

The Supply-Side Consequences of U.S. Fiscal Policy in the 1980s

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In the wake of deteriorating economic performance in the 1970s, a reassessment of the role of government became an increasingly important part of the U.S. policy agenda. Concern that excessive regulation of industry and misdirected federal spending and tax policies were hurting long-run economic performance led to a strong interest in streamlining the role of the public sector. In response, the Carter Administration (1977-80) introduced substantial deregulatory measures in several industries, including airlines, trucking, railroads, energy, and finance. In 1980, President Carter also proposed policy changes aimed at reducing federal spending as a share of GNP and simultaneously providing significant tax incentives for business investment (Council of Economic Advisers, 1981, pp. 9-12).

The first Reagan Administration (1981-84) attached much greater importance to reducing the role of government. In President Reagan's words

My first and foremost objective has been to improve the performance of the economy by reducing the role of the Federal Government in all its many dimensions. This involves a commitment to reduce Federal spending and taxing as a share of gross national product. It means a commitment to reduce progressively the size of the Federal deficit. It involves a substantial reform of Federal regulation, eliminating where possible and simplifying it where appropriate. It means eschewing the stop-and-go economic policies of the past which, with their short-term focus, only added to our long-run economic ills. (Council of Economic Advisers, 1982, pp. 4-5).

In the early 1980s, the increased emphasis on reducing the fiscal role of government reflected to some extent the influence of the "supply-side" economists, who felt that shrinking the size of government would aid economic growth.¹ The "supply-siders" viewed tax policy as the centerpiece of fiscal policy and believed that it should be aimed at long-run economic growth rather than short-run stabilization. Reductions in marginal tax rates, they believed, would greatly stimulate long-run growth by increasing the supply of labor and capital and, more generally, by improving the allocation of resources. Consequently, some supply-siders even asserted that the tax cuts would "pay for themselves": a rise in the tax base would mitigate or prevent the fall in tax revenue. Most economists doubted such a "Laffer curve" effect, but they shared the view that changes in U.S. tax policy were needed to remove tax distortions and improve resource allocation. In any event, by the mid-1980s the influence of the supply-siders had subsided but the debate about the role of federal spending and tax policies continued. More recently, the fiscal agenda has been dominated by efforts to deal with the continuing large federal deficits.

Against this background, this article reviews the principal changes in U.S. fiscal policy since the early 1980s and their implications for economic performance. We focus on developments in three broad areas of fiscal policy—budget deficits, expenditures, and taxes—and investigate how these developments have affected the basic determinants of potential growth—saving and capital formation, labor supply, and productivity. At the

¹See Fullerton (1990) for an overview of supply-side economics in the 1980s, including citations of statements by the supply-siders.

outset, we note that this review covers the supply-side implications of all the major fiscal policy developments rather than focusing on the particular set of policies recommended by the U.S. supply-siders

The supply-side consequences of fiscal policy changes in the 1980s appear to have been mixed. The persistently large budget deficits have clearly hurt saving, investment, and the long-run growth potential of the economy. Similarly, the decline of public investment in infrastructure over the 1980s has had adverse effects on productivity and potential output. Several important changes in the tax structure, however, appear to have been beneficial in creating incentives to increase the supply of output. Even so, on balance, changes in U.S. fiscal policy since the early 1980s have been detrimental to the growth potential and long-run economic performance of the economy

Long-run macroeconomic performance and fiscal policy

To provide general background for our review of fiscal policy, Table 1 reports data on five major macroeconomic indicators—output, employment, prices, productivity, and capital stock.² Following a weak per-

formance in the early 1970s, output and employment rose rapidly in the second half of the decade. Inflation continued to increase, however. Moreover, despite continuing strong growth of capital stock, both overall and manufacturing productivity growth slipped substantially.

On the whole, these indicators do not suggest a major improvement in economic performance in the 1980s. Output growth for the decade averaged about the same as in the 1970s, but employment growth was significantly weaker. In the second half of the 1980s, both output and employment growth were below the rates of the late 1970s. The inflation performance, however, improved greatly over the 1980s relative to the earlier period. Productivity growth, especially for the manufacturing sector, also showed considerable improvement in the 1980s even as capital stock growth weakened substantially. This slowdown in capital formation implies, *ceteris paribus*, a significant deterioration in productivity performance in the long run.

Although these broad indicators do not suggest a supply-side "revolution" in the 1980s, it is possible that a fiscal-policy-induced revolution did occur but was obscured by other developments in the economy. To get a clear sense of the supply-side impact of fiscal policy, we must ultimately focus on the growth of potential output—the amount of output that can be produced

²For further details, see Akhtar and Harris (1991)

Table 1

Broad Economic Indicators

Annual Percent Change

| | Real GNP | Employment | Consumer Prices [†] | Output per Hour | | Real Net Capital Stock | | Potential GNP [§] |
|--------------------------------|----------|------------|------------------------------|-------------------------|-----------------------------------|------------------------|---------------|----------------------------|
| | | | | Nonfarm Business Sector | Manufacturing Sector [‡] | Total Private | Manufacturing | |
| Ten-Year Averages | | | | | | | | |
| 1960-70 | 3.9 | 1.8 | 2.6 | 2.4 | 2.8 | 4.5 | 4.7 | |
| 1970-80 | 2.9 | 2.4 | 7.2 | 1.2 | 1.9 | 3.8 | 3.7 | |
| 1980-90 | 2.5 | 1.7 | 4.9 | 0.9 | 2.9 | 2.6 | 1.8 | |
| Five-Year Averages | | | | | | | | |
| 1970-75 | 2.4 | 1.8 | 6.6 | 1.8 | 3.0 | 3.9 | 3.6 | |
| 1975-80 | 3.3 | 3.0 | 7.9 | 0.5 | 0.8 | 3.6 | 3.8 | |
| 1980-85 | 2.4 | 1.5 | 5.5 | 1.3 | 2.7 | 2.9 | 2.0 | |
| 1985-90 | 2.7 | 1.9 | 4.3 | 0.5 | 3.1 | 2.2 | 1.5 | |
| Business Cycle Averages | | | | | | | | |
| 1960-73 | 4.0 | 2.0 | 3.1 | 2.5 | 3.3 | 4.4 | 4.4 | 3.3 |
| 1973-80 | 2.2 | 2.3 | 8.3 | 0.4 | 0.6 | 3.6 | 4.0 | 2.9 |
| 1980-90 | 2.5 | 1.7 | 4.9 | 0.9 | 2.9 | 2.6 | 1.8 | 2.5 ^{††} |

[†]Implicit deflator for personal consumption expenditures

[‡]For periods prior to 1977, data published before the 1991 benchmark revision of the National Income and Product Accounts are used

[§]Braun's (1990) estimates based on Okun's law and consistent with the natural rate of unemployment

^{||} Estimate for 1965-73

^{††} Estimate for 1980-87

without upward pressures on inflation. The channels of fiscal effects on potential growth, however, can be quite complex and can operate with long lags, so that the actual performance of the economy in the 1980s may not fully reflect the fiscal actions of that period.

Changes in fiscal policy affect the growth of potential output through saving, investment, the supply and quality of labor, efficiency in the allocation of public sector resources, and incentives for allocative efficiency in the private sector. All three broad areas of fiscal policy—deficits, expenditures, and taxes—may influence saving, although through significantly different channels. Higher budgetary deficits reduce the amount of national saving directly, while expenditure and tax policies may create incentives to increase or reduce private saving. Moreover, by influencing saving, capital costs, and public sector spending on infrastructure, all three broad areas of fiscal policy also affect capital formation.

Normally, deficits do not cause, at least directly, any changes in the supply and quality of the labor force or in the efficiency of resource allocation. Changes in the nature and composition of expenditures, by contrast, may have significant effects on the supply and quality of labor and on efficiency in the allocation of public sector resources. For example, spending on welfare programs affects work incentives, education spending bears on labor quality, and government investment influences private sector productivity. Changes in tax policy also may alter potential output by influencing the supply of labor and allocative efficiency of the private sector. The bulk of these effects result from changes in the rates and coverage of income taxation.

In what follows, we review the implications of developments in deficits, expenditures, and tax policy for the main determinants of potential output. Specifically, the next section looks at budget deficit developments and their implications for saving, capital formation, and potential output. Major changes in the structure of expenditures and taxes and their consequences for potential output are examined in the following two sections. Although our discussion deals primarily with the federal government sector, we have attempted to include state and local government activities where appropriate and possible. Our limited coverage of the state and local government sectors does not appear to be a serious problem for this analysis because recent changes in U.S. expenditures and taxes are dominated by federal activities.

Long-run economic growth consequences of deficits

The federal budget deficit averaged 3.6 percent of GNP in the 1980s, double its level in the 1970s (Table 2). After showing considerable improvement in the late

1970s, the deficit climbed sharply from below 1 percent in 1979 to over 5 percent of GNP in 1983, hovered around 4½ percent through 1986, and then declined gradually to 3 percent in 1990. The structural (that is, cyclically adjusted) deficit also deteriorated substantially to just above 3 percent of potential GDP in the second half of the 1980s from about 2 percent in the second half of the 1970s. With the combined state and local government surplus providing a partial offset, the overall public sector deficit was 2.4 percent of GNP over 1986-90, up from 0.8 percent of GNP over 1976-80. Throughout the period, the trend of the overall public sector deficit was dominated by the trend of the federal deficit, although the combined state and local government surplus, which reflects social insurance fund contributions (mostly pensions for public employees), increased significantly from 1980 to 1984 and declined gradually thereafter.

