3. STEWARDSHIP: TOWARD A FEDERAL BALANCE SHEET

Introduction

The Government's financial condition can only be properly evaluated using a broad range of data—more than would usually be shown on a business balance sheet—and several complementary perspectives. This chapter presents a framework for such analysis. No single table in the chapter is the equivalent of a Federal balance sheet, but taken as a whole, the chapter provides an overview of the Government's resources, the current and future claims on them, and some idea of what the taxpayer gets in exchange for these resources. This is the kind of assessment for which a financial analyst would turn to a business balance sheet, modified to take into account the Government's unique roles and circumstances.

Because there are important differences between Government and business, and because there are serious limitations on the available data, this chapter's findings should be interpreted with caution; its conclusions are tentative and subject to future revision.

The presentation consists of three parts:

- Part I reports on what the Federal Government owns and what it owes. Table 3–1 summarizes this information. The assets and liabilities in this table are a useful starting point for analysis, but they are only a partial reflection of the full range of Government resources and responsibilities. The table provides a comprehensive estimate of the value of the assets actually owned by the Government, but the Government is able to draw on resources in addition to these. It can tax and use other measures to meet future obligations. The liabilities shown in the table include all the binding commitments resulting from prior Government action, but the Government's responsibilities are much broader than this.
- Part II presents possible paths for the Federal budget extending beyond the normal budget window and summarized in Table 3–2. This Part shows the full scope of the Government's long-run financial burdens and the resources that it will have available to meet them. Some future claims on the Government deserve special emphasis because of their importance to individuals' retirement plans. Table 3–3 summarizes the condition of the Social Security and Medicare trust funds and how that condition changed between 2000 and 2001.
- Part III features information on national economic and social conditions which are affected by what the Government does. Table 3–4 presents summary data for total national wealth, while highlighting the Federal investments that have contributed to that wealth. Table 3–5 presents a small sample of economic and social indicators.

Relationship with FASAB Objectives

The framework presented here meets the stewardship objective [1] for Federal financial reporting recommended by the Federal Accounting Standards Advisory Board (FASAB) and adopted for use by the Federal Government in September 1993.

> *Federal financial reporting should assist report users in assessing the impact on the country of the Government's operations and investments for the period and how, as a result, the Government's and the Nation's financial conditions have changed and may change in the future. Federal financial reporting should provide information that helps the reader to determine:*
>
> *3a. Whether the Government's financial position improved or deteriorated over the period.*
>
> *3b. Whether future budgetary resources will likely be sufficient to sustain public services and to meet obligations as they come due.*
>
> *3c. Whether Government operations have contributed to the Nation's current and future well-being.*

The presentation here is an experimental approach for meeting this objective at the Government-wide level.

What Can Be Learned from a Balance Sheet Approach

The budget is an essential tool for allocating resources within the Federal Government and between the public and private sectors; but the standard budget presentation, with its focus on annual outlays, receipts, and the surplus or deficit, does not provide all the information needed to analyze the Government's financial and investment decisions. While a business is ultimately judged by a single number—the bottom line in its balance sheet—for the national Government the ultimate test is how its actions affect the country, and that is not possible to sum up with a single statistic.

[1] Statement of Federal Financial Accounting Concepts, Number 1, *Objectives of Federal Financial Reporting,* September 2, 1993. Other objectives are budgetary integrity, operating performance, and systems and controls.

The data needed to judge the Government's performance go beyond the assets its owns or the liabilities that might appear on a balance sheet. Consider, for example, Federal investments in education or infrastructure whose returns flow mainly to the private sector and which are often owned by households, private businesses or State and local governments. From a balance-sheet standpoint, these investments might appear to be superfluous or even wasteful, since the Government does not own the assets that these investments generate; but such investments can make a real contribution to the economy and to people's lives. A framework for evaluating Federal finances needs to take into account the value of such Federal investments, even when the return they earn does not accrue to the Federal Government.

QUESTIONS AND ANSWERS ABOUT THE GOVERNMENT'S "BALANCE SHEET"

1. According to Table 3–1, the Government's liabilities exceed its assets. No business could operate in such a fashion. Why does the Government not manage its finances more like a business?

The Federal Government has fundamentally different objectives from a business enterprise. The primary goal of every business is to earn a profit, and the Federal Government properly leaves almost all activities at which a profit could be earned to the private sector. For the vast bulk of the Federal Government's operations, it would be difficult or impossible to charge prices—let alone prices that would cover expenses. The Government undertakes these activities not to improve its balance sheet, but to benefit the Nation—to foster not only monetary but also nonmonetary values.

For example, the Federal Government invests in education and research. The Government earns no direct return from these investments; but the Nation and its people are made richer if they are successful. The returns on these investments show up not as an increase in the Government assets but as an increase in the general state of knowledge and in the capacity of the country's citizens to earn a living. A business's motives for investment are quite different; business invests to earn a profit for itself, not others, and if its investments are successful, their value will be reflected in its balance sheet. Because the Federal Government's objectives are different, its balance sheet behaves differently, and should be interpreted differently.

2. Table 3–1 seems to imply that the Government is insolvent. Is it?

No. Just as the Federal Government's responsibilities are of a different nature than those of a private business, so are its resources. Government solvency must be evaluated in different terms.

What the table shows is that those Federal obligations that are most comparable to the liabilities of a business corporation exceed the estimated value of the assets the Federal Government actually owns. However, the Government has access to other resources through its sovereign powers. These powers, which include taxation, allow the Government to meet its present obligations and those that are anticipated from future operations even though the Government's assets are less than its liabilities.

The financial markets clearly recognize this reality. The Federal Government's implicit credit rating is the best in the United States; lenders are willing to lend it money at interest rates substantially below those charged to private borrowers. This would not be true if the Government were really insolvent or likely to become so. Where governments totter on the brink of insolvency, lenders are either unwilling to lend them money, or do so only in return for a substantial interest premium.

