Will Big Deficits Spoil the Recovery?

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Since 1979 the federal government's unified budget deficit has been growing. This year the deficit should rise to 6 percent of gross national product, an historic high for peacetime, and, as shown in Table 1, common projections foretell of deficits remaining near 5 percent of GNP at least until 1986. Previously, peacetime deficits seldom rose as high as 3 or 4 percent of GNP. Consequently, the administration and the Congress are devising plans to reduce the deficit to approximately 2 or 3 percent of GNP by the late 1980s.

Depending on business conditions and the course of monetary policy, there are periods when the fiscal policy runs deficits as it restores and sustains high employment production. We appear to be in the middle of such a period. According to the consensus forecast, the current mixture of monetary and fiscal policy seems to be encouraging a steady recovery that will not overshoot high employment GNP. Unless there is a change in the mix of fiscal and monetary policies, attempts to reduce the deficit through tax hikes or spending cuts alone may reduce the growth of GNP and investment spending.

The recovery may be acceptable, but it is certainly not the best we could hope for. Although the federal government's budget may not be balanced in the near future, the huge prospective deficits may signify the wrong mixture of monetary and fiscal policies. For example, many advocate swapping fiscal stringency (spending cuts or tax hikes) for some monetary leniency (lower interest rates) so that the prospective path of recovery remains unchanged while home building, business fixed investment, or net exports increase and the debt servicing costs of developing countries can be reduced. But there are limits to which fiscal policy can be relied upon to reach a preestablished deficit target while using monetary policy to sustain GNP growth. Preset deficit targets may lead to policies that cannot be sustained for long if the necessary monetary leniency implies that real rates of interest, after taxes, must drop to or below zero, or if short-term interest rates must remain too far below long-term yields. This paper uses three large econometric models to assess how different blends of fiscal and monetary policies alter the composition of GNP.

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Table 1
The Federal Government Deficit as a Percent of GNP

	Baseline Congressional Estimates[1]		Congressional Estimates[1]		Administration Estimates[6]	
	Reported Deficit[2]	Standardized Deficit[3]	Reported Deficit[4]	Standardized Deficit[5]	Reported Deficit[7]	High-Employment Deficit[8]
1982	3.6	0.6	3.6	0.6	3.8	0.3
1983	6.4	2.3	6.4	2.3	5.6	1.2
1984	5.5	2.3	5.1	1.9	4.6	0.7
1985	5.2	2.6	4.5	1.9		
1986	5.1	2.8	3.4	1.1		

[1]Congressional Budget Office, Congress of the United States, *Economic and Budget Outlook: An Update, August 1983.*
[2]Figures from Table A-3, page 112; baseline unified deficit divided by projected GNP.
[3]The baseline unified budget deficit standardized at 6 percent unemployment, divided by standardized GNP. Figures from Table 5, page 13; plus the difference between the baseline deficits in Table A-3, page 112, and Table 11, page 59, divided by standardized GNP; and less the following adjustment for net interest expense. (Net stock of federal debt/standardized GNP − .31) ⋆projected interest rate on federal debt ⋆.65: the recent growth of the stock of debt, due to underemployment, is not allowed to increase standardized net interest expense. The factor .65 accounts for the loss of tax revenue due to the lower net interest expense.
[4]Figures from Table 11, page 59; baseline unified budget deficit divided by projected GNP.
[5]The baseline unified budget deficit standardized at 6 percent unemployment (including the net interest adjustment described in note 3), divided by standardized GNP. Figures from Table 5, page 13.
[6]Bureau of Economic Analysis, Department of Commerce, estimates using projections from the Office of Management and Budget's "Mid-session Review of the 1984 Budget," July 25, 1983.
[7]National Income and Product Accounts measure of the current services budget deficit.
[8]Estimates of the deficit at high-employment levels of production (including the net interest adjustment described in note 3) — at an unemployment rate of 5.1 percent in fiscal year 1984 — divided by high employment GNP. See deLeeuw et al., (1980).

I. Fiscal Policy, Deficits, and Economic Activity

Contemporary macroeconomic analysis may be divided into two broad schools of thought: the classical tradition and the Keynesian tradition. Economists belonging to the classical tradition generally believe that agents seeking their self-interests in auction markets achieve an efficiency in the production and distribution of goods and services. Consequently, government's role in society should be limited, and there is little justification for countercyclical fiscal policy to assure the high employment of resources. According to classical thought, whatever the size of the budget deficit, it is government spending that crowds out private spending. Higher taxes cannot diminish the government's claim on GNP.

Keynesians, on the other hand, believe that markets are incapable of reconciling the inevitable differences among the expectations of households and businesses in a manner guaranteeing full employment. As a result, Keynesians generally advocate an active role for fiscal and monetary policies. Depending on business conditions, the policy that sustains high employment may entail budget deficits at some times, while at other times the appropriate policy may entail budget surpluses at high employment. By failing to sustain high employment, the government policy may reduce the rate of capital formation and the growth of living standards.

The Classical Tradition

Today monetarists, proponents of rational expectations, neoRicardians, and ultrarationalists, among others, represent the classical tradition. The monetarists believe that in auction markets taste and technology are the irrepressible forces behind spending, saving, and investment decisions (M. Friedman 1956, 1968, 1971; Patinkin 1965). Changes in fiscal policy and monetary policy might temporarily disturb market equilibria, but, in the long run, society arrives at new equilibria (conditioned by fiscal policy) in which monetary policy simply dictates the rate of inflation. Monetarists generally believe that an active fiscal policy (except for a rock bottom role such as the provision of a national defense) can only diminish social welfare by interfering with and redirecting market forces. The economy is inherently stable.[1]

The rational expectations approach (Sargent and Wallace 1975, Lucas and Sargent 1978, and Sargent 1979) introduces an equilibrium theory of the business cycle, reconciling much of the classical tradition with the occurrence of "underemployment." Business cycles arise as households and businesses react to unanticipated events. For countercyclical fiscal policy to mitigate

[1]It is ironic that many monetarists have built their macroeconomics on classical microeconomics. Hahn (1965) noted that money has no positive exchange value in Patinkin's model so this model and others like it cannot serve as an adequate foundation for a monetary theory. Perhaps this flaw can be patched up by putting money and other financial assets in the utility function. The utility of these assets is not direct, it depends on their ability to facilitate transactions, to yield warmth, diminish hunger, etc. in the future so this utility itself must depend on interest rates and prices. Putting these assets in the utility function is therefore one way of treating expected future utility. In any case, the unique link between money and the price level vanishes once a spectrum of financial instruments is introduced.

these cycles, it must successfully foresee and offset these unanticipated events.[2] Here, as in monetarism, fiscal policy is not ineffectual—changes in tax rates, for example, can eventually alter the equilibrium capital-labor ratio—but rational expectations, like monetarism, discourages the active fine tuning of tax laws and spending programs to stabilize economic growth. Here, as in monetarism, markets "clear," but rational expectations distinguishes itself by assuming that households and businesses have sufficient (but not necessarily perfect) knowlege of one another's rules for making economic decisions. Errant forecasts give rise to frustrations, but errors tend to be minor and *not systematic*.[3]

Both the neoRicardian and ultrarationalist theories essentially assume that Debreu's (1972) version of classical equilibrium prevails. The neoRicardian theory (Barro 1974, 1979, 1981) contends that households and businesses regard government spending as a substitute for private spending and that they regard deficit financing as a promise of future taxation. A temporary increase in government spending may increase national income temporarily as factors of production exchange more work today for less work tomorrow, but a permanent increase in government spending depresses the permanent income of households and businesses so private spending declines as much as public spending rises. Government spending must be financed either by taxes or by issuing bonds. Either way, a permanent $1 rise in government spending entails the same increase in the present value of tax liabilities because bond issues merely delay the collection of taxes.

Ultrarationalism (David and Scadding 1974) takes neoRicardian theory one step further. Government spending may be divided into public consumption and public investment spending. Public consumption spending displaces private consumption dollar for dollar, and public investment displaces private investment dollar for dollar. According to some ultrarationalists, deficits can displace private investment spending dollar for dollar if government investments are perfect substitutes for private investments and government finances all of its investment spending and only its investment spending

[2]Lucas and Sargent (1978) also contend that these policy changes themselves must not be anticipated by households and businesses. This seems to be redundant. If the fiscal authority can predict shocks (events not systematically related to previous events) and adjusts policy accordingly, how can I predict fiscal policy successfully without knowledge of these shocks?

[3]Ironically, rational expectations begs a theory of knowledge that cannot be justified rationally (Hume 1966, 1978, Ayer 1972, Quine 1970, Keynes 1965, Robinson 1965, B. Friedman 1978, 1979, Berkman 1980, Arrow 1978, 1982): rational expectations requires households and businesses to understand more of society's causal relationships than is logically possible from mere deduction and observations. Proponents of rational expectations believe that households and businesses can discover how the economy works through observation and deduction. So it is no accident that many of rational expectations' supporters are also proponents of testing for "causality." Rationality is objectivity.