The federal budget deficits have been financed almost exclusively by borrowings from the private sector. As a result, the generally declining postwar trend of the federal debt relative to GNP was reversed in the early 1980s. Federal debt held by the public rose to 45 percent of GNP in 1990 from about 27 percent in 1980.

National saving

The federal budget balance, calculated on a national income accounts basis, measures the direct contribution of the federal government to the pool of national saving. That is, each dollar of deficit represents a dollar of lost national saving. As Table 3 indicates, the federal sector has been an increasing drag on national saving since the early 1970s. More specifically, from the 1970s to the 1980s the worsening federal deficit accounted for, on average, 55 percent of the decline in net national saving as a share of GNP. Using the average deficit over 1961-80 as the benchmark raises the direct contribution of the deficit's share of the saving decline to nearly 70 percent. The portion of the decline in the national saving rate attributable to the public sector as a whole is considerably smaller because the state and local government sector has experienced a budgetary surplus over the 1980s. Including the state and local surpluses, however, probably understates the extent of dissaving by the public sector: these surpluses reflect the growth in pensions for public employees and are conceptually more like private saving than government saving.

In principle, government deficits can also affect private saving through several channels. One such channel, much debated in academic circles, is suggested by the "Ricardian Equivalence" doctrine, which holds that when deficits rise, households increase their saving by an equal amount in order to pay the postponed taxes in

Table 2

Government Budgetary Deficit and Debt

Percent of GNP

| | Deficit (-) or Surplus [†] | | | Cyclically Adjusted Federal Deficit (-) [‡] | Government Debt Held by the Public | | Deficit (-) or Surplus | |
|---------------------------|-------------------------------------|-----------------------|-------|---|--|-------|--|---|
| | Federal | State and Local | Total | | Federal | Total | Federal Excluding Net Interest Payment | State and Local Excluding Social Insurance Funds |
| | | | | | | | | |
| Ten-Year Averages | | | | | | | | |
| 1961-70 | -0.4 | 0.1 | -0.3 | -1.2 | 36.7 | 50.8 | 0.9 | -0.5 |
| 1971-80 | -1.8 | 0.8 | -1.0 | -1.9 | 27.3 | 40.3 | -0.3 | 0.0 |
| 1981-90 | -3.6 | 1.0 | -2.6 | -3.0 | 38.3 | 51.4 | -0.7 | -0.1 |
| Five-Year Averages | | | | | | | | |
| 1971-75 | -1.8 | 0.6 | -1.2 | -1.6 | 27.0 | 41.0 | -0.5 | -0.1 |
| 1976-80 | -1.8 | 1.1 | -0.8 | -2.2 | 27.6 | 39.6 | -0.2 | 0.2 |
| 1981-85 | -4.1 | 1.2 | -2.9 | -2.7 | 33.3 | 44.6 | -1.3 | 0.0 |
| 1986-90 | -3.2 | 0.8 | -2.4 | -3.2 | 43.2 | 58.2 | -0.2 | -0.3 |
| Projection | | | | | | | | |
| 1991-95 | -3.5 [§] | | | -2.8 | | | | |

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

[†]Calculated on a National Income and Product Accounts basis.[‡]Congressional Budget Office estimates on a fiscal year basis, expressed as a percentage of potential GDP.[§]Congressional Budget Office projections on a fiscal year basis, expressed as a percentage of GDP.

Table 3

Net Saving and Investment

Percent of GNP

| | Net National Savings | | | | International Inflow or Outflow (-) of Saving [†] | Net External Investment Position [‡] | | Net Private Investment | Depreciation [§] |
|---------------------------|----------------------|---------|---------|-----------------------|---|---|------|------------------------------|---------------------------|
| | Total | Private | Federal | State and Local | | A | B | | |
| | | | | | | | | | |
| Ten-Year Averages | | | | | | | | | |
| 1961-70 | 7.9 | 8.3 | -0.4 | 0.0 | -0.6 | | 7.2 | 8.4 | |
| 1971-80 | 7.0 | 8.0 | -1.8 | 0.8 | -0.2 | 3.9 | 7.1 | 10.0 | |
| 1981-90 | 3.5 | 6.1 | -3.6 | 1.0 | 1.9 | -4.2 | 1.1 | 11.4 | |
| Five-Year Averages | | | | | | | | | |
| 1971-75 | 7.3 | 8.4 | -1.8 | 0.6 | -0.4 | 3.9 | 7.0 | 9.3 | |
| 1976-80 | 6.8 | 7.5 | -1.8 | 1.1 | -0.0 | 3.9 | 11.2 | 10.6 | |
| 1981-85 | 4.3 | 7.1 | -4.1 | 1.2 | 1.2 | 1.8 | 7.5 | 11.8 | |
| 1986-90 | 2.7 | 5.1 | -3.2 | 0.8 | 2.5 | -10.1 | -5.4 | 11.0 | |

Note: Components may not add to totals because of rounding. In addition, for selected years in the period 1970-81 total net national saving includes small amounts of net capital grants received by the United States, which are not shown separately.

[†]Net foreign investment, which equals the saving-investment gap excluding a small statistical discrepancy.[‡]Averages of year-end data: the first column, A, uses direct investment on a book value basis, the second column, B, evaluates direct investment on a current cost basis.[§]Consumption of fixed capital.

the future.³ Even in theory this doctrine holds only under some very strong assumptions such as infinite planning horizons and perfect capital markets without liquidity or credit constraints. Moreover, the recent experience of rising deficits and falling private saving is difficult to reconcile with the Ricardian Equivalence doctrine.

Deficits may also affect private saving by pushing up interest rates. The interest elasticity of private saving, however, appears to be quite low and therefore any such effects are likely to be small (see Haliassos and Tobin 1991, pp. 911-12; Smith 1990; and Congressional Budget Office 1989). Indeed, despite substantially higher real interest rates in the 1980s relative to the earlier period, the private saving rate has fallen.

A part of the decline in the national saving rate in the 1980s has been offset by foreign saving inflows to the United States (Table 3). The budget deficit, through upward pressures on interest and exchange rates and through increased consumption spending, has clearly helped to induce foreign saving inflows. But other macroeconomic developments, both domestic and international, have played a large role in the evolution of U.S. external balances during the last ten years or so (Akhtar 1989). The complexity of factors underlying the U.S. external position makes it very difficult to quantify the effects of the budget deficit relative to other determinants of the external position.

In any event, the inflow of foreign saving is a double-edged sword. By offsetting a part of the decline in national saving, it does make more funds available for investment than would otherwise be the case. However, the foreign saving inflow also represents increases in the U.S. external debt, the servicing of which will use up future saving and other productive resources of the economy. In the long run, therefore, the continued inflow of foreign capital places an additional burden on the economy. As reported in Table 3, the U.S. net external position has deteriorated rapidly since the late 1970s. On a current cost basis for direct investment, the nation has moved from a net creditor position of more than 13 percent of GNP in 1980 to a net debtor position of around 7½ percent of GNP in 1990. On a historical cost basis for direct investment, the deterioration is similar, from a net creditor position of 4 percent of GNP to a net debtor position of nearly 13 percent of GNP.

Capital formation and potential output

Capital formation has been weaker in the 1980s than in the earlier period. In particular, the ratio of net investment to GNP fell from about 7 percent in the 1970s to 5 percent in the late 1980s (Table 3). Measures of real

capital stock show a similar trend: total private capital stock and especially its manufacturing component have grown at a much slower pace in the last decade than in the earlier period (Table 1).⁴

By reducing national saving, the budget deficit has clearly played a major role in lowering the rate of capital formation. The deficit has affected investment through a number of interrelated channels. First, since the budget deficit must be financed regardless of the level of interest rates, increased government borrowing against the small pool of private saving has exerted upward pressures on interest and exchange rates, depressing investment. Second, the rise in the deficit in the early 1980s stimulated aggregate demand, a development that, on the one hand, may have encouraged more investment in productive capacity and, on the other, may have discouraged investment by putting additional upward pressures on interest rates. Third, persistently large structural budget deficits probably have contributed to expectations of weak future performance for the economy, further dampening the investment climate.

The long-run effects of the budget deficit on capital formation and potential output can be quantified using a broad framework that combines major determinants of economic growth—saving and capital formation, labor force growth, and technological advance—with necessary linkages to the inflow of foreign saving and the net external debt position. In a recent study, Harris and Steindel (1991) used this “neoclassical growth” framework to examine the impact of the decline in overall saving on potential GNP. Here we apply this model to the decline in federal government saving alone, comparing how the economy actually fared in the 1980s with how it would have fared had the federal deficit remained at its 1961-80 average as a share of GNP.

The results are striking. In the 1980s the deficit as a share of GNP averaged 2½ percentage points higher than in the 1961-80 period. This increase in the deficit lowered national saving and investment, a drop that was only partially offset by increased foreign capital inflows. Overall, the deficits cost the nation about 7 percent of its capital stock and 2½ to 3½ percent of its potential output by 1990. By the end of the century, if the deficit remains at its late 1980s share of GNP, the losses will grow to 10 to 11 percent for the capital stock and 4 to 5½ percent for output, *ceteris paribus*. (Further details of these simulations are provided in Appendix A.)