3. Why does the Government not keep a proper set of books?

The Government is not a business, and accounting standards designed to illuminate how much a business earns and how much equity it has could provide misleading information if applied to the Government. The Federal Accounting Standards Advisory Board (FASAB) has developed, and the Government has adopted, a conceptual accounting framework that reflects the Government's distinct functions and answers the questions for which Government should be accountable. This framework addresses budgetary integrity, operating performance, stewardship, and systems and controls. FASAB has also developed, and the Government has adopted, a full set

QUESTIONS AND ANSWERS ABOUT THE GOVERNMENT'S "BALANCE SHEET"—Continued

of accounting standards. Federal agencies now issue audited financial reports that follow these standards and an audited Government-wide consolidated financial report is now being issued as well. The American Institute of Certified Public Accountants (AICPA) has recognized FASAB as the body designated to establish generally accepted accounting principles (GAAP) for Federal governmental entities. In short, the Federal Government does follow GAAP just as businesses and State and local governments do for their activities, although the relevant principles differ among the groups.

This chapter is intended to address the "stewardship objective"—assessing the interrelated condition of the Federal Government and the Nation. The data in this chapter illuminate the tradeoffs and connections between making the Federal Government "better off" and making the Nation "better off." The Government does not have a "bottom line" comparable to that of a business corporation, and some analysts have found the absence of a bottom line to be frustrating, but it would not help to pretend that such a number exists when clearly it does not.

4. Why is Social Security not shown as a liability in Table 3–1?

Future Social Security benefits are a political and moral responsibility of the Federal Government, but these benefits are not a liability in the usual sense. The Government has unilaterally decreased as well as increased Social Security benefits in the past, and future reforms could alter them again. When the amount in question can be changed unilaterally, it is not ordinarily considered a liability.

Other Federal programs exist that are similar to Social Security in the promises they make—Medicare, Medicaid, Veterans pensions, and Food Stamps—for example. Few have suggested counting the future benefits expected under these programs as Federal liabilities, yet it would be difficult to justify a different accounting treatment for them if Social Security were to be classified as a liability. There is no bright line dividing Social Security from other programs that promise benefits to people, and all the Government programs that do should be accounted for similarly.

Furthermore, if future Social Security benefits were to be treated as a liability, logic would suggest that future payroll tax receipts that are earmarked to finance those benefits ought to be considered an asset. Other tax receipts, however, are not counted as Government assets, and for good reason. The Government does not own the wealth on which its future taxes depends. Counting other taxes on the Government's balance sheet would be wrong, while treating Social Security taxes differently from other taxes would be highly questionable.

Under Generally Accepted Accounting Principles (GAAP), Social Security is not considered to be a liability, so omitting it from Table 3–1 is consistent with the accounting standards developed by FASAB.

5. When the baby-boom generation begins to retire in large numbers about ten years from now, the deficit could be larger than it ever was before. Should this not be reflected in evaluating the Government's financial condition?

The aging of the U.S. population will become dramatically evident when the baby-boomers begin to retire, and this demographic transition poses serious long-term problems for Federal entitlement programs and the budget. The second part of this chapter describes how the budget is likely to evolve under possible alternative scenarios when the baby-boomers retire and beyond. It is clear from these projections, and from similar information provided by the annual Trustees' Reports for Social Security and Medicare, that reforms are needed in these programs to meet the long-term challenges.

QUESTIONS AND ANSWERS ABOUT THE GOVERNMENT'S "BALANCE SHEET"—Continued

6. Would it be sensible for the Government to borrow to finance needed capital—permitting a deficit in the budget—so long as the borrowing did not exceed the amount spent on investments?

This rule might not actually permit much extra borrowing. If the Government were to finance new capital by borrowing, it should plan to pay off the debt incurred to finance old capital as the capital is used up. The net new borrowing permitted by this rule should not exceed the amount of net investment after adjusting for capital consumption, but as discussed in Chapter 7 of Analytical Perspectives, Federal net investment in physical capital is usually not very large and on occasion has even been negative, so little deficit spending would have been justified by this borrowing-for-investment criterion, at least in recent years.

The Federal Government also funds substantial amounts of physical capital that it does not own, such as highways and research facilities, and it funds investment in intangible "capital" such as education and training and the conduct of research and development. A private business would never borrow to spend on assets that would be owned by someone else. However, such spending is a principal function of Government. It is not clear whether this type of capital investment would fall under the borrowing-for-investment criterion. Certainly, these investments do not create Federally owned assets, which suggests they should not be included for this purpose even though they are an important part of national wealth.

There is another difficulty with the logic of borrowing to invest. Businesses expect investments to earn a return large enough to cover their cost. In contrast, the Federal Government does not generally expect to receive a direct payoff from its investments, whether or not it owns them. In this sense, Government investments are no different from other Government expenditures, and the fact that they provide services over a longer period of time is no justification for excluding them when calculating the surplus or deficit.

Finally, the Federal Government must pursue policies that support the overall economic well-being of the Nation and its security interests. For such reasons, the Government may deem it desirable to run a budget surplus, even if this means paying for its own investments from current receipts, and there will be other times when it is necessary to run a deficit, even one that exceeds Government net investment. Considerations in addition to the size of Federal investment must be weighed in choosing the right level of the surplus or deficit.

7. Is it appropriate to include the Social Security surplus when measuring the Government's consolidated budget surplus?

The Federal budget has many purposes. It should not be surprising that, with more than one purpose, the budget is presented in more than one way. None of these measures is always right, or always wrong; it depends upon the purpose to which the budget is put.