Because deduction and observation alone cannot identify natural laws, rational expectations itself must rest on some nonrational means of "knowing." This theory illustrates the powerful economy embedded in the postulate of the auctioneer who at once provides information and arbitrates among diverse self-seeking agents. Without the auctioneer, households and businesses must make systematic errors unless their maintained hypotheses match nature's mechanics.

by issuing bonds. In both the neoRicardian and ultrarational models countercyclical fiscal policy has little effect and consequently little justification.[4]

In summary, the classical tradition has its share of distinct schools of thought, but they all discourage the active use of fiscal policy for fine tuning the course of GNP. Some conservatives who follow the tradition recommend budget balance over sizable deficits to limit the role of government (by constraining government spending) and to limit the rate of inflation (by not tempting the central bank to "monetize" the debt). Buiter (1983) contends that whatever the merits of this political science, such conclusions are not necessarily supported by classical economic analysis. Nor do these fears appear to be justified by the experience shown in Charts 1, 2, 4, and 5.

The classical tradition says little of government deficits directly. Instead it compels those who would change taxes or spending to examine the potential influence of these proposals on the course of economic development. Government policy might foster investment spending by encouraging businesses to employ more capital with each laborer, but the supply and demand schedules for labor and capital, not the size of the deficit, dictate the proper strategy (Hall and Jorgenson 1967, M. Friedman 1968, 1971, Nelson 1976, Johnson 1981, Moore 1981, Kopcke 1980, 1982).

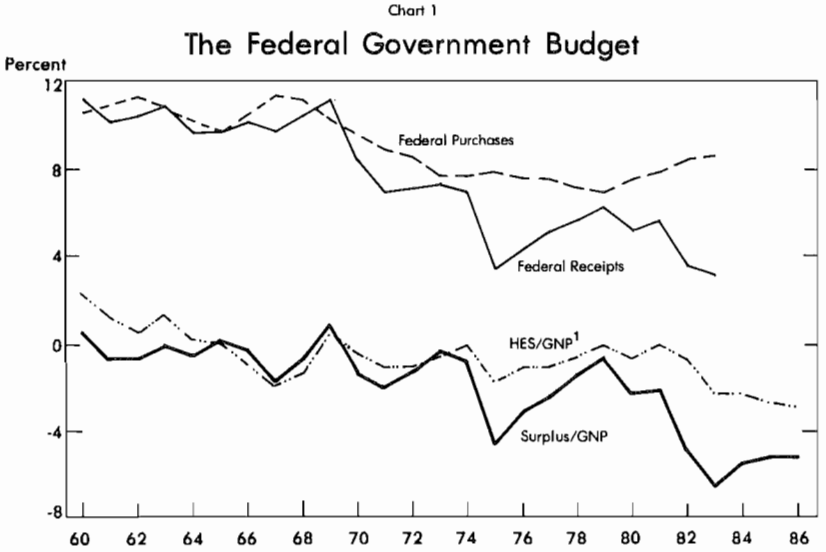
Given the classical assumptions of high employment, it is government spending itself that crowds out spending by households and businesses. Higher taxes cannot ease the government's claim on GNP. Some recommend personal tax hikes to shift some of the burden of greater government spending from investment to consumption, but such a policy cannot avoid the diversion of resources from consumption (and from investment by industries producing consumer goods and services) to favor spending by industries producing goods and services for the government.

The Keynesian Tradition

Keynes had little intention of overturning classical analysis; a few patches—albeit important patches—could salvage the classical tradition. Markets are incapable of reconciling the inevitable differences among the expectations of households and businesses in a manner guaranteeing full employment, but the government could allow classical theory to come into its own by assuring this high employment. Keynes contended that fiscal policy can do much to restore high employment during recessions, and the majority of contemporary Keynesian models supports this conclusion.

[4]Both of these theories have their critics some of whom belong to the classical tradition themselves. Fiscal policy can influence the use of national resources (Teigen 1980, Ripley 1980) and the distribution of national income (Danziger et al. 1980, Oates 1980). Barro discusses only lump sum taxes, but if taxes and liabilities are tied to income, sales, or consumption, tax policy (or the growth of government debt) can influence the behavior of households and businesses (Buiter 1979, Buiter and Tobin 1979, Tobin and Buiter 1980, Rosen 1980, Hall and Jorgenson 1967, Nelson 1976, Kopcke 1980, Buchanan 1976, Tobin 1965, Burmeister and Phelps 1971, Christ 1980). If capital markets are not perfect, these strong neoRicardian and ultrarationalist conclusions collapse (Feldstein 1982, Tobin and Dolde 1971, Arak 1982).

Chart 1



[1] Projections taken from Table 1. Historical data from B.E.A.

Chart 2

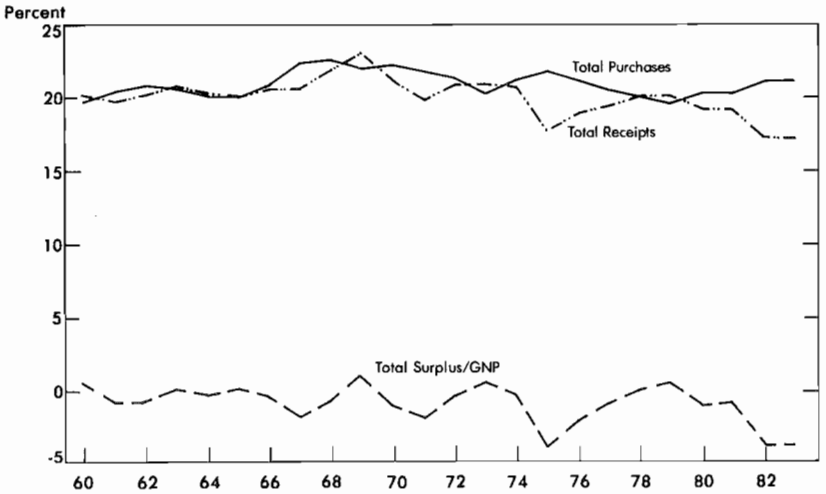
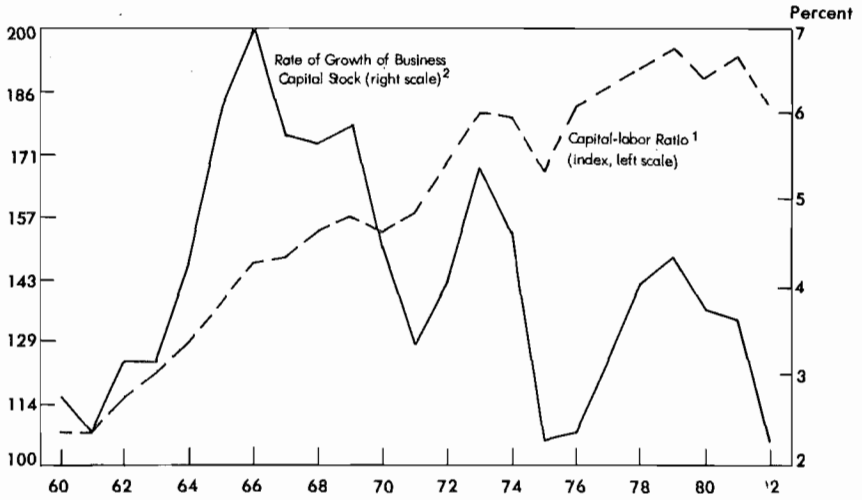


Chart 3

The Growth of the Capital Stock

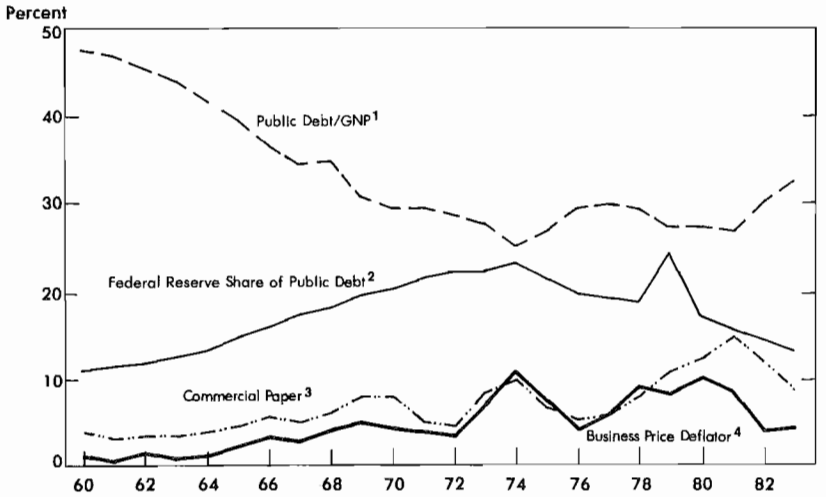


[1] Ratio of net stock of real nonresidential nonfinancial corporate capital to hours worked by all nonfinancial corporate workers, multiplied by the capacity utilization rate