The Harris-Steindel model also gives a rough estimate of how much of the rise in the net external debt is attributable to the increasing federal deficit. As noted earlier, it is difficult to quantify precisely the link

³See Barro (1974) For a wide ranging review of issues and evidence on debt neutrality, see Haliassos and Tobin (1991).

⁴See Englander and Steindel (1989) for a detailed recent analysis of trends in capital formation

between domestic saving and foreign capital flows. The Harris-Steindel model estimates the link using two simplifying assumptions first, that the drop in domestic saving directly or indirectly caused foreign capital inflows to increase, replacing one-third of the lost saving, and second, that changes in government saving have the same impact on foreign capital flows as changes in private saving. The results suggest that the increased federal deficit is responsible for more than one-third of the 17 percentage point rise in external debt as a share of GNP over the last decade (and an equal portion of the corresponding 0.7 percent of GNP deterioration in net investment income)

By making somewhat different, but equally plausible, assumptions about certain key parameters, one can show that the effects of the budget deficit on the capital stock, potential output, and external debt may be smaller or larger than the Harris-Steindel model suggests. In particular, using the 1971-80 deficit as the baseline reduces the estimated cost of the 1980s deficits by a third. Furthermore, since the relationship between foreign capital inflow and national saving is not as tight as assumed here, the first set of calculations may overstate the effects of the deficit on external debt. Despite the lack of precision in such estimates, the main point is not controversial. federal budget deficits in the 1980s have had substantial adverse effects on the long-run performance of the economy

Summary. deficits and potential output

Overall, the federal deficit appears to have been responsible, on a national income accounts basis, for 55 to 70 percent of the decline in net national saving relative to GNP in the 1980s. Contrary to the Ricardian Equivalence doctrine, private saving has not risen to offset this decline in government saving. Furthermore, while foreign saving inflows have increased, replacing some of the lost domestic saving, these inflows add to the nation's external debt and increase the debt service burden of future generations. Estimates from the Harris-Steindel growth model suggest that the federal deficits of the 1980s have already cost the nation about 7 percent of its capital stock and roughly 3 percent of its potential output. If the current level of deficits persists, these losses could almost double by the end of the century.

Expenditure shifts and aggregate supply

This section examines whether the major shifts in the pattern of public sector expenditures over the last decade have reinforced or offset the implications of the budget deficit for long-run performance of the economy. We begin by describing the recent trends in broad categories of federal expenditures. We then look more closely at public spending in four important areas—transfers, capital formation, research and development, and education—and their implications for economic growth.

Table 4

Government Expenditures

Percent of GNP

| | Federal Government Expenditures | | | | | | | | |
|---------------------------|---------------------------------|-------------------|-----------------------|------------------------------|---|------------|-------------------------------|--|--|
| | Total | Defense Purchases | Non-defense Purchases | Net Interest Payment on Debt | Grants-in-Aid to State and Local Government | All Other† | Total Government Expenditures | Federal Entitlements and Other Mandatory Spending‡ | Federal Nondefense Discretionary Spending§ |
| Ten-Year Averages | | | | | | | | | |
| 1961-70 | 19.2 | 8.3 | 2.4 | 1.2 | 1.8 | 5.6 | 28.2 | 6.0 | 4.4 |
| 1971-80 | 21.1 | 5.5 | 2.4 | 1.5 | 3.2 | 8.6 | 30.8 | 9.8 | 4.9 |
| 1981-90 | 23.4 | 6.1 | 2.1 | 2.9 | 2.5 | 9.9 | 33.0 | 11.0 | 4.0 |
| Five-Year Averages | | | | | | | | | |
| 1971-75 | 20.8 | 6.0 | 2.4 | 1.3 | 3.0 | 8.1 | 30.9 | 8.9 | 4.6 |
| 1976-80 | 21.4 | 5.0 | 2.4 | 1.6 | 3.3 | 9.1 | 30.7 | 10.7 | 5.1 |
| 1981-85 | 23.8 | 6.1 | 2.2 | 2.8 | 2.6 | 10.1 | 32.9 | 11.5 | 4.4 |
| 1986-90 | 23.1 | 6.1 | 2.0 | 3.1 | 2.3 | 9.6 | 33.0 | 10.4 | 3.7 |

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

†Includes subsidies net of current surplus of government enterprises, as well as all other federal transfers to private sector.

‡Calculated on a fiscal year basis. Data for 1961 are not included.

§Includes essentially all nondefense purchases and federal grants-in-aid.

Federal government expenditures averaged 23½ percent of GNP over 1981-90, up from about 21 percent in the 1970s (Table 4). By contrast, the combined spending of state and local governments showed virtually no change over that period. Substantially higher interest payments on the rising public debt and increased spending on defense and government transfers to the private sector more than account for the rise in federal government outlays. Offsetting about one-quarter of the overall rise in these spending categories were significant declines in federal nondefense purchases and federal grants-in-aid to state and local governments. In other words, all of the decline occurred in nondefense discretionary spending of the federal government.

Some of these changes in the composition of spending may have significant consequences for the supply side of the economy. In particular, spending on transfer programs such as social security and unemployment benefits bears on labor supply decisions, while outlays for public capital, research and development, and education are important determinants of private sector productivity. By contrast, defense spending probably has limited implications for long-run growth beyond its impact on the deficit. Similarly, interest payments

should be viewed as a legacy of past budget deficits and therefore do not warrant separate treatment. With these exceptions in mind, we now turn to the key non-defense expenditure categories.

Government transfers to the private sector

Direct federal government transfers to the private sector increased to an average level of nearly 10 percent of GNP over 1981-90, compared with about 8½ percent of GNP over 1971-80 (Table 5). Federal transfers rose sharply in the early 1980s, reflecting to a considerable extent the effects of the 1980 and 1982 recessions, and dropped to an average of 9½ percent of GNP over 1986-90. State and local government transfers—the bulk of which are funded through federal grants-in-aid to state and local governments—showed only a small gain in the 1980s. The rise in government transfers occurred without a significant concomitant change in the ratio of non-working-age to working-age population (the so-called dependency ratio) and was largely driven by increases in Social Security and medicare benefits. Government spending on welfare programs, which are means-tested, showed no significant change in the 1980s relative to the second half of the 1970s.

The substantial rise in government transfers is likely

Table 5

Government Transfers to Private Sector

Percent of GNP

| | Total Government† | Federal | | | | | State and Local† | Federal Grants-in-Aid to State and Local Government | | Federal Welfare Programs‡ |
|---------------------------|-------------------|---------|-----------------|------------------------------|----------|------------------------|------------------|---|----------|---------------------------|
| | | Total‡ | Social Security | Federal Employee Retirement§ | Medicare | Unemployment Insurance | | Total¶ | Medicaid | |
| Ten-Year Averages | | | | | | | | | | |
| 1961-70 | 6.7 | 5.2 | 2.6 | 0.6 | 0.5†† | 0.4 | 1.4 | 1.8 | 0.2†† | 0.6 |
| 1971-80 | 10.7 | 8.4 | 3.9 | 1.0 | 1.0 | 0.6 | 2.3 | 3.2 | 0.5 | 1.5 |
| 1981-90 | 12.3 | 9.7 | 4.5 | 1.2 | 1.7 | 0.4 | 2.6 | 2.5 | 0.6 | 1.7 |
| Five-Year Averages | | | | | | | | | | |
| 1971-75 | 10.1 | 7.8 | 3.7 | 0.9 | 0.8 | 0.6 | 2.3 | 3.0 | 0.4 | 1.4 |
| 1976-80 | 11.3 | 8.9 | 4.2 | 1.1 | 1.1 | 0.6 | 2.4 | 3.3 | 0.5 | 1.7 |
| 1981-85 | 12.4 | 10.0 | 4.6 | 1.2 | 1.6 | 0.6 | 2.5 | 2.6 | 0.6 | 1.7 |
| 1986-90 | 12.2 | 9.5 | 4.4 | 1.1 | 1.8 | 0.3 | 2.7 | 2.3 | 0.7 | 1.7 |

Note: Data exclude net interest payments on debt. Components may not add to totals because of rounding.

†Includes subsidies

‡Includes subsidies but excludes federal grants-in-aid to state and local governments.

§Includes railroad retirement.

¶Includes a) three programs—food stamps, supplemental security income, and earned income credit—directly funded and implemented by the federal government and b) spending on Medicaid and "welfare and social services" funded through federal grants-in-aid to state and local governments

††Based on 1966-70 data.

to have affected labor supply, saving and investment, and the allocation of resources within the public sector. The labor supply effects of government transfers result primarily from Social Security and unemployment insurance benefits. Retirement payments to federal workers could also affect the labor supply, but these payments have shown little change since the mid-1970s

Social Security coverage increased dramatically in the early 1970s. Benefits were increased sharply in real terms, indexed to inflation, and extended to a broader population. The Social Security reform of 1983 slowed benefit growth by imposing a tax on the benefits of high-income retirees and by phasing in an increase in the retirement age from 65 to 67. Nevertheless, as the elderly proportion of the population expanded in the 1980s, Social Security outlays surged. Along with more generous private pensions, this development probably encouraged earlier retirements, lowering the labor supply

Empirical studies confirm that more generous Social Security outlays have had adverse effects on labor supply, although the magnitude of the response is in doubt (see, for example, Burkhauser and Quinn 1983). Indeed, as Table 6 indicates, recent trends in labor force participation rates for older workers do suggest a negative impact on the labor force. Participation rates for older men have declined steadily since the late 1960s. Among women, participation rates have risen rapidly for all age groups except women near retirement age.