For the purpose of measuring the Government's effects on the economy, it would be misleading to omit Social Security or any other part of the budget, as all parts of the budget affect the economy.

For purposes of fiscal discipline, leaving out particular Government activities could actually be dangerous. The principle of a "unified" all-inclusive budget has been used to forestall the practice of moving favored programs off-budget—which has been done to shield those programs from scrutiny and funding discipline.

For setting long-run fiscal policy, however, an alternative to the unified budget has been useful. In particular, the Congress has moved Social Security off-budget. The purpose of doing so was to stress the need to provide independent, sustainable funding for Social Security in the long term; and to show the extent to which the rest of the budget has relied on annual Social Security surpluses to make up for its own shortfall.

Although it should not be the ending point, a good starting point for analysis is Table 3–1, which shows the Government's assets and liabilities. This tabulation of net liabilities is based on data from a variety of public and private sources. It has sometimes been suggested that the Federal Government's assets, if fully accounted for, would exceed its debts. Table 3–1 clearly shows that this has not been correct for decades. Government debts are larger than Government assets, although in recent years, Government budget surpluses did allow the Government to reduce its debt and thereby lower its net liabilities.

On the liabilities side, Table 3–1 includes only the Government's binding obligations—such as Treasury debt and the present discounted value of the pensions owed to Federal employees, a form of deferred compensation. These obligations have counterparts in the business world, and would appear on a business balance sheet. Accrued obligations for Government insurance policies and the estimated present value of failed loan guarantees and deposit insurance claims are also analogous to private liabilities, and are included here with the other Government liabilities. Although large in value, these obligations form only a subset of the Government's total financial responsibilities.

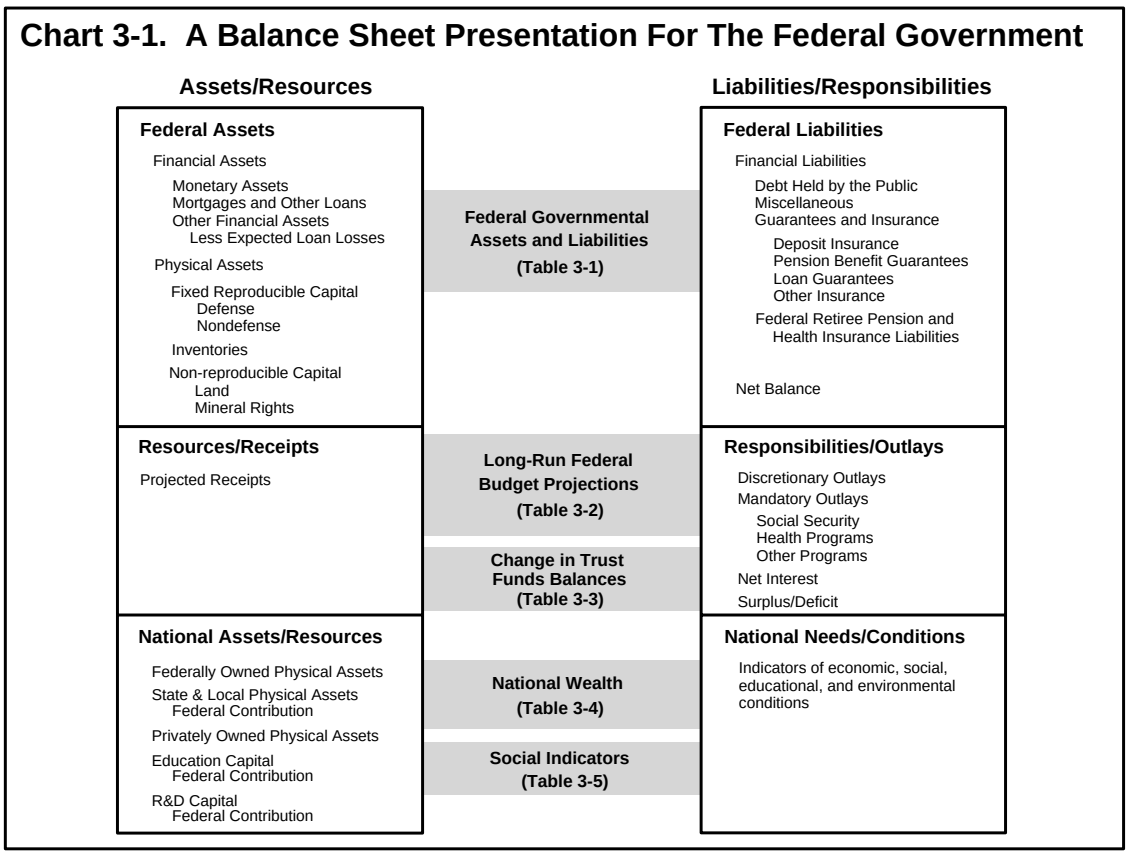
The Federal Government also has resources that go beyond the assets that would normally appear on a balance sheet, such as those that appear in Table 3–1. These other resources include the Government's sovereign powers to tax, regulate commerce, and set monetary policy. The best way to analyze the limits of all of the Government's fiscal powers is to make a long-run projection of the Federal budget (as is done in Part II of this chapter). The budget provides a comprehensive measure of the Government's annual cash flows. Projecting it forward shows how the Government is expected to use its powers to generate cash flows in the future.

The Government has established a broad range of programs that dispense cash and other benefits to individual recipients. The Government is not constitutionally obligated to continue payments under these programs; the benefits can be modified or even ended at any time, subject to the decisions of Congress, and such changes are a regular part of the legislative cycle. For this and other reasons, these programs are not Government "liabilities." It is likely, however, that many of these programs will remain Federal responsibilities in some form for the foreseeable future, and they are projected to continue as such in the long-run projections presented in Part II.