[2] Rate of growth in the net stock of real nonresidential nonfinancial corporate capital

Chart 4

The "Monetization" of Federal Debt



[1] Federal debt held by the public, including the Federal Reserve

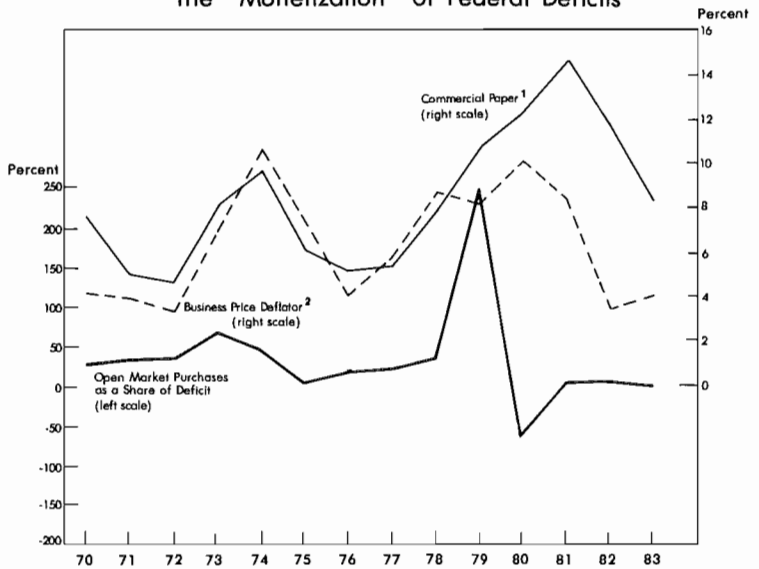
[2] The Federal Reserve's portion of the federal debt held by the public

[3] 6-month prime commercial paper rate

[4] 4th quarter to 4th quarter percentage change

Chart 5

The "Monetization" of Federal Deficits



[1] 6-month prime commercial paper rate

[2] 4th quarter to 4th quarter percentage change

Keynesian theories and models distinguish themselves by allowing that aggregate demand—the sum of desired consumption, investment, and government spending—need not equal the supply of goods and services at full employment. In other words, households' desired saving does not match businesses' desired borrowing at full employment. If households wished to save more than businesses planned to borrow, aggregate demand would fall short of supply, and businesses would accumulate unwanted inventories of unsold goods, prompting lower production plans, creating unemployment, thereby eventually reducing capital formation.[5] In this case, Keynesians contend that fiscal policy (and monetary policy) can increase aggregate demand to match supply at full employment. At high employment, then, a successful policy guarantees that the government's deficit equates the total supply of savings with the total demand for that savings. Depending on business conditions, the state of expectations, and the government's strategy, the budget at times may be in deficit for policy to maintain high employment and the growth of living standards while at other times the budget may show a surplus at high employment. At times, then, deficits at full employment are welcome. At other times, a policy that entails a deficit can be harmful, causing aggregate demand to exceed supply, perhaps crowding out investment spending as a result. There is no guarantee that nature will permit government

[5]Keynes did not believe the interest rate could equate the supply of savings with the demand for savings without income changing at the same time.

surpluses and deficits to average out over any specific interval of time, nor is there any guarantee that past surpluses and deficits should guide or set a standard for future fiscal policy. The deficit is a by-product of government policy interacting with economic circumstances.

The Hicks-Hansen IS-LM model is the most familiar Keynesian model (Blinder and Solow 1973, 1974). Consider the following streamlined version:

$$(1) \quad Y = C + I + G$$

$$(2) \quad C = c_0 + c_1 (Y + rB - T) + c_2 (M + B)$$

$$(3) \quad I = i_0 + i_1 Y - i_2 r$$

$$(4) \quad G = g_0$$

$$(5) \quad T = t_0 + t_1 Y + t_1(rB)$$

$$(6) \quad r = r_0 + r_1 Y/(M+B) - r_2 M/(M+B),$$

where Y is national income, C is consumption, I is investment, G is government spending, T is taxes (less transfers), r is the interest rate, M is the money stock, B is the stock of bonds (and equity), and (6) is the familiar money demand equation set equal to an exogenous money stock, then converted to an interest rate equation. This model can be solved for its equilibrium value of income:

$$(7) \quad Y = (g_0 - c_1 t_0)\, m + (a)\, m$$

where $a = (c_0 + c_1 B(r_0 - r_2 M/M + B))\,(1 - t_1) + c_2(M+B) + i_0$

$$- i_2(r_0 - r_2 M/(M+B)))$$

$$m = (1 - c_1(1 - t_1(1 + r_1 B/(M+B)) + r_1 B/(M+B) -$$

$$i_1 + i_2 r_1/(M+B)))^{-1}$$

Income is not a function of the deficit ($T - G = t_0 + t_1 Y + t_1 rB - g_0 - rB$) so neither interest rates (6) nor investment (3) are proper functions of the deficit.

In this model, a \$10 billion spending hike (g_0) raises equilibrium income (Y) more than a \$10 billion tax cut (t_0) raises income, even though either action would lower the high employment surplus (HES) by \$10 billion. The change in income is 10 to 40 percent greater for the spending hike than for the tax cut.[6] Therefore, the correlation between changes in the HES and changes in equilibrium income will be low if the alterations in fiscal policy at times

[6]Without the wealth effect ($c_2 = 0$) the value of c_1 appears to be about .9; with the wealth effect, a popular feature of many modern consumption functions, the value of c_1 appears to be about .65 (Modigliani 1971, p. 75). The value of c_1 may drop even further if human wealth is included.

arise from new spending policies but at other times arise from new tax policies. In fact, the well-known "balanced-budget multiplier theorems" show that matched changes in government spending and taxation alter income even though the HES does not change and that a fiscal policy relying on modest spending cuts and somewhat larger tax cuts might increase equilibrium income only a little (or even reduce income) while reducing the HES substantially.

The government can reduce a deficit by reducing its spending (g_0) or increasing lump sum taxes (t_0). According to (7), either step also would reduce income, interest rates, and investment.[7] To increase income and investment during a recession, government spending must increase, taxes must be reduced, or both. A kind of crowding out occurs in this last case, however. The rise in equilibrium income increases the transactions demand for money, thereby increasing interest rates unless the money stock changes. Despite these higher yields, investment spending increases. The magnitude of the crowding out that occurs depends on the size of the money stock, not the size of the deficit.

The conclusion that crowding out occurs whenever income rises has several qualifications. Keynesians agree with classical economists that, as GNP approaches the economy's productive capacity, an increase in government spending is more likely to displace consumption and investment spending. Furthermore, if this hypothetical economy trades with other nations, all linked to one another by perfect capital markets, then fiscal policy's influence on income and investment will tend to be small—net exports will be displaced by fiscal expansion (Mundell 1962; Fleming 1962; Dornbusch 1978, 1980, pp. 193–214; Fieleke 1982).

Macroeconomic theorists have done much to embellish this streamlined model over the years. Two-assset models, like the one above, featuring bonds (capital) and money assume from the start that government debt is a perfect substitute for private equity and debt. Instead, the model might feature a richer spectrum of assets allowing for degrees of complementarity among capital, bonds, and money (Tobin 1965, 1969, 1982; Cohen and McMenamin 1978; B. Friedman 1978, 1980, 1983; Roley 1981, 1983, Frankel 1983). As it stands the model also lacks a government budget constraint (Christ 1968, 1978, 1979; Silber 1970; Meyer 1975). As the government runs deficits, the stock of government bonds will grow and, other things equal, the ratio of government bonds to money in the public's portfolio will increase, mandating higher equilibrium rates of interest. The IS-LM model does not represent this dynamic interaction between the flow of goods and services and asset stocks because it was supposed to apply to an interval of time so short that asset stocks change only negligibly. Many now believe that the design of a successful fiscal policy requires planning ahead, so the government budget constraint is a more popular feature of macromodels. If the stock of government bonds can change with time so can the stock of other assets, like

[7] I am assuming that $(i_1 - i_2 r_1/(M+B))$ is positive as seems almost a certainty. Otherwise, any nonmonetary shock that increases income must crowd out investment, even though the shock increases income by a multiple of itself.

capital. We eventually end up adopting models in which prices and wages may change along with asset values. Unfortunately, this step is not costless because the analysis of fiscal policy now depends on the course of monetary policy. In a sense fiscal and monetary policy no longer appear to be so distinct, suggesting that we should be examining a unified government policy rather than fiscal policy alone.[8]