Some of the adverse effects of higher Social Security benefits on labor supply were probably offset by lower unemployment insurance benefits in the 1980s. Both theoretical and empirical studies have demonstrated a significant negative link between unemployment insurance and work incentives or labor supply (see Hamermesh 1982 and Hum 1980). Perhaps influenced in part by these studies, legislation during the 1980s reduced unemployment insurance benefits and tightened eligibility requirements (for details, see Moorthy 1990). As a result, in 1990, 44 percent of unemployed workers received benefits, down from 53 percent in 1980 and 69

Table 6

Labor Force Participation Rates

Percent, Three-Year Averages

| | Men | | | Women | | |
|---------|---------|-------|-----------|-------|-------|-----------|
| | 16-54 | 55-64 | 65 & over | 16-54 | 55-64 | 65 & over |
| | 1968-70 | 88.3 | 83.5 | 27.1 | 49.3 | 42.9 |
| 1978-80 | 88.2 | 72.7 | 19.8 | 62.2 | 41.5 | 8.2 |
| 1988-90 | 88.5 | 67.3 | 16.5 | 71.2 | 44.6 | 8.3 |

percent in 1975, the peak year for benefits. These changes have lowered overall unemployment insurance payments as a percentage of GNP, thereby boosting labor supply.

Increased transfers in the 1980s may also have affected household saving behavior. Empirical studies suggest that Social Security transfers had a modest depressing effect on private savings (for retirement and precautionary purposes), although the evidence does not appear to be robust (see, for example, Evans 1983, Organization for Economic Cooperation and Development 1985, and Smith 1990). More generally, the propensity to save out of transfers is lower than out of other income, so the change in the mix of income may have put downward pressure on private saving. Overall, the adverse effects of higher transfer payments on private saving, and therefore on investment, are likely to have been small in light of the relatively weak link between Social Security benefits and household saving

The sharp rise in government transfers in the 1980s may also have caused some "crowding out" of other government spending, including public investment. For example, one apparent victim of the federal budget squeeze has been grants-in-aid to state and local governments. In some ways this loss may encourage growth because it helps contain the expansion of government expenditures and because the grant system often causes inefficient spending choices (Organization for Economic Cooperation and Development 1990, pp 95-97). Its main effect, however, has been to hurt potential output: the decline in grants has been concen-

Table 7

Real Nonmilitary, Nonresidential Public Investment and Capital Stock

Percent of GNP

| | Gross Public Investment | Net Capital Stock | | Total Private and Public |
|---------------------------|-------------------------|---------------------|-----|--------------------------|
| | | Public [†] | | |
| Ten-Year Averages | | | | |
| 1961-70 | 3.7 | 49.3 | 4.6 | 131.2 |
| 1971-80 | 2.5 | 49.5 | 1.9 | 140.6 |
| 1981-90 | 2.1 | 44.8 | 1.4 | 143.4 |
| Five-Year Averages | | | | |
| 1971-75 | 2.8 | 50.9 | 2.4 | 140.7 |
| 1976-80 | 2.2 | 48.0 | 1.4 | 140.5 |
| 1981-85 | 2.0 | 46.7 | 1.1 | 146.4 |
| 1986-90 | 2.2 | 43.0 | 1.8 | 140.3 |

[†]Figures in the right hand column under this heading are averages of annual percent changes. They include the changes in both the first year and the last year in each period

trated in "investment" activities such as training, employment, and regional development, whereas the share of grants earmarked for "consumption" activities such as health and income security has increased. This change in the allocation of resources in the public sector has probably lowered economic growth, although it is difficult to measure the extent of the lost output.

Public capital formation

Nonmilitary government investment as a share of GNP has declined substantially since the mid-1970s (Table 7). The bulk of the slowdown reflects lower investments by state and local governments. Nonmilitary capital stock averaged 43 percent of GNP in the second half of the 1980s, down from about 49 percent over 1971-80. The rate of capital formation declined to 2 percent over 1981-90 from 2½ percent over the preceding decade. The decline in public capital formation is broadly spread across various components of public infrastructure—highways and streets, education buildings, water supply, sewer and transit systems, airports and public electric and gas utilities—which together account for more than two-thirds of nonmilitary public capital stock.

Although there is little doubt that the slowdown in public investment has adversely affected potential output, the importance of public capital stock to output has been the subject of some controversy in recent years.⁵ This disagreement is driven by differing views of the return to public capital relative to private capital and associated estimates of the elasticity of the annual increase in private output with respect to public capital, estimates that range from a low of 8 percent to a high of 40 percent. The upper end of the elasticity range implies that the marginal product of public capital is several times that of private capital. This assessment is clearly implausible. The lower end of the range implies that the marginal return on public capital is the same as that of private capital.

If we choose a 10 percent estimate for the output elasticity of public capital and the average level of the 1970s as the benchmark, we find that the decline in public capital formation in the 1980s has lowered annual output growth by 0.05 percent. In other words, annual output would have grown that much faster if public capital stock had continued to increase at the higher rate of the 1970s. The implied cumulative loss of output for the whole decade is about ½ percent and will increase over time. Of course, with a higher output elasticity of public capital, the loss of output would be greater; for example, a 20 percent estimate for the elasticity would double the implied output loss for the

⁵For a discussion of the relevant issues, see Munnell (1990), Hulten (1990), and Rubin (1991).

1980s. Moreover, these estimates do not take into account the "accelerator" effects of lower output on saving, capital formation, and eventually future potential output. In any event, these estimates indicate that the slowdown in public capital formation in the 1980s has had at least a modest adverse effect on the long-run performance of the economy.

Government expenditures on research and development

Potential output may also have been hurt by the slowdown in federal nondefense expenditures on research and development (R&D) during the 1980s. R&D expenditures affect potential output by improving technology and thereby increasing total factor productivity, that is, growth in output not directly explained by capital or labor inputs. Federal spending on nondefense R&D declined to 0.4 percent of GNP over 1986-90 from 0.6 percent of GNP over 1976-80 (Table 8). The decline was fully offset, however, by increased federal spending on defense R&D, which climbed from 0.5 percent of GNP to 0.8 percent of GNP over that period.

Increased federal expenditures on defense R&D have probably offset some of the adverse effect of lower nondefense R&D spending on economic growth. Defense R&D activities have been managed with a view to exploiting commercial opportunities. For example, major advances in civil aviation, medical technology, and weather satellites originated from defense-sponsored R&D. Even so, the private sector benefits of nondefense R&D are probably higher than those of

Table 8
Federal Outlays for Research and Development
Percent of GNP

| | Total | Defense | Non-defense | Total Private and Public R&D Expenditures [†] |
|---------------------------|-------|---------|-------------|--|
| Ten-Year Averages | | | | |
| 1961-70 | 1.9 | 1.1 | 0.8 | 2.8 |
| 1971-80 | 1.2 | 0.6 | 0.6 | 2.2 |
| 1981-90 | 1.2 | 0.7 | 0.4 | 2.7 |
| Five-Year Averages | | | | |
| 1971-75 | 1.3 | 0.7 | 0.6 | 2.3 |
| 1976-80 | 1.1 | 0.5 | 0.6 | 2.2 |
| 1981-85 | 1.1 | 0.7 | 0.5 | 2.6 |
| 1986-90 | 1.2 | 0.8 | 0.4 | 2.7 |

Note: Outlays are measured on a fiscal year basis. Components may not add to totals because of rounding.