The numbers in the budget and in Table 3–1 are silent on the issue of whether the public is receiving value for its tax dollars or whether Federal assets are being used effectively. Information on that point requires performance measures for Government programs supplemented by appropriate information about conditions in the economy and society. Some such data are currently available, but more measures need to be developed to obtain a full picture. The changes in budgeting practices discussed in Chapter 1 will contribute to the long-run goal of more complete information about Government programs by permitting a closer alignment of the cost of programs with performance measures.

The presentation that follows consists of a series of tables and charts. Taken together, they serve a similar function to a business balance sheet. The schematic diagram, Chart 3–1, shows how they fit together. The tables and charts should be viewed as an ensemble, the main elements of which are grouped in two broad categories—assets/resources and liabilities/responsibilities.

- Reading down the left-hand side of Chart 3–1 shows the range of Federal resources, including assets the Government owns, tax receipts it can expect to collect, and national wealth that provides the base for Government revenues.
- Reading down the right-hand side reveals the full range of Federal obligations and responsibilities, beginning with Government's acknowledged liabilities based on past actions, such as the debt held by the public, and going on to include future budget outlays. This column ends with a set of indicators highlighting areas where Government activity affects society or the economy.



PART I—THE FEDERAL GOVERNMENT'S ASSETS AND LIABILITIES

Table 3–1 summarizes what the Government owes as a result of its past operations netted against the value of what it owns for a number of years beginning in 1960. Assets and liabilities are measured in terms of constant FY 2001 dollars. Ever since 1960, Government liabilities have exceeded the value of assets (see chart 3–2). In the late 1970s, a speculative run-up in the prices of oil, gold, and other real assets temporarily boosted the value of Federal holdings, but subsequently those prices declined, and only recently have they regained the level they had reached temporarily in 1980.[2]

Currently, the total real value of Federal assets is estimated to be about 35 percent greater than it was in 1960. Meanwhile, Federal liabilities have increased by 173 percent in real terms. The decline in the Federal net asset position has been principally due to persistent Federal budget deficits and the relatively slow increase in Federal asset holdings, although other factors have been important in some years. For example, the decline from 2000 to 2001 was mainly due to a large increase in promised Federal health benefits for military retirees. The increase in the discounted present value of these benefits was large enough to offset a unified budget surplus and a rise in Federal asset values. The shift from budget deficits to budget surpluses in the late 1990s reduced Federal net liabilities, which peaked in 1996. Currently, the net excess of liabilities over assets is about $3.4 trillion, or $12,000 per capita, compared with net liabilities of $3.9 trillion (FY 2001 dollars) and $14,800 per capita (FY 2001 dollars) in 1995.

[2] This temporary improvement highlights the importance of the other tables in this presentation. What is good for the Federal Government as an asset holder is not necessarily favorable to the economy. The decline in inflation in the early 1980s reversed the speculative run-up in gold and other commodity prices. This reduced the balance of Federal net assets, but it was good for the economy and the Nation as a whole.

Table 3–1. GOVERNMENT ASSETS AND LIABILITIES*

(As of the end of the fiscal year, in billions of 2001 dollars)

	1960	1965	1970	1975	1980	1985	1990	1995	1999	2000	2001
ASSETS											
Financial Assets:											
Cash and Checking Deposits	43	62	39	31	48	31	42	43	66	57	51
Other Monetary Assets	1	1	1	1	2	2	2	1	5	6	12
Mortgages	28	27	40	42	77	78	100	68	81	78	75
Other Loans	102	141	176	176	226	296	209	163	192	191	193
less Expected Loan Losses	–1	–3	–5	–9	–17	–17	–20	–25	–52	–38	–38
Other Treasury Financial Assets	62	77	68	61	86	127	201	241	221	219	232
Total	235	305	319	302	421	517	535	492	512	513	524
Nonfinancial Assets:											
Fixed Reproducible Capital:	1,019	1,020	1,067	974	865	1,025	1,085	1,125	1,008	979	969
Defense	885	842	851	712	608	733	776	793	671	641	621
Nondefense	134	179	215	261	257	292	309	332	338	338	348
Inventories	269	233	217	194	240	274	242	171	142	142	142
Nonreproducible Capital:	434	446	428	633	1,014	1,088	857	638	737	943	1,013
Land	94	131	165	261	333	346	355	265	358	401	426
Mineral Rights	340	315	263	372	681	742	501	373	379	542	587
Subtotal	1,722	1,699	1,711	1,801	2,119	2,387	2,184	1,934	1,887	2,064	2,124
Total Assets	1,957	2,004	2,030	2,103	2,540	2,904	2,718	2,427	2,399	2,577	2,648
LIABILITIES											
Financial Liabilities:											
Debt held by the Public	1,150	1,187	1,075	1,094	1,352	2,230	3,043	4,026	3,807	3,490	3,320
Trade Payables and Miscellaneous	34	37	45	59	84	110	160	132	106	104	91
Subtotal	1,184	1,224	1,120	1,153	1,437	2,340	3,203	4,158	3,913	3,594	3,412
Insurance Liabilities:											
Deposit Insurance	0	0	0	0	2	9	73	5	1	1	3
Pension Benefit Guarantee [1]	0	0	0	44	32	45	44	21	42	41	51
Loan Guarantees	0	0	2	7	13	11	16	30	36	38	39
Other Insurance	32	29	22	20	28	17	20	18	17	16	16
Subtotal	32	29	25	71	75	82	154	74	97	97	109
Federal Pension and Retiree Health Liabilities											
Pension Liabilities	810	1,018	969	1,055	1,856	1,839	1,792	1,730	1,730	1,754	1,765
Retiree Health Insurance Benefits	194	244	232	253	445	441	430	415	385	394	786
Total	1,004	1,262	1,201	1,307	2,301	2,280	2,222	2,144	2,115	2,147	2,551
Total Liabilities	**2,220**	**2,516**	**2,346**	**2,531**	**3,813**	**4,702**	**5,579**	**6,376**	**6,125**	**5,837**	**6,071**
Balance	**–263**	**–511**	**–316**	**–428**	**–1,273**	**–1,797**	**–2,861**	**–3,949**	**–3,726**	**–3,261**	**–3,423**
Addenda:.											
Balance Per Capita (in 2001 dollars)	**–1,461**	**–2,635**	**–1,544**	**–1,983**	**–5,581**	**–7,527**	**–11,431**	**–14,802**	**–13,326**	**–11,527**	**–11,952**
Ratio to GDP (in percent)	**–10.1**	**–15.6**	**–8.1**	**–9.6**	**–23.9**	**–28.4**	**–38.8**	**–47.6**	**–38.2**	**–32.1**	**–33.5**

