow money supply.
ΔG = Change in the Government spending component of the initial stimulus (IS).
ΔT = Change in the tax component of the IS.
Σ = Summation of regression coefficients. Because of rounding, components do not necessarily add to totals.
* Coefficients significant at 5 percent level.
† Lag lengths include current quarter values of respective variables.

ALTERNATE SPECIFICATIONS OF THE MONETARY-FISCAL EQUATIONS. To shed additional light on some of the more disturbing aspects of these reduced-form equations, several alternates were experimented with. In the first of these modifications, the performance of other monetary aggregates was tested. That is, NBR and total bank credit were substituted for M_1 in equation (7). As expected, the use of NBR yielded the strongest performance of the fiscal variables, but also resulted in the lowest R^2's for the overall equation. For bank credit, the R^2's were generally comparable, and in some cases slightly higher than those attained with M_1. The tax variable continued to show significant effects, in the expected direction, of changes in taxes on changes in GNP. However, in the equation using bank credit as the monetary variable, the performance of the Government spending variable ($\triangle$G) was weaker than when M_1 was used as the monetary indicator. In fact, the performance of $\triangle$G was not impressive in any of these equations either in terms of the magnitude of its coefficients or in terms of its "t" statistics. Tests were then undertaken to provide some additional insight into the behavior of the Government spend-

[33] Andersen and Jordan explain the negative signs on full employment expenditures by asserting that rises in Federal spending may "crowd out" private spending, thereby inducing a fall in GNP. Presumably this crowding out would result from higher Government spending leading to higher interest rates which, in turn, would lead to a reduction in private spending. Thus, within this framework, Federal spending is a major determinant of interest rates.

ing variable.[34]

In one such modification, the series on total Government expenditures was disaggregated into its "goods and services" and "transfer" components[35] and each was entered into the regression equation as a separate independent variable. Coefficients are shown in Table V for equation (12), relating GNP to the narrow money supply (M_1), Federal expenditures for goods and services (G_{g+s}), Federal transfer payments (G_{tr}), and autonomous tax changes (T).

Comparison of equation (12) with equation (7) indicates that disaggregation of Federal outlays (G) into its goods and services and transfer components adds to the explanatory power of expenditures. In addition, the multiplier of the transfer variable is 1.9 and its coefficients at t-1 and t-2 are easily significant at the 5 percent level. Nevertheless, the goods and services variable taken by itself is weak. In part, the poor performance of the goods and services variables and/or the total outlay series ($\triangle G$) may reflect serious distortions in the series resulting from the defense timing adjustments. However, alternate specifications of the same general equation form, particularly those using NBR as the monetary variable, tend to produce substantially better results for the expenditures variable. This suggests that the shortcomings of the expenditures series itself are not the only, nor even the major, factor influencing the behavior of $\triangle G$ in the reduced-form equation.

A more plausible and perhaps more important factor in this regard relates to the manner in which Government outlays are financed. That is, the effects of changes in Federal spending may differ depending on whether they are financed by higher taxes or by debt operations which often involve monetary expansion. To the extent that this is a valid argument, an examination of the simple correlation coefficients between the variables on the right side of these equations should provide some insight into the quantitative significance of the monetary effects of changes in Government spending. For example, it might be expected that the strong performance of the transfer variable in equation (12) is a reflection of the fact that these outlays, particularly for social security, are typically financed by higher taxes and are not likely to induce debt operations and monetary expansion. On the other hand, goods and services outlays, notably for defense, are more likely to produce these effects. However, the simple correlation coefficients between M_1 and G_{g+s} and between M_1 and G_{tr} do not provide impressive support for this view. For example, the coefficient of correlation between $\triangle M_{1t}$ and $\triangle G_{g+st}$ is .27, while the coefficient between $\triangle M_{1t}$ and $\triangle G_{trt}$ is .23. Certainly the behavior of G_{tr} relative to that of G_{g+s} cannot be explained on the basis of this difference in correlation coefficients. In the final analysis the relative behavior of G_{g+s} may be a reflection of nothing more than its relatively small variance. Nevertheless, it is interesting to note that, in testing the monetary-fiscal influence using various monetary aggregates, the Government spending