[†]National Science Foundation estimates on a calendar year basis.

defense R&D (see Organization for Economic Cooperation and Development 1990, pp 89-90) On a net basis, therefore, total federal R&D spending—which has remained unchanged as a share of GNP since the mid-1970s—probably made a smaller contribution to economic growth in the 1980s than in the earlier period⁶

Education expenditures

Government spending on education-related activities affects the quality of labor and therefore plays a major role in the growth of potential output Starting from relatively high base levels of real education expenditures, however, marginal changes in government spending on education may not be closely related to changes in the quality of labor or in the underlying educational performance if nonfinancial factors have large effects on education

Overall government education expenditures declined to 5.5 percent of GNP over 1981-90 from 6.1 percent of GNP over 1971-80 (Table 9) State and local governments carry the main responsibility for education,

⁶Tax law changes also affected private R&D expenditures in the 1980s The 1981 tax law created incentives for R&D including a "research and experimental tax credit" These incentives were eliminated in the 1986 tax reform Hines (1991) argues that the 1986 reform caused a \$1.4 to \$2.2 billion drop in R&D expenditures

Table 9

Government Education and Labor Training Expenditures

| | Expenditures as Percent of GNP | | | Real per Capita Expenditures for Population under 30 (1987 Dollars) |
|---------------------------|--------------------------------|----------------------|------------------------------|---|
| | Total ¹ | Federal ² | State and Local ³ | |
| Ten-Year Averages | | | | |
| 1961-70 | 4.8 | 0.4 | 4.4 | 1,443 |
| 1971-80 | 6.1 | 0.8 | 5.3 | 2,094 |
| 1981-90 | 5.5 | 0.5 | 5.0 | 2,162 |
| Five-Year Averages | | | | |
| 1971-75 | 6.1 | 0.7 | 5.4 | 2,006 |
| 1976-80 | 6.0 | 0.9 | 5.2 | 2,183 |
| 1981-85 | 5.5 | 0.6 | 4.9 | 2,064 |
| 1986-90 | 5.5 | 0.5 | 5.0 | 2,260 |

Note: Components may not add to totals because of rounding

¹Total government and private spending on education is, of course, larger, in recent years, private educational expenditures have been estimated to be in the range of 1.5 to 2 percent of GNP

²Labor training component has usually accounted for less than 30 percent of federal expenditures

³Labor training component has usually accounted for only about 2 percent or less of state and local government expenditures

accounting for more than four-fifths of these expenditures Despite the decline in the GNP share of government education expenditures, on a real per capita basis for population under thirty years of age, those expenditures actually increased in the 1980s as compared with the earlier period It seems likely, therefore, that the modest decline in government spending on education as a share of GNP in the 1980s has had only a small impact on potential output growth

This impression is strongly confirmed by looking at real public school expenditures per pupil and educational achievement over the postwar period As Table 10 demonstrates, real total spending per student has risen throughout the postwar period and has nearly tripled over the past three decades More important perhaps, increased spending seems to have accomplished what advocates of higher spending frequently seek: lower pupil-teacher ratios, smaller class sizes, and better educated and more experienced teachers (see Chubb and Hanushek 1990) Yet educational performance has stagnated or possibly dropped For example, overall achievement at the high school level declined through much of the 1970s, recovered some of the lost ground in the late 1970s and 1980s, and today appears to be, at most, no better than it was two decades ago (Council of Economic Advisers 1990, chap 5, and Chubb and Hanushek 1990) These findings suggest that increases in educational spending have had only a small impact on educational achievements and have not succeeded in overcoming the broader social problems students bring to school

Summary expenditure shifts and potential output

Shifts in the pattern of several important components of government expenditures are likely to have depressed potential output, but the overall effect appears to be relatively modest, perhaps on the order of 1 percent for the 1981-90 period The decline in the rate of public capital formation in the 1980s seems to have brought potential output about 1/2 percent below what it would have been if public capital stock had continued to advance at the higher rate of the 1970s, this loss of

Table 10

Real Public School Expenditures per Pupil

1988 Dollars

| | 1960 | 1970 | 1980 | 1988 |
|-----------------------------------|-------|-------|-------|-------|
| Current expenditures ¹ | 1,499 | 2,488 | 3,202 | 4,209 |
| Total expenditures | 1,889 | 2,912 | 3,592 | 4,626 |

Source: Chubb and Hanushek (1990)

¹Excludes capital outlays and interest on debt

output will increase over time. On the whole, increased transfer payments to the private sector also worked to reduce the supply of output, although a part of the adverse effect of higher Social Security payments on labor supply was probably offset by the favorable effect of lower unemployment insurance benefits. Government spending on R&D may have made a smaller contribution to output in the 1980s than in the earlier period, but the difference does not appear to be significant. Finally, the decline in public education expenditures as a share of GNP is likely to have had small adverse consequences for output growth.

The supply-side implications of tax policy

As noted in the introduction, supply-side economics had an important influence on tax policy in the 1980s, especially in the early part of the decade. In particular, supply-siders argued that reducing marginal tax rates would encourage economic growth by creating incentives for reallocating resources. Because of the stimulus to output, many supply-siders believed that the tax cuts would pay for themselves—that is, the rise in the tax base resulting from lower rates would be sufficient to prevent tax revenue losses.

Although most economists disagreed with the view that the tax cuts would pay for themselves, they shared concerns about the tax distortions and adverse incentives created by the then existing tax structure. Some economists also had misgivings about the fairness and complexity of the tax structure. After the early 1980s, narrower supply-side views became less fashionable, but uneasiness about the incentives and other effects of the tax system continued.

Tax trends in the 1960s and 1970s contributed to distortions and perverse incentives, setting the stage for the 1980s "revolution." In the late 1960s and 1970s high inflation combined with an unindexed tax system steadily worsened the incentive effects of the tax structure. As Table 11 suggests, bracket creep pushed the

marginal personal tax rate for the median family up from 17 percent in 1965 to 24 percent in 1980. Over the same period the average tax rate remained roughly constant at about 11 percent because of the continual introduction of new credits or deductions.

Inflation had other pernicious effects on the tax structure. Even in noninflationary times, savers and investors were often taxed twice on the same income. Inflation added to this penalty for thrift. For example, in 1965 the median tax payer earned a 1.8 percent real after-tax return on his or her one-year Treasury bond, by 1980, with higher inflation and marginal tax rates, that same tax payer "earned" a negative 4.3 percent real after-tax return.⁷ Inflation also encouraged a shift in investment away from business and into home building. Neither the implicit rent nor the capital gains from home ownership were taxed, and as a result, increases in interest rates and inflation raised the value of owner-occupied housing while lowering the value of business fixed investment.⁸

Tax changes in the 1980s were designed to reverse some of these trends. The cornerstones were the Economic Recovery Tax Act (ERTA) of 1981 and the Tax Reform Act (TRA) of 1986. ERTA rolled back marginal personal tax rates and offered new tax breaks to savers and investors. TRA lowered personal tax rates further, broadened the tax base, and attempted to "level the playing field" by taking away a variety of tax breaks. The years between these landmark bills saw several smaller revisions to the tax code that together had important supply-side implications. (For details on the tax laws,

⁷The example uses the tax rates in Table 11 and the actual consumer price index inflation rate (1.6 for 1965 and 13.5 percent for 1980) and bond yields (4.2 for 1965 and 12.0 percent for 1980).

⁸According to estimates by de Leeuw and Ozanne (1981), a permanent 12 percent increase in both interest rates and inflation would raise the value of owner-occupied housing by 22 percent while lowering the value of business fixed investment by 22 percent.

Table 11

Key Tax Rates

| | Marginal Personal Rate | | | Social Security ¹ | Top Bracket | | |
|------|------------------------|--------|------------------|------------------------------|-------------|-----------------|-----------|
| | One-Half Median | Median | Two times Median | | Personal | Capital Gains | Corporate |
| 1965 | 14 | 17 | 22 | 7.2 | 70 | 30 ² | 48 |
| 1980 | 18 | 24 | 43 | 12.3 | 70 | 28 | 46 |
| 1985 | 14 | 22 | 38 | 14.1 | 50 | 20 | 46 |
| 1988 | 15 | 15 | 28 | 15.3 | 33 | 28 | 34 |

¹Combined employee-employer contribution. The "1988" figure is actually the most recent 1990 rate.

²1970 rate.

see Appendix B.)

The remainder of this section evaluates the empirical evidence on the supply-side effects of tax changes in the 1980s. Focusing on labor supply, saving, and investment, we review both the impressionistic evidence and the more sophisticated results from the literature. Taken as a whole, the evidence suggests that tax policy changes in the 1980s had only a modestly favorable net impact on the supply-side performance of the U.S. economy.

Labor supply

ERTA, TRA, and the legislation in the intervening years significantly influenced the after-tax return to labor. ERTA lowered marginal personal tax rates over a period of three years. The top rate was immediately cut from 70 percent to 50 percent, and other rates were reduced in three stages to produce a cumulative decline of 23 percent by 1984. Starting in 1985, the rate schedule was indexed to the price level, precluding any subsequent bracket creep. Other provisions that increased the incentive to work included a reduction in the "marriage tax" and lower taxes on various kinds of saving.

The next several tax bills whittled away some of the tax advantages for labor supply offered in ERTA. The most important of these, the 1983 amendment to the Social Security Act, broadened the base of the Social Security payroll tax to include more workers and raised the tax rate. The combined employer-employee rate was raised from 13.4 percent in 1983 to 15.3 percent in 1990.

TRA continued the personal tax rate cuts started under ERTA. By 1988 the law had swept away the old structure of fourteen tax brackets ranging from 11 percent to 50 percent and substituted two brackets of 15 percent and 28 percent.⁹ At the same time, the tax base

⁹Because of the phasing out of personal exemptions, upper-middle income earners faced a marginal rate of 33 percent. Under the 1990 Budget Accord this tax rate "bubble" was reduced to 31 percent.

was broadened by restricting individual retirement accounts and disallowing a variety of other deductions. The law partly offset this base broadening by roughly doubling the personal exemption and the standard deduction. Overall, TRA not only cut marginal tax rates substantially, but also was designed to shift a significant part of the tax burden from the personal to the corporate sector.