This more dynamic macromodel enlivens the crowding out controversy. The static macromodel demonstrated that tax cuts may increase GNP when the economy is not at high employment, thereby increasing savings and investment along with the deficit. To this analysis of income flows, the dynamic model contributes an analysis of asset stocks. Tax cuts that foster the growth of GNP also increase the market value of factories, equipment, houses, human capital, and other assets comprising the private capital stock. In other words, a lenient fiscal policy may promise greater deficits, but it also increases the market value of assets by promising higher utilization rates and greater earnings (Tobin 1969, 1982). The flow of new government debt securities therefore need not elbow its way into private asset portfolios, displacing business securities, because the relatively sharp increase in the value of private assets can create space for government debt if it is not a perfect substitute for private securities.[9]

Just as debt complements equities in some portfolios (pension and life insurance funds, for example), liabilities of the Federal Reserve complement debt in other portfolios (depository institutions and some mutual funds, for example). A stock market rally, prompted by forecasts of greater earnings, may tend to depress debt yields relative to equity yields,[10] but debt yields will rise relatively quickly if the stock of debt grows much faster than the supply of Federal Reserve liabilities. These higher debt yields, in turn, will raise equity yields, or discourage further debt issues, or both. Therefore some of fiscal policy's secondary clout—the increase in the present value of earnings on capital, the increase in real wealth, and the crowding in of debt—depends on the course of monetary policy even in this more dynamic model.

[8]This conclusion is not peculiar to Keynesian models; it also crops up in some classical models (Miller 1982).

[9]To the extent the government issues short-term debt, private bond issues may be crowded in all the more. If bonds and equity were close substitutes, then the increase in stock prices would discourage long-term debt issues in favor of short-term debt issues. However, institutional rules of thumb concerning the mix of bonds and stocks in professionally managed portfolios (the 60/40 split) and empirical estimates, imply that bonds and equity are not very close substitutes. (See also Roley 1983, B. Friedman 1978, 1980, 1983, and Frankel 1983.)

[10]Suppose a 50 percent increase in prospective earnings, other things equal, raises the prospective return on equity by 50 percent as well. If equity prices rise 50 percent, suppose this prospective return on equity is pushed back to its former value. But, because stocks and bonds are not perfect substitutes, portfolio managers will not be willing to watch their equity positions grow 50 percent while their bond positions rise less quickly unless the return on equity rises relative to the return on bonds. As a result, equity prices may not rise the full 50 percent, bond prices may rise, or both.

Unlike the classical tradition, Keynesians generally advocate the active use of fiscal policy to stabilize GNP near high employment.[11] Yet, like the classical models, Keynesian models do not suggest that the deficit is an appropriate measure of fiscal policy. Fiscal policy can change aggregate demand to match supply at full employment. Depending on business conditions, the appropriate fiscal policy at times may entail budget deficits to reach or sustain high employment GNP, while at other times the appropriate policy may bring budget surpluses. Current deficits do not necessarily crowd out investment spending as long as fiscal policy does not push aggregate demand above supply or harm the prospects for future growth. An exclusive reliance on fiscal policy to achieve and sustain high employment GNP is somewhat artificial, however. In Keynesian macromodels, fiscal and monetary policies are not so distinct. The growth of investment spending and GNP depends on the mix of tax rules, spending programs, and monetary policy adopted by policy makers. In principal, the government can foster the maximal growth of living standards by choosing a policy mix that sustains both high employment GNP and an appropriate volume of investment spending.

II. The Econometric Models' Tales: Some Consequences of Changing the Policy Mix

According to the Keynesian tradition, fiscal policy or monetary policy can foster economic growth when resources are underemployed for prolonged periods. As discussed above, the exclusive use of fiscal policy may stimulate GNP growth while restraining investment more than desired for want of monetary accommodation. Conversely, the exclusive use of monetary policy may foster too much investment spending. These observations suggest that an appropriate blend of monetary and fiscal policies can achieve at once the desired growth of GNP and the desired mix of consumption, home building, business fixed investment, and net exports.

Tables 4 to 7 describe some of the consequences of combining personal income tax hikes with more lenient monetary policy. Table 4 shows the baseline projections for three large econometric models from 1984 to 1988.[12] For the projections shown in Table 5, personal income tax liabilities are increased

[11]Given the undeniable role of uncertainty in Keynesian models, critics contend that optimal control counsels caution. Some go one step further, advocating neutrality (Brunner 1980). But what is neutrality: A constant rate of growth of government bonds? A constant ratio of government spending to (potential?) GNP? Constant tax rates by income class? Does neutrality even require that something be constant? If so, perhaps the growth of GNP should be constant? Perhaps transfer payments should vary with the business cycle? Unfortunately, defining neutrality (especially outside the steady state) presumes a knowledge sufficient to justify some degree of action. Or, put another way, ignorance denies us the option of a neutral policy: one theorist's definition of neutrality is another's definition of activism.

[12]I do not wish to encourage critical model comparisons or to encourage anyone to attribute the results of these experiments to the forecasters who maintain these models so I have chosen not to disclose the identities of the models. Tables 4 to 7 are intended only to illustrate our "best guesses" about the effect of policy changes in the composition of GNP.

I did not adjust the baseline model forecasts to match one another because the subsequent experiments then might reflect the effects of my tinkering as well as the effects of the alternative policy mixtures.

Table 2
Gross Saving and Investment as a Percent of GNP[1]
(in percent)

		Government Balance			Business Balance				
	Personal Saving	Total	Federal	State and Local	Total	Retained Earnings[2]	Capital Consumption[3]	Gross Investment[4]	Foreign Balance[5]
1946	6.6	2.5	1.5	0.9	−7.0	0.9	6.7	−14.6	−2.3
1947	2.2	6.2	5.8	0.5	−5.1	2.0	7.4	−14.5	−4.0
1948	4.3	3.3	3.2	0.1	−6.1	3.8	7.7	−17.6	−0.9
1949	2.9	−1.3	−1.0	−0.3	−1.4	3.8	8.4	−13.7	−0.3
1950	4.2	2.7	3.1	−0.4	−8.0	2.5	8.2	−18.7	0.6
1951	4.8	1.9	2.0	−0.1	−7.4	3.2	8.2	−17.9	−0.3
1952	5.0	−1.1	−1.1	0.0	−4.2	2.4	8.4	−15.0	−0.2
1953	5.1	−1.9	−1.9	0.0	−4.1	2.0	8.5	−14.5	0.3
1954	4.6	−2.0	−1.7	−0.3	−3.1	2.3	9.0	−14.4	−0.1
1955	4.1	0.8	1.1	−0.3	−5.1	3.3	8.6	−17.1	−0.1
1956	5.0	1.2	1.4	−0.2	−5.1	2.5	9.1	−16.8	−0.6
1957	5.0	0.2	0.5	−0.3	−3.9	2.3	9.4	−15.6	−1.1
1958	5.2	−2.8	−2.3	−0.5	−2.3	1.8	9.7	−13.7	−0.2
1959	4.3	−0.3	−0.2	−0.1	−4.0	2.8	9.2	−16.0	0.2
1960	3.9	0.6	0.6	0.0	−3.5	2.4	9.2	−15.0	−0.6
1961	4.4	−0.8	−0.7	−0.1	−2.8	2.4	9.0	−14.2	−0.7
1962	4.1	−0.7	−0.7	0.1	−3.2	3.2	8.6	−15.1	−0.6
1963	3.7	0.1	0.0	0.1	−3.3	3.4	8.5	−15.2	−0.7
1964	4.6	−0.4	−0.5	0.2	−3.2	3.7	8.3	−15.3	−1.1
1965	4.9	0.1	0.1	0.0	−4.0	4.3	8.1	−16.4	−0.8
1966	4.8	−0.2	−0.2	0.1	−4.4	4.2	8.0	−16.6	−0.4
1967	5.5	−1.8	−1.6	−0.1	−3.4	3.7	8.2	−15.4	−0.3
1968	4.8	−0.7	−0.7	0.0	−3.8	3.2	8.2	−15.3	−0.1
1969	4.3	1.1	0.9	0.2	−4.9	2.4	8.4	−15.8	0.0
1970	5.6	−1.1	−1.2	0.2	−4.2	1.5	8.8	−14.5	−0.2

Table 2 (cont'd.)
Gross Saving and Investment as a Percent of GNP[1]
(in percent)