*This table shows assets and liabilites for the Government as a whole excluding the Federal Reserve System.
[1] The model and data used to calculate this liability were revised for 1996–1999.

Assets

Table 3–1 offers a comprehensive list of the financial and physical resources owned by the Federal Government.

Financial Assets: According to the Federal Reserve Board's Flow-of-Funds accounts, the Federal Government's holdings of financial assets amounted to $0.5 trillion at the end of FY 2001. Government-held mortgages and other loans (measured in constant dollars) reached a peak in the late 1980s. Since then, the real value of Federal loans has declined. Holdings of mortgages rose sharply in the late 1980s and then declined in the 1990s, as the Government acquired mortgages from failed savings and loan institutions and then liquidated them.

The face value of mortgages and other loans overstates their economic worth. OMB estimates that the discounted present value of future losses and interest subsidies on these loans is about $38 billion as of 2001. These estimated losses are subtracted from the face value of outstanding loans to obtain a better estimate of their economic worth.

Reproducible Capital: The Federal Government is a major investor in physical capital and computer software. Government-owned stocks of such capital have amounted to about $1.0 trillion for most of the last 40 years (OMB estimate). This capital consists of defense equipment and structures, including weapons systems, as well as nondefense capital goods. Currently, slightly less than two-thirds of the capital is defense equipment or structures. In 1960, defense capital was

about 90 percent of the total. In the 1970s, there was a substantial decline in the real value of U.S. defense capital and there was another large decline in the 1990s after the end of the Cold War. Meanwhile, nondefense Federal capital has increased at an average annual rate of around 2–1/2 percent.

Non-reproducible Capital: The Government owns significant amounts of land and mineral deposits. There are no official estimates of the market value of these holdings (and of course, in a realistic sense, much of these resources would never be sold). Researchers in the private sector have estimated what they are worth, however, and these estimates are extrapolated in Table 3–1. Private land values fell sharply in the early 1990s, but they have risen since 1993. It is assumed here that Federal land shared in the decline and the subsequent recovery. Oil prices have been on a roller coaster since the mid-1990s. First, they declined sharply in 1997–1998 in the wake of the Asian financial crisis, which reduced world petroleum demand. In 1999–2000, oil prices rebounded sharply, but in 2001 they fell again, although the average for the year remained higher than in FY 2000. The fluctuations caused the estimated value of Federal mineral deposits to fluctuate as well. (The estimates omit some valuable assets owned by the Government, such as works of art and historical artefacts, because the valuation for these assets would have little realistic basis, and because, as part of the Nation's historical heritage, these objects would never be sold.)

Total Assets: The total real value of Government assets is lower now than it was from 1981 through 1992, mainly because of declines in defense capital and inventories in the 1990s following the end of the Cold War. Government asset values have risen strongly since 1998, however, propelled by rising prices for land and energy, and because the decline in defense capital has moderated. Even with the decline in their estimated value since 1992, the Government's asset holdings are vast. At the end of FY 2001, Government assets are estimated to be worth about $2.6 trillion.

Liabilities

Table 3–1 covers all those liabilities that would also appear on a business balance sheet, but only those liabilities. These include various forms of publicly held Federal debt, Federal pension and health insurance obligations to civilian and military retirees, and the estimated liability arising from Federal insurance and loan guarantee programs.

Financial Liabilities: Financial liabilities amounted to about $3.4 trillion at the end of 2001, down from a peak value of $4.2 trillion in 1996. The single largest component of these liabilities was Federal debt held by the public, which amounted to around $3.3 trillion at the end of FY 2001. In addition to the debt held by the public, the Government owes about $0.1 trillion in miscellaneous liabilities. The publicly held debt has been declining for several years, because of the unified budget surplus. As the budget returns to deficit, this decline in public debt will end, but if the deficits remain small, the ratio of debt and net financial liabilities to GDP could continue to shrink.

Guarantees and Insurance Liabilities: The Federal Government has contingent liabilities arising from loan guarantees and insurance programs. When the Government guarantees a loan or offers insurance, cash disbursements may initially be small or, if a fee is charged, the Government may even collect money; but the risk of future cash payments associated with such commitments can be large. The figures reported in Table 3–1 are estimates of the current discounted value of prospective future losses on outstanding guarantees and insurance contracts. The present value of all such losses taken together is about $0.1 trillion. The resolution of the many failures in the savings and loan and banking industries has helped to reduce the liabilities in this category by about a third since 1990.

Federal Pension and Retiree Health Liabilities: The Federal Government owes pension benefits as a form of deferred compensation to retired workers and to current employees who will eventually retire. It also provides its retirees with subsidized health insurance through the Federal Employees Health Benefits program. The amount of these liabilities is large, and there was a large increase in these liabilities in 2001. The discounted present value of the benefits is estimated to have been around $2.6 trillion at the end of FY 2001 up from $2.1 trillion in 2000.[3] The main reason for the increase was a large expansion in Federal military retiree health benefits legislated in 2001.