If supply-side economics has validity, these dramatic cuts in marginal tax rates should have had a significant impact on labor supply, inducing workers to substitute work for leisure. Most important, the tax cuts should have increased the hours and participation rates of married women and secondary earners, who presumably have a relatively flexible work choice. The cuts should also have induced some workers to move into higher paying, more demanding work or to invest more in their human capital. Yet even in theory, the labor response would not be entirely predictable because it would depend, among other things, on the relative strength of the substitution and income effects. On the one hand, lower taxes may induce greater willingness to work because of the higher after-tax return to work. On the other hand, lower taxes mean less work is needed to earn the same after-tax income. The labor supply response also depends on the flexibility of work arrangements and the way the tax cut is "financed."¹⁰

Impressionistic evidence does not suggest a dramatic labor supply response to the tax cuts. As Table 12

¹⁰For example, if the tax cut is accompanied by an equal cut in consumption-like government expenditure, tax payers may feel that their "income" or command over goods and services is unchanged. In this case, a cut in marginal tax rates will almost surely increase labor supply through the substitution effect. But if the tax cut is financed through base broadening to include fringe benefits that are at least implicitly linked to basic wages, it may not have a significant effect on the marginal return to work.

Table 12

Key Labor Supply Statistics

| | Participation Rate | | Multiple Job Holders as a Percentage of Employment | Part-Time Workers [‡] as a Percentage of Employment | Average Work Week |
|------|--------------------|--------------------------------|--|--|-------------------|
| | Married Women | Secondary Earners [†] | | | |
| 1969 | 41.5 [§] | 55.3 | 3.6 | 0.8 | 37.7 |
| 1979 | 49.3 | 63.4 | 3.2 | 1.6 | 35.7 |
| 1985 | 54.2 | 65.9 | 3.9 | 2.7 | 34.9 |
| 1989 | 56.5 | 68.5 | 4.5 | 2.1 | 34.6 |

[†]All workers except prime-age males

[‡]Part-time because could not find full-time work

[§]Because of a definitional change in the series, 1972 data are used

shows, participation rates for married women—the group that is probably most sensitive to marginal tax rates—increased more in the rising tax years of the 1970s than in the falling tax years of the 1980s.¹¹ Other labor force indicators give only weak support for the supply-side argument. The portion of people holding second jobs—another group sensitive to tax cuts—did rise sharply in the 1980s. As the fourth column of Table 12 shows, however, a good portion of this increase in dual jobs may have been due to this population's difficulty in finding a single full-time job. Finally, in the 1980s the average work week continued to drop in line with its postwar trend, a further indication that no incentive-induced turnaround had occurred.

Estimates in the empirical literature support a somewhat larger labor supply response to the tax cuts. Perhaps the strongest results come from the 1987 Annual Report of the Council of Economic Advisers. Using a simulation model with assumed parameters, the Council estimated a 3.1 percent increase in the labor supply response to TRA alone. Evans and Kenward (1988) suggest, however, that the Council's model is quite sensitive to changes in parameters. Studies that use actual empirical estimates of the elasticity of labor supply find a smaller response. Hausman and Poterba's (1987) econometric estimates, which build on earlier work by Hausman, suggest that TRA raised the long-run labor supply by 1½ percent, with most of the increase explained by the higher participation rate of married women.¹² Their estimates suggest that ERTA's impact on labor supply was about half that of TRA.¹³ Even these estimates may be on the high side: in Bosworth's (1984) survey of the literature, most labor supply elasticity estimates are lower than Hausman's. Overall, empirical evidence suggests a labor supply response to ERTA and TRA combined that is greater than zero but probably less than 2 percent.

¹¹A closer look at the work hours of married women across income classes reinforces this impression. In the 1980s women in low income families (the bottom 20 percent for two-parent families with children) increased their work hours by 43 percent despite a 3 percent *fall* in their real hourly wages. By contrast, women in high income families (top 20 percent) worked only 25 percent more hours even as their real hourly wage soared 27 percent. It appears that economic necessity rather than the incentive effects of higher wage rates was the principal determinant of increasing work effort by women in the 1980s. For details see Joint Economic Committee (1992).

¹²The largest effect is for married women who work part time. These women have considerable discretion over whether to work or not, and under TRA they experienced, on average, a dramatic drop in their marginal tax rate from 22.5 percent to 15 percent.

¹³Not only were the marginal rate cuts greater under TRA, but because the law was designed to be revenue neutral, a large offsetting "income effect" from the tax cut was less likely.

Investment

ERTA was the high water mark of efforts to create tax incentives for investment in the United States. It extended the investment tax credit to more short-term assets, allowed firms to use the accelerated cost recovery system for depreciating capital, granted a more generous 175 percent declining balance for structures, and allowed "safe harbor leasing" so companies could take advantage of tax credits even if they had no taxable income. (See Appendix B for further details.)

The tax laws of the next several years first chipped away at the investment tax benefits of ERTA and then, with the passage of TRA in 1986, virtually turned back the clock to the pre-1981 level of tax incentives. The Tax Equity and Fiscal Responsibility Act of 1982 scaled back the benefits of the investment tax credit, canceled further planned accelerations in the depreciation schedule, and put some restrictions on safe harbor leasing. The Deficit Reduction Act of 1984 made the depreciation rules less favorable. Finally, in 1986 TRA attempted to "level the playing field" for investment by eliminating many of the special provisions created under ERTA and earlier legislation. Although TRA cut the maximum corporate tax rate from 46 percent to 34 percent by 1988, this measure was more than offset by the retroactive abolition of the investment tax credit and the elimination of the generous depreciation rules, especially for structures. Whereas TRA had tended to reinforce the labor supply incentives created under ERTA, it dramatically scaled back efforts to promote investment through special incentives.

Tax changes in the 1980s should have had several noticeable effects on aggregate investment. In particular, investment should have reached high levels both as a share of GNP and as a contributor to the recovery from the 1982 recession. Furthermore, since equipment investment first garnered many of the tax breaks introduced in ERTA and then lost them through subsequent legislation, equipment investment should have outpaced previous expansions until 1986 and then should gradually have fallen back to the levels it registered during previous expansions.

In fact, although some measures of business fixed investment were high as a share of GNP in the 1980s, the more important measures were quite low (Table 13). Because investment shifted into shorter lived assets with high rates of depreciation, gross investment was relatively high, especially when measured in real terms (reflecting the sharp drop in the relative price of computers). But gross investment measures exaggerate the extent of capital formation. As the right side of the table shows, net investment and therefore the growth in the capital stock were quite weak in the 1980s.

Chart 1 compares the recovery of equipment and

structures investment following the 1982 recession with two earlier long economic expansions. It shows (1) that investment did not always respond as expected to tax law changes in the 1980s and (2) that, if anything, tax law changes probably hurt investment in the 1982-90 expansion. Equipment investment recovered quickly from the deep 1981-82 recession, but before the passage of TRA, equipment spending had leveled off and fallen behind previous expansions. Surprisingly, after tax advantages for equipment were eliminated in 1986, equipment investment actually recovered from its mid-1980s doldrums. Structures investment languished following TRA. In fact, for the 1982-90 expansion as a whole, structures investment grew only about 10 percent, compared with 40 to 50 percent in previous expansions.

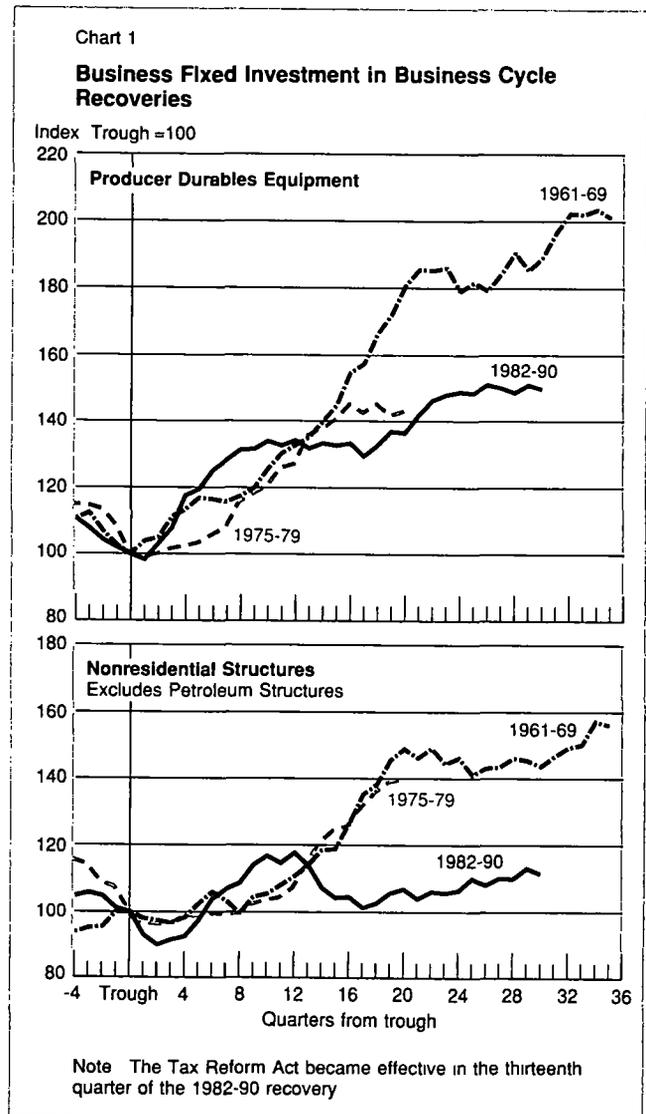
Of course, the broad trends in the aggregate data may reflect the offsetting impact of tax law changes and the impact of other variables on investment. Fortunately, much empirical work has been published on tax policy and investment. Most of the literature uses a relatively simple neoclassical framework with a "cost of capital" variable that takes into account tax credits, depreciation rules, costs of funds from various sources, and the corporate tax rate. In this framework, two aspects of investment behavior complicate the assessment of tax law changes. First, this sector is not only highly cyclical but has also been buffeted by dramatic structural shocks arising from new technology and changes in the composition of output. Second, econometric models generally do not fit the investment data well, particularly for structures, making it difficult to produce "statistically significant" results even when the coefficients are economically large.