		Government Balance			Business Balance				
	Personal Saving	Total	Federal	State and Local	Total	Retained Earnings[2]	Capital Consumption[3]	Gross Investment[4]	Foreign Balance[5]
1971	5.6	−1.8	−2.0	0.2	−4.4	2.1	8.9	−15.4	0.1
1972	4.4	−0.3	−1.4	1.1	−4.9	2.6	9.0	−16.4	0.5
1973	5.9	0.6	−0.4	1.0	−6.1	2.4	8.8	−17.3	−0.5
1974	5.9	−0.3	−0.8	0.5	−5.5	0.9	9.5	−15.9	−0.3
1975	6.1	−4.1	−4.5	0.3	−1.1	1.9	10.3	−13.3	−1.2
1976	4.8	−2.1	−3.1	1.0	−2.7	2.2	10.2	−15.0	−0.3
1977	4.1	−0.9	−2.4	1.5	−3.9	2.8	10.1	−16.9	0.7
1978	4.1	0.0	−1.4	1.4	−4.7	2.9	10.3	−17.9	0.7
1979	4.0	0.6	−0.7	1.3	−4.7	2.3	10.6	−17.5	0.1
1980	4.2	−1.2	−2.3	1.2	−2.9	1.2	11.1	−15.3	−0.2
1981	4.6	−0.9	−2.1	1.2	−3.4	1.5	11.2	−16.1	−0.1
1982	4.1	−3.8	−4.8	1.0	−0.6	1.2	11.7	−13.5	0.3
1983[6]	3.3	−4.0	−5.4	1.4	0.1	1.8	11.6	−13.3	0.7

[1]All data taken from the table reconciling gross saving and investment in the National Income and Products Accounts.
[2]Undistributed corporate profits with inventory valuation adjustment and capital consumption adjustment.
[3]Corporate and noncorporate capital consumption allowances with capital consumption adjustment.
[4]Gross private domestic investment.
[5]Net capital grants received less net foreign investment.
[6]Average of first two quarters.

Table 3
Gross Investment as a Percent of GNP

		Fixed Investment			
	Total	Total	Nonresidential	Residential	Inventory
1946	14.6	11.5	8.0	3.5	3.1
1947	14.5	14.8	9.9	4.9	−0.2
1948	17.7	15.9	10.1	5.7	1.8
1949	13.7	14.8	9.4	5.4	−1.2
1950	18.7	16.4	9.5	6.9	2.3
1951	17.9	14.8	9.5	5.3	3.1
1952	15.0	14.1	9.0	5.1	0.9
1953	14.5	14.4	9.4	5.0	0.1
1954	14.4	14.8	9.3	5.5	−0.4
1955	17.1	15.6	9.6	6.0	1.5
1956	16.8	15.7	10.4	5.3	1.1
1957	15.6	15.3	10.6	4.7	0.3
1958	13.7	14.1	9.3	4.8	−0.4
1959	16.0	14.9	9.4	5.4	1.2
1960	15.0	14.4	9.6	4.8	0.6
1961	14.2	13.8	9.2	4.7	0.4
1962	15.1	14.0	9.2	4.8	1.1
1963	15.2	14.2	9.2	5.0	1.0
1964	15.3	14.4	9.6	4.8	0.9
1965	16.4	15.0	10.5	4.5	1.4
1966	16.6	14.8	11.0	3.8	1.9
1967	15.4	14.1	10.5	3.6	1.3
1968	15.3	14.4	10.4	4.0	0.9
1969	15.8	14.8	10.7	4.0	1.0
1970	14.5	14.2	10.5	3.7	0.3
1971	15.4	14.7	10.0	4.7	0.7
1972	16.4	15.6	10.2	5.4	0.9
1973	17.3	15.9	10.8	5.1	1.4
1974	15.9	15.0	10.9	4.0	1.0
1975	13.2	13.8	10.2	3.6	−0.5
1976	15.0	14.3	10.1	4.2	0.7
1977	16.9	15.7	10.7	5.0	1.2
1978	17.9	16.6	11.5	5.1	1.2
1979	17.5	16.9	12.0	4.9	0.6
1980	15.3	15.6	11.7	3.9	−0.4
1981	16.1	15.5	11.9	3.5	0.6
1982	13.5	14.3	11.3	3.0	−0.8
1983[1]	13.3	14.1	10.4	3.7	−0.8

[1]Average of first two quarters.

Table 4
Baseline Forecasts of Three Econometric Models[1]

	4 Qtr. Inflation Rate[2]	4 Qtr. Real GNP Growth Rate	Unemployment Rate	3 Mo. T Bill Rate	AAA Corporate Bond Rate	Federal Deficit/ GNP	Retained Earnings/ GNP[3]	Personal Saving/ GNP	Personal Consumption/ GNP[4]	Business Fixed Investment/ GNP[5]	Residential Investment/ GNP[6]	Net Exports/ GNP[7]	Total Government Purchases/ GNP[8]
						MODEL A							
1983:3–1984:2	4.9	4.5	8.9	9.0	11.8	5.2	2.2	3.3	66.1	10.4	3.4	0.2	19.1
1984:3–1985:2	5.6	3.9	8.1	8.6	11.5	4.6	2.5	3.1	65.8	10.6	3.5	0.2	19.0
1985:3–1986:2	6.1	3.4	7.7	8.7	11.9	4.3	2.7	3.5	65.4	11.1	3.5	0.2	18.8
1986:3–1987:2	6.9	3.1	7.3	8.0	11.8	3.4	3.0	3.5	65.0	11.3	3.7	0.3	18.3
1987:3–1988:2	6.4	3.1	6.9	7.5	11.5	2.7	3.1	3.2	65.0	11.7	3.6	0.4	17.9
						MODEL B							
1983:3–1984:2	3.9	3.8	9.2	8.4	11.6	5.4	2.6	3.4	66.1	11.0	3.2	0.0	18.8
1984:3–1985:2	4.4	4.3	8.5	7.2	10.3	4.6	2.8	3.0	65.3	11.8	3.2	0.0	18.7
1985:3–1986:2	4.1	4.2	7.7	7.2	9.1	3.4	3.2	2.8	64.4	12.7	3.7	0.2	18.1
1986:3–1987:2	4.2	3.1	7.2	6.9	8.5	2.5	3.4	2.4	64.0	13.4	4.1	0.1	17.7
1987:3–1988:2	3.8	2.4	7.2	5.5	8.0	1.9	3.6	1.7	63.7	13.8	4.5	−0.1	17.5
						MODEL C							
1983:3–1984:2	5.0	5.1	8.9	9.3	11.9	5.5	2.8	3.7	65.7	10.7	3.5	0.6	19.1
1984:3–1985:2	4.9	3.5	8.1	9.1	11.5	5.2	3.3	3.9	65.2	11.0	3.6	0.5	18.9
1985:3–1986:2	5.0	3.1	7.9	9.3	11.5	5.1	3.3	4.1	65.1	11.4	3.3	0.5	18.8
1986:3–1987:2	5.1	3.7	7.5	8.4	11.3	4.6	3.0	4.0	64.7	11.6	3.4	0.7	18.8
1987:3–1988:2	5.7	3.2	7.2	8.0	11.0	3.9	2.7	3.9	64.4	11.8	3.5	0.8	18.8

[1]These forecasts are the unadjusted simulation paths of the three models in late September 1983.
[2]Percent change in GNP deflator, fourth quarter over fourth quarter.
[3]Undistributed corporate profits with inventory valuation and capital consumption adjustment, matching the concept reported in Table 2.
[4]Real personal consumption as a percent of real GNP.
[5]Real business fixed investment as a percent of real GNP.
[6]Real residential investment as a percent of real GNP.
[7]Real net exports as a percent of real GNP.
[8]Total real government purchases as a percent of real GNP.

Table 5
Alternative Forecasts for Small Personal Tax Increases[1]
(Change From Baseline Forecast)

	4 Qtr. Inflation Rate	3 Mo. T Bill Rate	AAA Corporate Bond Rate	Federal Deficit/ GNP	Retained Earnings/ GNP	Personal Saving/ GNP	Personal Consumption/ GNP	Business Fixed Investment/ GNP	Residential Investment/ GNP	Net Exports/ GNP	Total Government Purchases/ GNP
						MODEL A					
1983:3–1984:2	+0.1	−2.5	−1.1	−1.1	+0.1	−0.6	−0.3	0.0	+0.2	+0.2	0.0
1984:3–1985:2	+0.1	−3.3	−2.1	−1.3	+0.1	−0.4	−0.6	0.0	+0.3	+0.2	+0.1
1985:3–1986:2	+0.2	−5.1	−3.7	−2.0	+0.1	−0.6	−1.0	0.0	+0.4	+0.5	+0.1
1986:3–1987:2	−0.1	−5.1	−4.9	−2.0	+0.2	−0.5	−1.3	0.0	+0.4	+0.9	+0.4
1987:3–1988:2	−0.2	−5.4	−5.6	−2.1	+0.2	−0.4	−1.5	+0.1	+0.4	+1.0	+0.5
						MODEL B					
1983:3–1984:2	0.0	−1.6	−0.4	−1.0	0.0	−0.8	−0.3	+0.1	+0.3	0.0	0.0
1984:3–1985:2	−0.1	+0.1	−0.3	−0.9	+0.1	−0.6	−0.2	+0.2	+0.2	0.0	0.0
1985:3–1986:2	+0.2	−0.3	−0.4	−1.4	+0.1	−1.0	−0.4	+0.2	+0.3	+0.1	0.0
1986:3–1987:2	+0.1	−0.2	−0.3	−1.6	+0.1	−0.9	−0.5	+0.2	+0.3	+0.1	0.0
1987:3–1988:2	+0.3	−0.5	−0.3	−1.4	0.0	−0.8	−0.5	+0.2	+0.3	+0.1	0.0
						MODEL C					
1983:3–1984:2	+0.1	−1.6	0.0	−1.0	+0.1	−0.7	−0.4	0.0	+0.2	0.0	+0.1
1984:3–1985:2	0.0	−0.9	+0.1	−1.0	0.0	−0.5	−0.5	+0.1	+0.2	+0.2	+0.1
1985:3–1986:2	+0.1	−2.1	+0.1	−1.6	+0.1	−0.9	−0.8	+0.1	+0.3	+0.3	+0.1
1986:3–1987:2	+0.1	−1.5	+0.1	−1.6	+0.1	−0.7	−0.8	+0.2	+0.3	+0.4	+0.1
1987:3–1988:2	+0.1	−1.5	+0.1	−1.6	0.0	−0.8	−0.9	+0.2	+0.2	+0.5	0.0