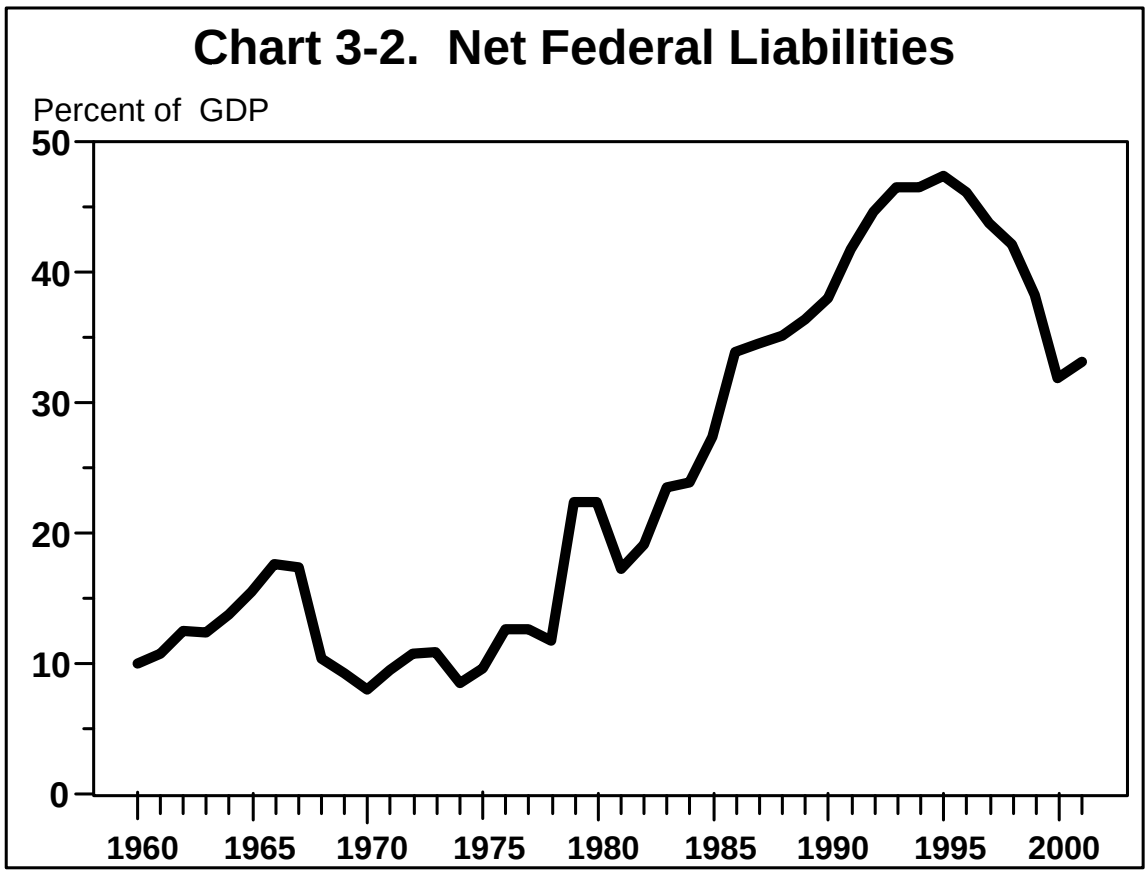
The Balance of Net Liabilities

The Government need not maintain a positive balance of net assets to assure its fiscal solvency, and the buildup in net liabilities since 1960 did not significantly damage Federal creditworthiness. There are, however, limits to how much debt the Government can assume without putting its finances in jeopardy. By 1995, Federal net liabilities had reached 48 percent of GDP, and although this remained well below the limit that would have threatened Federal creditworthiness, the sharp upward trend in the ratio of liabilities to GDP, which by 1995 had continued for two decades, was ominous.

Since then, however, there has been a major reduction in the ratio of Federal net liabilities to GDP. From 1995 through 2000, the net balance as a percentage of GDP fell for five straight years, and it would have fallen again in 2001 had there not been a substantial rise in estimated health insurance liabilities for Federal retirees last year. This was a one-time increase and is not expected to be repeated in future years. The ratio of net liabilities to GDP is down by 30 percent from its peak level, and the real value—adjusted for inflation—of net liabilities is $0.6 trillion (FY 2001 dol-

[3] The pension liability is the actuarial present value of benefits accrued-to-date based on past and projected salaries. The 2001 liability is extrapolated from recent trends. The retiree health insurance liability is based on actuarial calculation of the present vale of benefits promised under existing programs. Actuarial estimates are only available since 1997. For earlier years the liability was assumed to grow in line with the pension liability, and for that reason may differ significantly from what the actuaries would have calculated for this period.

lars) lower than at its peak in FY 1996. The decline in net liabilities reflects the shift from budget deficits to surpluses, and a recent recovery in some Federal asset prices. As the budget returns to deficit, net liabilities are likely to increase again for a time, but if the deficits are relatively small and temporary, most of the improvement since 1996 ought to be maintained.



PART II—THE BALANCE OF RESOURCES AND RESPONSIBILITIES

This part of the presentation describes long-run projections of the Federal budget that extend beyond the normal budget horizon. Forecasting the economy and the budget so far into the future is highly uncertain. Indeed, accurate forecasting is not really possible over such a long time period. Future budget outcomes depend on a host of unknowns—constantly changing economic conditions, unforeseen international developments, unexpected demographic shifts, the unpredictable forces of technological advance, and evolving political preferences to name a few. The uncertainties increase the further into the future the projections extend.