A variety of studies in the mid-1980s found that tax policy probably played a small but significant role in the 1982-84 investment recovery. Surveys of the literature by Bosworth (1984) and Chirinko (1986) argue that although there is no clear consensus on the magnitude of tax effects on investment, most studies find that taxes mattered but were not nearly as important as output growth, interest rates, and inflation. (See, for example, Sahling and Akhtar 1985, Brayton and Clark 1985, and Meyer 1984.) In a representative study, Sahling and Akhtar argue that tax changes accounted for about one-fifth of the expansion in business fixed investment over 1982-84.

Table 13
Nonresidential Investment as a Share of National Product

| | Gross Investment | | Net Investment ¹ | | Depreciation | |
|---------------------------|------------------|------|-----------------------------|------|--------------|------|
| | Nominal | Real | Nominal | Real | Nominal | Real |
| Ten-Year Averages | | | | | | |
| 1961-70 | 10.0 | 9.6 | 3.9 | 3.6 | 6.4 | 6.3 |
| 1971-80 | 11.3 | 10.5 | 4.1 | 3.5 | 7.6 | 7.3 |
| 1981-90 | 11.8 | 11.4 | 3.2 | 3.0 | 9.0 | 8.7 |
| Five-Year Averages | | | | | | |
| 1971-75 | 10.7 | 10.2 | 3.9 | 3.5 | 7.1 | 7.0 |
| 1976-80 | 11.9 | 10.8 | 4.2 | 3.5 | 8.2 | 7.6 |
| 1981-85 | 12.6 | 11.5 | 3.7 | 3.3 | 9.3 | 8.6 |
| 1986-90 | 11.0 | 11.2 | 2.7 | 2.8 | 8.6 | 8.7 |

¹Percentage of net national product



Most research suggests that the 1981-82 tax stimulus to investment was reversed under TRA. The President's Council of Economic Advisers (1987) optimistically estimates that the law lowered the capital stock by only about 1/2 percent. Others estimate much larger losses of capital stock. Using a model similar to the Federal Reserve's MPS model, Prakken (1986) finds that TRA would lower the 1995 capital stock by almost 9 percent. Fazzari's (1987) middle-ground findings attribute about a 4 percent decline in the capital stock to TRA.

Several studies have attempted to assess the net impact of tax law changes between 1981 and 1986. As Table 14 shows, Corker et al (1989) find that the net impact of the tax changes was to raise the cost of capital, especially for equipment. These estimates of the cost of capital lead Corker and his colleagues to conclude that "in the long run, it seems likely that business fixed investment and the corporate capital stock could be lower than [they would have been] if none of these packages had been enacted" (p. 59).

Tax changes in the 1980s had other significant effects on capital formation that cannot easily be captured in cost of capital calculations. ERTA included strong incentives for tax shelters because of its favorable depreciation provisions, safe harbor leasing feature, and generous treatment of passive income losses. These tax incentives, along with relatively easy credit, were a major cause of the boom in apartment and office building and the sharp rise in vacancy rates in the mid-1980s. This process came to an abrupt halt when TRA put strong restrictions on tax shelters. To the extent that TRA diverted funds to capital with higher utilization rates, it had a positive impact on potential output. Thus, most conventional studies using the cost of capital approach have probably overstated both ERTA's favorable effects and TRA's adverse effects on potential output.

Table 14

The Real Cost of Capital
Percent

| | 1982 | 1985 | 1987 |
|------------------------------|------|------|------|
| Equipment | | | |
| Actual | 9.7 | 9.3 | 9.6 |
| Excluding tax policy changes | 10.6 | 10.0 | 8.3 |
| Difference | -0.9 | -0.7 | 1.3 |
| Structures | | | |
| Actual | 7.2 | 5.8 | 5.0 |
| Excluding tax policy changes | 8.5 | 6.9 | 4.5 |
| Difference | -1.3 | -1.1 | 0.5 |

Source: Corker et al (1989)

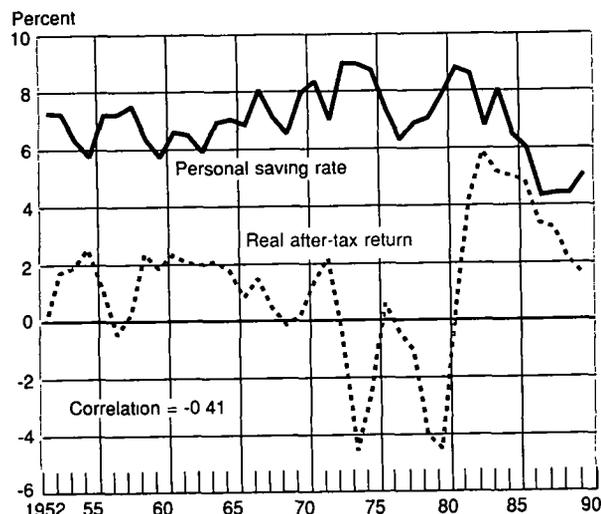
Saving

Tax law changes in the 1980s had significant effects on the after-tax return to saving. ERTA not only lowered marginal tax rates but broadened eligibility for individual retirement accounts (IRAs) and other retirement plans. TRA promoted saving by lowering tax rates further and eliminating the deduction for nonmortgage consumer interest, but it discouraged saving by restricting IRAs. Other tax law changes relevant to saving included the temporary cut in the maximum capital gains tax rate from 28 percent to 20 percent in the early 1980s, and the shift in the tax burden from the low-saving household sector to the high-saving corporate sector under TRA.

Impressionistic evidence does not suggest a strong saving response to changes in the after-tax rate of return. Until recently, the private saving rate in the United States was so stable that this empirical regularity became known as "Denison's law." As Chart 2 shows, there does not appear to be a systematic positive relationship between the after-tax real interest rate and the saving rate; in fact, the two variables are negatively correlated. During the early 1980s, saving rates fell despite a combination of very high real interest rates, cuts in marginal tax rates, and generous saving incentives. Blinder (1987) aptly points out that "titanic

Chart 2

The Savings Rate and Real After-Tax Returns



Note: The real after-tax return is $(1-t)r$, where r is the yield on AAA corporate bonds, t is the median income tax rate for a family of four, and p is the twelve-month percent change in the consumer price index excluding food and energy.

increases in rates of return during the 1980s failed to raise private saving. This suggests that the response of saving to the rate of return may not even be positive, much less large" (p. 638).

Most econometric studies find either very small effects of real interest rates on saving or no effect at all (see Smith's 1990 literature survey). Indeed, the estimated elasticity appears to be smaller in more recent studies that use data from the 1980s.

Evidence for a saving response to IRAs is more favorable. Clearly these tax-free accounts alter the composition of saving; the tougher question is how much they "borrow" from other forms of saving by causing shifts out of other assets and by increasing the federal budget deficit. The strongest support for IRAs comes from Venti and Wise (1987), who contend that about half of IRA savings is diverted from consumption. Carroll and Summers (1987) present corroborating evidence, arguing that much of the difference between U.S. and Canadian saving rates is due to more generous saving incentives in Canada. Other studies are less sanguine: Deaton (1987) questions Venti and Wise's conclusions, and Horioka (1986) argues that differences in tax incentives account for little of the difference between Japanese and U.S. saving rates. Furthermore, it is difficult to reconcile the micro evidence on IRAs with one macroeconomic fact: the personal saving rate fell almost continuously during the 1980s, both during years of generous IRA provisions (1982-86) and when IRAs were curtailed. If tax policy encouraged saving in the mid-1980s, the effects must have been quite small relative to other determinants of saving.

Summary: tax policy and potential output

For the 1980s as a whole, tax changes had little net impact on the incentive to save and invest. Tax incentives for investment granted under ERTA were reversed in subsequent legislation. The net impact on capital stock and hence on output growth was probably close to zero. Similarly, IRAs and other tax incentives for saving probably provided only a temporary boost to private saving in the early 1980s. It is hard to argue, moreover, that any such boost was substantial since the personal saving rate fell throughout the period. In any event, tax incentive effects on saving appear to have been too small to have had significant consequences for capital stock and the supply of output.

By contrast, reductions in personal tax rates in the 1980s appear to have made a significant, though modest, contribution to labor supply and potential output. At one extreme, optimistic econometric estimates suggest about a 3 percent labor supply response, mainly in the form of higher participation rates. At the other extreme, the raw data seem to suggest very small effects. In

particular, the labor force participation rates of those who should have been most affected—married women, "moonlighters," and secondary workers in general—have not shown a noticeable response to tax changes. Overall, our best guess is that the tax rate reductions during the 1980s most likely increased labor supply by about 2 percent. Since labor represents a two-thirds share of output, the implied contribution of increased labor supply to potential GNP would appear to have been less than 1½ percent.