[1]Personal taxes increase $30 billion in FYs 1984 and 85 and $50 billion in FYs 1986, 87, and 88, while monetary policy is relaxed so that projected real GNP matches that of the baseline simulation.

Table 6
Alternative Forecasts for Medium Personal Tax Increases[1] (Change From Baseline Forecast)

	4 Qtr. Inflation Rate	3 Mo. T Bill Rate	AAA Corporate Bond Rate	Federal Deficit/ GNP	Retained Earnings/ GNP	Personal Saving/ GNP	Personal Consumption/ GNP	Business Fixed Investment/ GNP	Residential Investment/ GNP	Net Exports/ GNP	Total Government Purchases/ GNP
						MODEL A					
1983:3–1984:2	+0.1	−2.2	−1.0	−1.1	+0.1	−0.6	−0.3	0.0	+0.2	+0.2	0.0
1984:3–1985:2	+0.3	−5.3	−3.1	−2.2	+0.1	−0.9	−0.9	0.0	+0.4	+0.3	+0.1
1985:3–1986:2	+0.4	−8.1	−5.6	−3.6	+0.3	−1.2	−1.7	0.0	+0.8	+0.7	+0.2
1986:3–1987:2	*	*	*	*	*	*	*	*	*	*	*
1987:3–1988:2	*	*	*	*	*	*	*	*	*	*	*
						MODEL B					
1983:3–1984:2	0.0	−1.6	−0.4	−1.0	0.0	−0.8	−0.3	+0.1	+0.3	0.0	0.0
1984:3–1985:2	0.0	−1.5	−0.7	−1.9	+0.2	−1.4	−0.5	+0.2	+0.5	0.0	0.0
1985:3–1986:2	+0.2	−0.6	−0.8	−2.8	+0.2	−2.0	−0.9	+0.3	+0.7	+0.2	−0.1
1986:3–1987:2	+0.2	−0.1	−0.5	−2.7	+0.1	−1.8	−1.0	+0.4	+0.6	+0.2	−0.1
1987:3–1988:2	+0.5	−0.5	−0.4	−2.6	0.0	−1.5	−1.1	+0.3	+0.7	+0.2	−0.1
						MODEL C					
1983:3–1984:2	+0.1	−1.6	0.0	−1.0	+0.1	−0.7	−0.4	0.0	+0.2	0.0	+0.1
1984:3–1985:2	+0.2	−2.4	0.0	−1.9	0.0	−1.1	−0.8	+0.1	+0.4	+0.2	+0.1
1985:3–1986:2	+0.2	−3.6	+0.1	−3.0	+0.1	−1.7	−1.5	+0.2	+0.7	+0.5	+0.2
1986:3–1987:2	+0.2	−2.8	+0.2	−3.0	+0.1	−1.4	−1.6	+0.3	+0.7	+0.6	+0.1
1987:3–1988:2	+0.2	−2.6	+0.2	−3.0	+0.1	−1.4	−1.7	+0.3	+0.5	+0.8	0.0

[1]Personal taxes increase $30 billion in FY 1984, $60 billion in FY 1985, $100 billion in FYs 1986, 87, and 88, while monetary policy is relaxed so that projected real GNP matches that of the baseline simulation.

*Simulation stopped because short-term interest rates became negative.

Table 7
Alternative Forecasts for Large Personal Tax Increases[1]
(Change From Baseline Forecast)

	4 Qtr. Inflation Rate	3 Mo. T Bill Rate	AAA Corporate Bond Rate	Federal Deficit/ GNP	Retained Earnings/ GNP	Personal Saving/ GNP	Personal Consumption/ GNP	Business Fixed Investment/ GNP	Residential Investment/ GNP	Net Exports/ GNP	Total Government Purchases/ GNP
						MODEL A					
1983:3–1984:2	+0.1	−2.3	−1.1	−1.1	+0.1	−0.6	−0.3	0.0	+0.3	+0.2	0.0
1984:3–1985:2	+0.4	−7.5	−4.1	−3.5	+0.1	−1.5	−1.3	0.0	+0.6	+0.4	+0.1
1985:3–1986:2	*	*	*	*	*	*	*	*	*	*	*
1986:3–1987:2	*	*	*	*	*	*	*	*	*	*	*
1987:3–1988:2	*	*	*	*	*	*	*	*	*	*	*
						MODEL B					
1983:3–1984:2	0.0	−1.6	−0.4	−1.0	0.0	−0.8	−0.3	+0.1	+0.3	0.0	0.0
1984:3–1985:2	0.0	−3.6	−1.2	−2.9	+0.3	−2.3	−1.0	+0.2	+0.8	0.0	−0.1
1985:3–1986:2	+0.2	−0.2	−1.1	−4.2	+0.3	−3.0	−1.4	+0.5	+1.1	+0.3	−0.1
1986:3–1987:2	+0.3	−0.2	−0.9	−4.0	+0.2	−2.6	−1.6	+0.5	+0.9	+0.3	−0.2
1987:3–1988:2	+0.6	−0.5	−0.5	−3.9	+0.1	−2.3	−1.6	+0.5	+1.1	+0.3	−0.1
						MODEL C					
1983:3–1984:2	+0.1	−1.6	0.0	−1.0	+0.1	−0.7	−0.4	0.0	+0.2	0.0	+0.1
1984:3–1985:2	+0.4	−3.1	+0.1	−3.0	+0.1	−1.7	−1.3	+0.1	+0.8	+0.3	+0.2
1985:3–1986:2	*	*	*	*	*	*	*	*	*	*	*
1986:3–1987:2	*	*	*	*	*	*	*	*	*	*	*
1987:3–1988:2	*	*	*	*	*	*	*	*	*	*	*

[1]Personal taxes increased $30 billion in FY 1984, $100 billion in FY 1985, $150 billion in FYs 1986, 87, and 88, while monetary policy is relaxed so that projected real GNP matches that of the baseline simulation.

*Simulation stopped because short-term interest rates became negative.

by $30 billion in fiscal years 1984–1985, and by $50 billion in fiscal years 1986–1988. In Table 6, the tax increase is $30 billion in 1984, $60 billion in 1985, and $100 billion in 1986 to 1988. Finally in Table 7, personal income taxes rise $30 billion in 1984, $100 billion in 1985, and $150 billion in 1986 to 1988.

According to Table 4, all three models forecast fairly similar recoveries during the next five fiscal years. In all models the unemployment rate declines to about 7 percent by fiscal year 1988. In all models real growth averages 3.6 percent during the five year interval, and in fiscal year 1988 real growth in models A and C averages about 3 percent while real growth averages 2.4 percent in model B. Apparently the economy is making a smooth transition to a 7 percent unemployment rate.

Models A and C project the inflation rate to increase to roughly 6 percent in fiscal year 1988. As a result, the corporate bond yields in these models remain above 11 percent.[13] In model B the corporate bond yield drops to 8 percent as the inflation rate falls below 4 percent in 1988.

The models project different budget deficits. Model B assumes that indexing of the personal income tax will not take place as scheduled in 1985, and it forecasts a steady decline in the deficit as a percent of GNP to 2 percent.[14] Models A and C assume that indexing will take place and forecast that federal deficits will fall to 3 or 4 percent of GNP in fiscal year 1988. All of these estimates are considerably below those shown in the first column of Table 1.

In models A and C, investment as a percent of GNP rises about 1 percentage point over the five years. In B investment increases almost 3 percentage points. In all models investment spending appears to be rising to at least 12 percent of GNP by the end of fiscal year 1988. In C, retained earnings fail to rise relative to GNP, while earnings rise about 1 percentage point in models A and B.