Table V

CHANGES IN GNP REGRESSED ON CURRENT AND LAGGED CHANGES IN M_1, G_{g+s}, G_{tr}, AND T

1952-I to 1968-IV

(12) R^2 = .6679
SE = $4.0 billion
DW = 1.7

Lag period	Distributed lag weights			
	ΔM_1	ΔG_{g+s}	ΔG_{tr}	ΔT
t	0.9* (1.8)	0.6 (1.6)	−0.3 (0.5)	0.1 (0.6)
t-1	1.3* (6.3)	0.1 (0.6)	1.0* (2.8)	0.3 (1.9)
t-2	1.3* (4.2)	0.0 (0.2)	1.1* (2.9)	0.4* (2.9)
t-3	0.9* (3.2)			0.4* (3.0)
t-4				0.4* (2.8)
t-5				0.4* (2.6)
t-6				0.3* (2.5)
t-7				0.2* (2.4)
Σ	4.4	0.7	1.9	2.5

R^2 = Coefficient of determination.
SE = Standard error of the estimate.
DW = Durbin-Watson statistic.
ΔM_1 = Change in the quarterly average level of the narrow money supply.
ΔG_{g+s} = Change in Federal expenditures for goods and services.
ΔG_{tr} = Change in Federal transfer payments.
ΔT = Change in the tax component of the initial stimulus (IS).
Σ = Summation of regression coefficients. Because of rounding, components do not necessarily add to totals.
* Coefficients significant at 5 percent level.

[34] One such test utilized leads of one to four quarters on the expenditures variable. This alternate was designed to test the possible significance of the timing adjustment made in the NIA defense expenditures data. This adjustment is necessary because defense purchases in the NIA budget are recorded at the time of delivery. Thus, in the case of long-lead durable defense goods, much of the income effect precedes the delivery date and the corresponding entry in the NIA. In general, the performance of the $\triangle G$ variable was not significantly improved by this modification.

[35] In this context, transfers are broadly defined to include all nongoods and services expenditures.

variable tended to perform better in the instances where the intercorrelation between the money and the $\triangle G$ variable was minimized. For example, in the case of NBR, where the performance of $\triangle G$ is the strongest, the simple correlation between $\triangle NBR_t$ and $\triangle G_t$ is .14,[36] and in the case of bank credit, where the performance of $\triangle G$ is very weak, the simple "r" between $\triangle BC_t$ and $\triangle G_t$ is .43. These results suggest that the behavioral relationship between Federal sector spending and financing activities and the monetary aggregates warrants more careful scrutiny in order to broaden our understanding of the relationships implied by these reduced-form equations.

SUMMARY

The primary concern of this paper is the hypothesis that the IS is a more useful indicator of short-run changes in discretionary fiscal policy than the FES. This superiority is largely a reflection of the fact that the FES has a large and unsystematic bias toward restraint resulting from the estimation procedures used to calculate full employment budget receipts. The empirical results presented in this paper tend to give convincing evidence of this superiority of the IS. Moreover, within the broader perspective of monetary and fiscal impacts on the economy, the results presented in this paper suggest that fiscal policy, particularly tax rate changes, does indeed play a significant role in determining changes in GNP. Beyond this, however, the results of this examination are, in many ways, more negative than positive. For example, the large changes in the net monetary and/or fiscal influence which accompany very small changes in time periods or lag structures are most disturbing, since a small change in the lag structure may result in substantially different estimates of the impact of a given policy change on the economy. Similarly, alternate specifications of the same equations yield similar results in terms of R^2 and standard errors, but quite dissimilar results in terms of the impacts of monetary and fiscal policy. These differences cannot be dismissed lightly. Rather, the linkages between changes in monetary and fiscal policy must be more carefully examined in order to provide some meaningful insight into these inconsistencies.

[36] The low correlation between $\triangle NBR_t$ and $\triangle G_t$ is somewhat surprising since System even-keel operations which concur with Treasury borrowing operations are conducted through open market operations which, of course, directly influence the volume of NBR. Thus, it might be expected that the correlation between these two variables would be higher than would be the case with the other aggregates.