Given these uncertainties, the best that can be done is to work out the implications of expected developments on a "what if" basis by making explicit assumptions and using the analysis to work out their implications. Despite these limitations, long-run budget projections constructed under such assumptions can be useful in sounding warnings about potential problems. Federal responsibilities extend well beyond the next five or ten years, and problems that may be small in that time frame can become much larger if allowed time to grow. There is no time limit on the Government's constitutional responsibilities, and programs like Social Security are intended to continue indefinitely.

The Threat to the Budget from the Impending Demographic Transition: It is evident even now that there will be mounting challenges to the budget that could begin to emerge before the end of this decade. In 2008, the first of the huge baby-boom generation born after World War II will reach age 62 and become eligible for early retirement under Social Security. In the years that follow, the population over age 62 will skyrocket, putting serious strains on the budget because of increased expenditures for Social Security and for the Government's health programs which serve the elderly—Medicare and increasingly Medicaid. Long-range projections can help define how serious these strains might become.

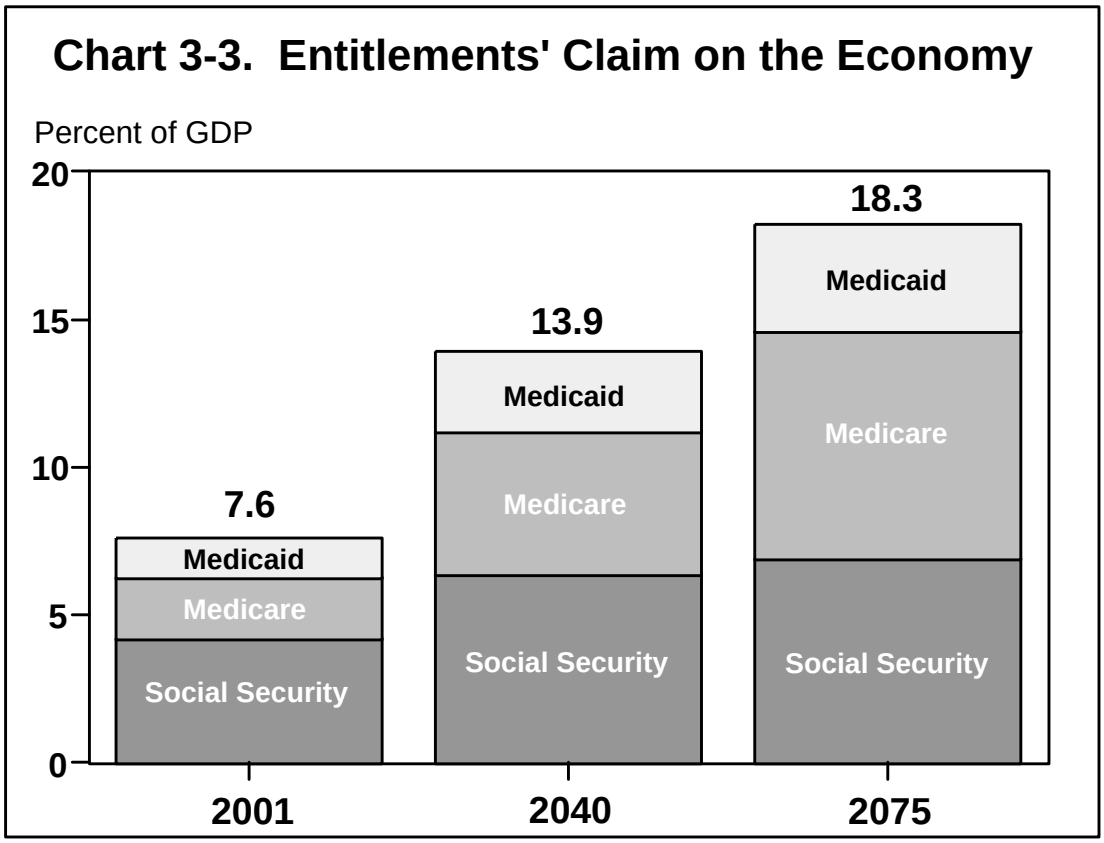
The U.S. population has been aging for decades, but a major demographic shift is now just over the horizon.

The baby-boom cohort has moved into its prime earning years, while the much smaller cohort born during the Great Depression has been retiring. Together these shifts in the population have temporarily held down the rate of growth in the number of retirees relative to the labor force. The suppressed budgetary pressures are likely to burst forth once the baby-boomers begin to receive Social Security, and that will begin to happen starting in 2008.

The pressures are expected to persist, however, even after the baby-boomers are gone. The Social Security actuaries project that the ratio of workers to Social Security beneficiaries will fall from around 3–1/2 currently to around 2 by the time most of the baby-boomers are retired. Because of lower fertility and improved mortality that ratio is not expected to rise again, even though it is projected to decline very little following the passing of the baby-boomers. With fewer workers to pay taxes that support the retired population, the budgetary pressures on the Federal retirement programs will persist. The problem posed by the demographic transition is a permanent one.

One way to see the extent of the budgetary problem is to examine the projected spending on Social Security, Medicare, and Medicaid. Currently, these programs account for 47 percent of non-interest Federal spending; up from 30 percent in 1980. By 2040, when most of the remaining baby-boomers will be in their 80s, these three programs could easily account for two thirds of non-interest Federal spending. At the end of the projection period, the figure rises to almost three-quarters of non-interest spending. In other words, under an extension of current budget policy, almost all of the budget would go to these three programs alone. That would considerably reduce the flexibility of the budget, and the Government's ability to respond to new challenges.

Measured relative to the size of the economy, the three major entitlement programs now amount to 8 percent of GDP.[4] By 2040, this share almost doubles to 14 percent, and in 2075 it is projected to reach 18 percent of GDP. Current projections suggest, absent structural changes in the programs, that the Federal Government will have to find another 10 percent of GDP to cover future benefits in these programs.