Despite similarities in their baseline forecasts, the three models respond differently to these changes in policy mix. In model A all interest rates decline dramatically to increase net exports and investment demand enough to match the decline in consumption spending resulting from the small tax hike. For the medium and large tax hike simulations, no feasible drop in yields could maintain the GNP growth path. In model B personal savings drops somewhat more with the tax hike, and, because the interest elasticity of net exports and investment spending is greater than in A, interest rates fall much less. In model C personal saving declines almost as much as savings in B, and yields decline more than in B but not as much as in A to foster adequate spending.

In all three models the alternative policy mixtures modestly increase real business fixed investment as a percent of GNP. This result is not too surprising because these changes in policy mix do not alter real GNP growth,

[13]Suppose a bond buyer's marginal tax rate is 35 percent, then the real yield after taxes appears to be about 1 percent in fiscal year 1988 according to all three models.

[14]With model B's low inflation forecast, the lack of indexing raises personal tax rates only modestly by 1988.

and the inflation rate changes very little in these alternative simulations. Consequently, corporate retained earnings and the corporate bond yield also change very little as the policy mix changes in models B and C.

In all models, the combining of personal income tax hikes with more lenient monetary policy principally reduces consumption spending to favor net exports and residential construction. For model B, the alternative policy mixtures reduce interest rates negligibly. For model A interest rates must drop so much that the alternative policies featuring medium and large tax hikes are not feasible. Finally, in model C the switch to more lenient monetary policies alters bond yields very little while short-term interest rates fall considerably. For example, in the medium tax hike alternative for model C, the gap between long-term and short-term yields remains near 500 basis points for fiscal years 1986 to 1988. The "stability" of this projection may be questionable: for at least three years, short-term yields remain far below bond yields and barely match the rate of inflation.

Perhaps model C best represents the effects of changing the policy mixture.[15] The small tax hike policy mix cuts the federal deficit about 40 percent by 1988, reducing it to about 2.3 percent of GNP. The medium tax hike simulation reduces the deficit to about 1 percent of GNP. For both of these alternative strategies, households pay for the tax hike by reducing both saving and spending, with consumption spending falling only 10 to 20 percent more than personal saving by 1988. Consequently, the increase in total fixed investment spending and net exports together is a little more than half the size of the tax hike because government spending and inventory investment change negligibly in the alternative simulations shown in Tables 5 and 6.

Although net exports increase very little at first, by 1988 the rise in net exports roughly matches that of total fixed investment spending in Tables 5 and 6. Net exports and total investment spending each eventually rise by about one-quarter of the amount of the personal tax hike. In turn, a little more than half of the increase in total investment is accounted for by home building so the increase in business fixed investment is about one-tenth the size of the tax hike.

In summary, the alternative blends of policy raise government saving by the amount of the personal income tax hike. Because these alternative policy strategies, by design, do not change national income (GNP), the rise in government tax receipts essentially is offset by a matching drop in household disposable income. The resulting increase in government saving is matched by a relatively large rise in household borrowing (almost three-quarters of the increase in government saving), a decline in capital flows from abroad (about

[15]The interest elasticities of investment spending and net exports appear to be relatively low for model A. For those who believe the accelerator theory best describes investment demand (Kopcke 1982), etc., model A may be the most realistic alternative, however. Those who maintain model B believe that their exchange rate equation has a "surprising" response to increasing deficits; the dollar depreciates as deficits rise. As a result, simulations shown in Tables 5 to 7 understate the rise in net exports and, consequently, overstate the change in other spending. Altogether, then, the responses of interest rates, spending, and personal saving appear to be most plausible for model C.

one-quarter of the increase in government saving), and a very small increase in business borrowing.[16]

III. Conclusion

According to common projections, the federal government's budget deficit may remain near 5 percent of GNP well into the late 1980s. To some, big deficits apparently suggest that fiscal policy is too lenient: the recovery will violate prudent speed limits, aggregate demand will exceed supply once high employment is attained, and the volume of investment spending will be inadequate because high employment production is not sustainable under these conditions or because a restrictive monetary policy must drive up interest rates.

To begin to assess our current fiscal policy, we should consider first our current and prospective circumstances. The economy is not now near full employment, nor has it been near full employment for at least three years. Aggregate demand apparently falls well short of supply at high employment GNP. Consequently, the appropriate fiscal policy may entail large deficits.

Nevertheless, common projections of very large deficits seem to suggest that fiscal policy has gone too far. The model forecasts shown in Table 4, representing the consensus forecast, suggest otherwise. Given our circumstances, including the course of monetary policy currently expected by forecasters, fiscal policy does not seem to be pushing the recovery beyond any speed limits. Indeed, five years from now the unemployment rate will be about 7 percent as the economy's growth rate slows to match the rate of potential growth.

Even though the current strategy will produce a gradual recovery, it may not be the best policy for restoring full employment. To assess alternative strategies, several model simulations were performed that combined personal income tax increases with more lenient monetary policy. The results of these simulations, shown in Tables 5 to 7, are not very encouraging for those who hope to stimulate business fixed investment by changing the policy mix, however. Swapping tighter fiscal policy for a more lenient monetary policy seems to raise business fixed investment relatively little because the swap, by design, does not alter the growth of GNP and, therefore, does not increase corporate profits or reduce either the inflation rate or bond yields. Models can err, of course, but this conclusion sounds intuitively plausible. Of course, this is only one set of experiments; more complex changes in tax rules—including more investment incentives, for example—may achieve greater success.

[16]In model B, the rise in household borrowing is 80 percent of the increase in government saving because of the small change in net exports. In model A, for the small tax hike, the rise in total government saving is less than the tax hike because low interest rates induce additional state and local government spending. In this model, the drop in interest rates is also large enough to increase net exports dramatically. As a result, the increase in household borrowing is about half the size of the rise in total government saving as consumption spending falls dramatically.

The case for a new policy mix featuring a more restrictive fiscal policy does not rest entirely on fostering business fixed investment. Policymakers may wish to reduce short-term interest rates, thereby encouraging home building, reducing exchange rates, boosting net exports, or reducing the debt service costs of developing countries. The policy simulations for model C shown in Tables 5 and 6 suggest that net exports, after a few years, will rise by one-quarter of the amount of a personal tax hike and residential investment will rise by one-sixth of the amount of the tax hike. The models also suggest that long-term yields cannot be reduced by changes in the mix of monetary and fiscal policies. Short-term yields may decline, but if they do so, they will be out of line with long-term yields and inflation.

If we desire a more rapid recovery of investment spending (especially home building), higher net exports and lower debt servicing costs for developing countries, without increasing GNP growth, economic theory recommends a tax hike structured to encourage capital deepening coupled with a more lenient monetary policy.[17] Social priorities permitting, a spending cut may also be considered. Tax hikes alone are a bad bet. Tax hikes by themselves can reduce interest rates and the deficit, but these ends are achieved at the expense of investment spending and GNP growth. It is a bad bet for policymakers to turn from their ultimate goals to follow intermediate targets that can be misleading statistics.[18]

[17]It is not clear whether monetary policy can influence investment incentives at full employment. For example, in some growth models the intertemporal discount rate is fixed by the utility function (Sidrauski 1967); in others the intertemporal discount rate is determined by the saving rate and portfolio balance relationships (Tobin 1965). In the former, monetary policy cannot influence capital intensity; in the latter, monetary policy can influence the rate of capital formation by depressing the real return on money, that is by increasing inflation.

[18]Let g, an endogenous variable, be the goal and i be the intermediate target. Steering i along some preset path would offer little guarantee that g would meet its target, unless the reduced form equations for i and g were $i = f(X)$ and $g = h(Z, f(X))$ where the variance of Z is small or Z has "little influence" (say, small beta coefficients). (I assume the target for i is not set independently of the function h and forecasts of Z.) A close correlation between i and g or Z and X is no guarantee that these conditions are satisfied because by controlling i the correlation structure between Z and X is altered. (See also B. Friedman 1977.)

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Discussion

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Kopcke's paper addresses a central question: Are deficits at 5 percent of GNP extending into the indefinite future anything to worry about? Kopcke's answer, in short, is no. In fact, he even raises the possibility that they should be larger. For example, in his conclusion he states that because the economy is so far below full employment, "the appropriate fiscal policy may entail large deficits." He implies that they should be even larger than 5 percent of GNP when he goes on to state, "fiscal policy does not seem to be pushing the recovery beyond any speed limits. Indeed, five years from now the unemployment rate will be about 7 percent...."

I am not persuaded by Kopcke's arguments. He uses an IS-LM model and three large macroeconometric models to seek answers to his deficit question—analytical tools which I believe are inadequate for the problem at hand. Instead, based on an equilibrium growth model which can address the question, I conclude that financing a permanent deficit at 5 percent of GNP will require significant inflation.