Conclusion

On the whole, developments in U.S. fiscal policy during the 1980s were unfavorable for the long-run performance of the economy. It appears that large and persistent federal budget deficits have already lowered the level of potential output by roughly 2½ to 3½ percent and, assuming no significant change in fiscal stance, the negative impact will continue to build up over time. Budget deficits have also made a significant contribution to the deterioration in the nation's net external debt position.

Shifts in public expenditures in the 1980s, especially through the reduced share of capital spending and the increased share of transfer expenditures, have put further downward pressures on capital stock and potential output. Thus far, however, adverse effects of expenditure shifts on output appear to have been relatively modest.

Changes in tax policy in the 1980s appear to have made no significant net contribution to capital formation for the decade as a whole. Tax breaks for investment were introduced in the early 1980s but subsequently taken away, leaving a more level playing field with less special incentives for investment. In contrast, tax policy initiatives have spurred labor supply and work effort, although it is very difficult to measure these benefits. Our reading of the available impressionistic and econometric evidence suggests that the favorable effects of reductions in marginal tax rates on potential output appear to have been smaller than the adverse consequences of large and persistent budget deficits.

In the absence of new legislation, a major reversal of the federal deficit trend in the next year or two seems unlikely. Indeed, the federal deficit has mushroomed and, on a national income accounts basis, is expected to exceed 5 percent as a share of GNP in the current fiscal year.¹⁴ Fortunately, a significant part of the increase reflects the temporary effect of the recession.

¹⁴This deficit estimate excludes the deposit insurance costs of bailing out or closing insolvent thrift institutions and commercial banks. These outlays represent a transfer from one sector to another and do not affect national saving.

With a sustained recovery, the Congressional Budget Office projects that the deficit will fall to about 3 percent of GNP by 1995. This improvement would reduce the deficit to below its 1980s average, although consider-

able further efforts would be required to bring the budget back into balance. The challenge to policy makers will be to reduce the deficit without undoing the positive supply-side developments of the 1980s.

Appendix A: Deficit Impacts on Potential Output

The estimated effects of the deficit on potential output are based on simulations of a detailed neoclassical growth model. The model links the three key determinants of growth—saving and investment, labor force growth, and technological advance—to economic growth and the external debt position. We use two variations of the model to accommodate differing views about the interaction between investment and technological change: a “traditional” model that treats technology as independent of investment, and a “learning-by-doing” model that assumes that new investment encourages technological innovations. In both versions of the model, an increase in the federal deficit lowers net national saving and investment, although some of the decline in

investment is offset by increased foreign capital inflows. With slower growth in the capital stock and higher debt service to foreigners, U.S. income growth falls. In the learning-by-doing model, the slowdown in capital formation also discourages technological change, further weakening income growth. Details of the model are presented in the appendix to Harris and Steindel (1991).

The table shows the important role of the “baseline” assumption in estimating the cost of the budget deficits in the 1980s. The baseline is the standard of comparison for the actual deficit: it shows what the deficit would have been had fiscal policy remained unchanged in the 1980s. The simplest baseline is a zero deficit, implying that fiscal policy in the 1980s is blamed for the entire deficit during that period. Using the traditional model, we find that the deficit accounts for a 3.8 percent drop in potential by 1990; using the learning-by-doing model, we find that the deficit is responsible for a 5.0 percent loss of potential. But these figures probably exaggerate the cost of fiscal policy in the 1980s. The budget was in deficit even at the peak of the business cycle in 1979, and balancing the budget for the decade would have required major new fiscal initiatives. On the other hand, using the 1970s as the baseline appears to understate the cost of fiscal policy in the eighties because the average deficit for that decade was quite high. A reasonable compromise, adopted in the text, is to use the long historical average from 1961 to 1980 as the baseline.

Sensitivity of Output Loss Estimate to Baseline Deficit Assumption

Percent Deviation from Baseline

| Baseline Deficit | Deficit | Potential Output in 1990 | |
|------------------|---------|--------------------------|-------------------------|
| | | Traditional Model | Learning-by-Doing Model |
| Zero | 3.6 | -3.8 | -5.0 |
| 1961-80 Average | 2.5 | -2.7 | -3.5 |
| 1971-80 Average | 1.8 | -1.8 | -2.3 |

Appendix B: Main Features of Tax Law Changes in the 1980s

The Economic Recovery Tax Act (ERTA), 1981

Personal taxes

- Cut marginal personal tax rates in increments of 5 percent, 10 percent, and 10 percent, producing a total reduction of 23 percent by 1984. Immediately cut the top rate from 70 percent to 50 percent.
- Indexed the rate schedule, the zero bracket amount, and the personal exemption to the price level from 1985 on.
- Extended eligibility for individual retirement accounts (IRAs) to all working households (\$4,000 for two-earner couples, \$2,250 for one-earner couples). Made both the contribution and the interest

earned tax free. Included more generous allowances for Keoghs and “all savers certificates.”

- Reduced the “marriage tax”: allowed married couples filing jointly to deduct 5 percent in 1982 and 10 percent thereafter of their earnings up to \$30,000. Under the previous law, two-earner couples paid higher taxes if they married because their combined income would push them into higher tax brackets.
- Specified that starting in 1985, taxpayers would be allowed to exclude 15 percent of interest income up to \$3,000.
- Cut top rate on capital gains from 28 percent to 20 percent.

Appendix B: Main Features of Tax Law Changes in the 1980a (Continued)

Business taxes

- Allowed accelerating cost recovery system (ACRS) for depreciating capital, lowering the average write-off period for equipment from 8.6 to 5.0 years, and for industrial plant from 23.8 to 15 years (Council of Economic Advisers 1982, p. 122)
- Reduced the declining balance for equipment from 200 percent to 150 percent, but raised the declining balance for structures from straight-line to 175 percent. Mandated further acceleration for subsequent years.
- Extended the investment tax credit to short-term assets not previously covered.
- Allowed "safe harbor leasing" permitted companies that cannot use all their tax credits to lease equipment from other companies. The latter earn the tax credit and then pass it through to the capital users by charging a low rental rate.

The Tax Equity and Fiscal Responsibility Act (TEFRA), 1982

Personal taxes

- Chipped away at the generous provisions under ERTA. "It added to the individual alternative minimum tax (AMT), increased the floor for deductible medical expenses and casualty losses, [and] taxed more of unemployment benefits" (Fullerton 1990, p. 32)
- Imposed 10 percent withholding on interest and dividends for the first time. (This provision was repealed the following year.)

Business taxes

- Put restrictions on safe harbor leasing.
- Scaled back the value of depreciation allowances by reducing the depreciable base of an asset by 50 percent of the value of the investment tax credit and by eliminating planned further accelerations in depreciation schedules.
- Introduced other minor changes: "reduced deductions for some mineral companies, required capitalization and amortization of construction period interest and property taxes, amended the completed contract method of accounting, accelerated corporate estimated tax payments, limited the use of tax-exempt industrial development bonds, restricted allowable pension contributions and benefits, and amended provisions for foreign income, life insurance companies, and unemployment taxes" (Fullerton 1990, p. 32)

Social Security Act, 1983 Amendment

- Added to and accelerated already planned increases in tax rates. Mandated an increase in the combined employer-employee tax rate from 13.4 percent to 15.3 percent during 1983-90, and raised the self-

employed rate from 9.35 percent to 15.3 percent.

- Expanded coverage to include all new federal employees and employees of nonprofit corporations.
- Altered tax exemption for benefit payments. Made 50 percent of benefits taxable for individuals (couples) with incomes greater than \$25,000 (\$30,000) per year.

The Deficit Reduction Act (DEFRA), 1984

- Addressed a broad range of arcane details of the tax code, undoing some of the special provisions and loopholes created in the previous twenty years.
- Raised the depreciation lifetime for structures from fifteen to nineteen years.

The Tax Reform Act (TRA), 1986

Personal taxes

- Stipulated that by 1988 two brackets of 15 percent and 28 percent replace fourteen brackets ranging from 11 percent to 50 percent. Because of a phasing out of deductions, upper-middle income earners actually face a 33 percent marginal rate.
- Raised the effective capital gains tax rate to 28 percent.
- Broadened the tax base to include all long-term capital gains, state and local sales taxes, IRAs for high-income persons with employer-provided plans, nonmortgage consumer interest payments, miscellaneous itemized deductions less than 2 percent of adjusted gross income, net losses from passive investments, and net losses from active real estate investments for high-income earners. (This last category of losses cannot be deducted from ordinary income and must be carried forward and deducted from net income generated by like activities in later years.)
- Partially offset the base broadening by doubling the personal exemption and increasing the standard deduction (by 36 percent for joint returns and 21 percent for single returns). Increased the earned income credit, eliminating the social security tax for low income people.

Business taxes

- Lowered the corporate rate from 46 percent to 40 percent in 1987 and 34 percent thereafter.
- Repealed the investment tax credit, effective January 1986.
- Made depreciation rules less generous. Raised the average depreciation life for equipment from 4.6 to 6 years, and for structures from 19 to 31.5 years. Raised the declining balance for equipment from 150 percent to 200 percent, but reduced the declining balance for structures from 175 percent to straight-line.
- Increased the alternative minimum tax.

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