Kopcke's Macroeconomic Analysis Is Inadequate

The macroeconomic models Kopcke uses to examine the economic consequences of permanent deficit policies are inadequate for at least three reasons. First, they cannot distinguish among alternative debt financing rules. Second, the macro relationships in these models cannot be expected to remain invariant under a change from historical deficit policies to one of large, permanent deficits (according to the Lucas critique). Third, they cannot address the optimal tax structure questions which are basic to the issue of permanent deficit financing. Each reason is discussed in more detail below.

• Kopcke's Models Cannot Distinguish among Alternative Debt Financing Policies

Theory and common sense suggest that the path of prospective deficits, which is determined in part by the government's debt financing rule, should affect expectations of interest rates and inflation, thereby affecting behavior today. A deficit caused by a temporary tax cut and for which the resulting debt is serviced by higher taxes in the future is quite different from a deficit caused by a permanent tax cut and for which the resulting debt is serviced by increased money creation and bond issue in the future. Yet, Kopcke's IS-LM and macroeconometric models make no such distinction.

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The views expressed in this comment are those of the author and not necessarily those of the Federal Reserve Bank of Minneapolis or the Federal Reserve System.

For example, changing the financing rule to service more debt by higher taxes in the future and, thus, to lower the path of prospective deficits has no effect in Kopcke's models in the current period. Such a change in rule in these models only has effects as the tax increases actually take place, and each tax increase unambiguously lowers real output when it takes effect. So as long as the economy is below full employment, these models will always suggest that, no matter what deficits are today, they should be even larger. That is because policy actions which raise deficits are always stimulative and the financing of the resulting debt is irrelevant.

Given this unattractive implication of these models, it is not surprising that Kopcke and others at this conference play the game of examining different mixes of monetary and fiscal policies while holding the path of GNP constant. It would be more direct and natural to hold the path of money constant and then ask how large the deficits should be to stimulate GNP in order to return the economy promptly to full employment. Since the answer would be that the deficits should be even larger than the huge ones now projected, having the models address this natural question would make their deficiencies too apparent.

- **The Relationships in Kopcke's Models Are Not Invariant to a Change in Deficit Policies**

Although deficits at 5 percent of GNP have occasionally occurred in the past at times of recession, they have never persisted at that level as the economy recovered. Thus, the deficit policy being contemplated now is very different from the policy or policies which were in effect in the past. For reasons spelled out in Lucas and Lucas-Sargent we cannot expect macroeconomic relationships to remain invariant under such a change in policies. The estimated responses of interest rates and inflation to larger deficits under the prospective deficit policy are likely to be very different from their responses under the historical policy. (See Miller 1983 for evidence that these responses are sensitive to the policy in effect.)

- **Kopcke's Models Cannot Address Optimal Tax Structure Questions**

In considering a policy of permanent deficits the question naturally arises, How is it possible for the government to permanently spend more than it takes in? In a real sense it cannot. The resources which go out must come in. A permanent deficit policy can be feasible if implicit taxes can raise the amount by which expenditures exceed explicit revenues. Thus, a desirable permanent deficit policy is one which produces a desirable mix between explicit and implicit taxes. It is a question of optimal tax structure, with distorting explicit and implicit taxes. Because Kopcke's macro models consider neither individual welfare nor deadweight losses associated with alternative taxes, they simply are not constructed to deal with questions of optimal tax structure.

Equilibrium Growth Models Can Analyze Persistent Deficit Policies

Equilibrium growth models, such as those of Bryant-Wallace, Lucas-Stokey, and Miller (1982), can be used to analyze persistent deficit policies. Because they are explicitly micro based and dynamic in nature, they are not subject to the criticisms made of Kopcke's models. (See Miller-Rolnick for a fuller discussion of equilibrium modelling.)

I do agree with Kopcke that it would be preferable to have a model which can deal in a unified way with countercyclical and growth issues. Countercyclical policy is concerned with how large the deficits should be in recessions and how fast they should be reduced in recoveries to smooth the business cycle. Growth policy is concerned with how large deficits should be on average over the business cycle in order to promote real growth. The deficit question being addressed deals primarily with the second policy concern. Until models are developed which can deal with both growth and countercyclical issues, it then seems most logical to analyze Kopcke's deficit question in terms of steady states of equilibrium growth models, if we think of steady state as meaning average over the business cycle.

• **The Steady-State Budget Identity Is a Useful Frame of Reference**

Most of the implications I want to draw from equilibrium growth models for permanent deficit policies can be briefly described by referring to the government's steady-state budget identity:

$D = t_m \cdot M + t_B \cdot B$, where

$D =$ the real deficit net of interest

$M =$ the real monetary base

$B =$ the real market value of privately held government bonds

$t_m =$ the implicit tax rate on money

$t_B =$ the implicit tax rate on bonds.

This relationship is derived assuming a constant rate of inflation Π, a constant real interest rate ρ, and a constant rate of real growth υ. For given rates Π, ρ, and υ, the income velocities of M and B are assumed invariant over time (see Miller 1983 for more detail). The identity states that the difference between government expenditures and explicit revenues must be collected in implicit taxes on money and bonds.

The implicit tax rates are simple functions of the key economic variables Π, ρ, and υ. Given my assumptions, the implicit tax rate on money is approximately the sum of inflation and real growth, $t_m \approx \Pi + \upsilon$, and the implicit tax rate on bonds is approximately the difference between real growth and the real interest rate, $t_B \approx \upsilon - \rho$. The expression for the implicit tax rate on

bonds, for example, indicates that bond issue provides a steady stream of revenue to the government when the growth in real demand for bonds v is greater than the cost of servicing the bonds outstanding ρ.

Some qualitative implications about deficit policies can be drawn from the steady-state budget identity and general considerations of money and bond demands. An immediate implication is that permanent deficits are feasible only when they do not exceed the maximum take from implicit taxes. The maximum take will depend on, among other things, institutional factors in the economy which affect the demands for money and bonds and demographic factors which affect real growth.

The identity, together with a theory of the demands for M and B, implies that deficit policies (paths of D) and monetary policies (paths of M) must be coordinated. For a given deficit policy there are a limited number of monetary policies which are feasible.[1] The feasible policies are the ones which generate the implicit taxes required to finance the real deficit net of interest.

The identity and theory also imply that the incidence of deficits depends on the mix of implicit taxes. A monetary policy characterized by a lower M/B leads to more crowding out. A policy which relies on greater use of inflation as an implicit tax leads to economizing on money balances.

Within this framework of optimal tax structure, a policy which permanently lowers explicit taxes could, conceptually, either raise or lower real GNP. Such a change in policy just changes the mix of explicit and implicit taxes, and the outcome depends on whether policy is moved closer to or further away from the optimal mix.

• The Steady-State Budget Identity Indicates Projected Deficits Could Require High Inflation

On very optimistic assumptions the steady-state budget identity implies that a permanent deficit at 5 percent of GNP requires a steady-state inflation rate of 6 percent. The risk—and the probability—however, is that it is much higher.

My back-of-the-envelope calculation determines what inflation rate is needed this year to finance a deficit at roughly 5 percent of GNP, assuming specific long-run average values for ρ and v. Given my steady-state assumptions, this inflation estimate works for all time. To get D, I take 5 percent of current GNP, roughly \$150b, and subtract interest payments, roughly \$90b, so that D = \$60b. I take M to be \$200b and B (which should be the stock of outside, or unbacked, bonds in private hands) to be \$1,000b. I assume this ratio of M to B is maintained over time. Then, assuming optimistically that v = 4 percent and ρ = 0 implies Π = 6 percent:

$$D = (\Pi + v)M + (v - \rho)B,$$

which under my assumptions becomes $60 = (\Pi + .04)(200) + (.04 - 0.0) \times (1{,}000)$ or $\Pi = .06$.

[1]A monetary policy can be characterized by the initial stock of money to bonds, M/B, and by the growth of money and bonds over time, $\dot{M}/M = \dot{B}/B$.

The identity and assumptions imply the following: (a) for each percentage point increase in the real interest rate, the steady-state inflation rate rises by 5 percentage points; (b) for each percentage point decline in the rate of real growth, the steady-state inflation rate rises by 6 percentage points. Thus, a deficit net of interest of 2 percent of GNP with steady-state rates of real growth and interest of 3.5 percent and 1.0 percent, respectively, requires a 14 percent steady-state inflation rate.

Large, Permanent Deficits Are a Matter for Concern

In summary, I am concerned about the prospect of permanent deficits at 5 percent of GNP. They imply that we must implicitly tax roughly 2 percent of GNP. I believe, but cannot substantiate, that implicit taxes are distorting relative to available explicit taxes. If these deficits crowd out and cause the difference between the real growth rate and real interest rate to be narrower than it appears to have been historically, we are going to have a lot of inflation.

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