The Shortfall in Social Security: Social Security is intended to be self-financing. Workers and employers pay taxes earmarked for the Social Security trust funds, and the Funds disburse benefits. In recent years, the

[4] Over long periods when the rate of inflation is positive, comparisons of dollar values are meaningless. Even the low rate of inflation assumed in this budget will reduce the value of a 2001 dollar by about half by 2030, and by two thirds by 2050. For long-run comparison, it is much more useful to examine the ratio of budget totals to the expected size of the economy as measured by GDP.

Funds have been increasing in size as a result of a large Social Security surplus. At the end of FY 2001, the combined Old Age, Survivors and Disability Insurance (OASDI) trust funds had reached almost $1.2 trillion. Under current law, the demographic transition is projected to reverse this buildup of the trust funds. The program's actuaries project that by 2016, taxes flowing into the Funds will fall short of program benefits and expenses.[5] The Funds are projected to continue to grow for some years beyond this point because of positive interest income, but by 2025, the trust funds will peak and begin to be drawn down. By 2038, when even the youngest baby-boomers will be in their late 70s, the actuaries project that the OASDI trust funds will be exhausted. That would not mean that Social Security benefits would cease, because projected taxes would still be large enough to cover over 70 percent of projected benefits at that point, but the program could no longer sustain promised benefits out of earmarked tax receipts and trust fund interest alone (see accompanying box for a fuller discussion).

Social Security: The Long-Range Challenge

For 66 years, Social Security has provided retirement security and disability insurance for tens of millions of Americans through a self-financing system. The principle of self-financing is important because it compels corrections to the system in the event of projected financial imbalances.

While Social Security is running surpluses today, OMB projects it will begin running cash deficits within 20 years. Social Security's spending path is unsustainable if the demographic trends toward lower fertility rates and longer life spans continue. These trends imply that the number of workers available to support each retiree will decline from 3.4 today to an estimated 2.1 in 2030, and that the Government will not be able to meet current-law benefit obligations at current payroll tax rates

The future size of Social Security's shortfall cannot be known with any precision. Under the Social Security Trustees' 2001 intermediate-cost economic and demographic assumptions, the gap between Social Security receipts and outlays in 2040 is projected to be 1.7 percent of GDP. Under their high-cost assumptions, the shortfall in that year would be 76 percent larger, or 3.0 percent of GDP. The program's actuarial deficit, which indicates how much the payroll tax rate or benefits as a share of payroll would have to change today to maintain a positive balance in the Trust Funds over the next 75 years, was estimated to be –1.9 percent in the latest Trustees' report.

Long-range uncertainty underscores the importance of creating a system that is financially stable and self-contained. Otherwise, if the pessimistic assumptions turn out to be more accurate, the demands created by Social Security could compromise the rest of the budget and the Nation's economic health.

Moreover, the current structure of Social Security leads to substantial generational inequities in the average rate of return people can expect from the program. While previous generations fared well, individuals born today on average can expect to receive less than a two percent average annual real rate of return on their payroll tax contributions. Indeed, such estimates overstate the expected rate of return, because they assume no changes in current-law taxes or benefits even though meeting the projected financing shortfall through benefit cuts or additional revenues would further reduce Social Security's implicit rate of return for future cohorts. A 1995 analysis found that the average worker in the cohort born in 2000 would experience a 1.7 percent rate of return before accounting for Social Security's shortfall, and a 1.5 percent rate of return after adjusting revenues to keep the system solvent.

One way to address the issues of uncertainty and declining rates of return, while protecting national savings, would be to allow individuals to invest some of the payroll taxes they currently pay in personal retirement accounts. The President's Commission to Strengthen Social Security has recently reported on various options that would incorporate personal accounts as part of the Social Security framework. The budget discusses in more detail the Commission's findings and the options it has presented for discussion.

[5] The long-ranged projections discussed in this chapter are based on an extension of the Administration's economic projections from the budget, which differ somewhat from the economic assumptions used by the actuaries. Under the extended Administration projections this point would be reached a few years later and the other key dates highlighted in the Trustee's annual reports would also come somewhat later.

Medicare: The Long-Range Challenge

According to the Medicare Trustees most recent report issued last March, Medicare spending for the Hospital Insurance (HI) program is projected to exceed taxes going into the HI trust fund beginning in 2016, and the fund is projected to go bankrupt in 2029. Another way of measuring the expected HI shortfall is by the size of the HI trust fund's actuarial deficit, defined as the tax rate increase that would be required today to preserve a positive balance in the HI trust fund over the next 75 years. In their March 2001 report, the Trustees projected an actuarial deficit of –2.0 percent, a two thirds increase over the 2000 estimate of the deficit ,which was –1.2 percent (see Table 3–3). The large adjustment in the actuarial deficit was mainly due to the Trustees' acknowledgment that the growth rate of per capita HI expenditures is likely to be faster in the long run than had previously been assumed. The new assumption is that per capita HI spending will outpace the rate of growth in per capita GDP by a full percentage point. Although that marks a substantial increase in the projected growth rate compared with previous Trustees' reports, the difference would still be less than it has averaged over the last 20 years.

But, Medicare also has a second trust fund for Supplemental Medical Insurance (SMI), and the growth in per beneficiary SMI expenditures is also projected to exceed the growth rate of per capita GDP by a full percentage point in the latest Trustees' report. A comprehensive analysis of Medicare that takes account of both HI and SMI would show that Medicare already runs a deficit with the rest of the budget, not a surplus. Premiums paid by SMI beneficiaries fall short of total SMI spending, and the difference exceeds the current HI surplus. In fact, over the ten years 2003–2012, Medicare will require transfers from general revenue totaling $1.3 trillion.

The main reason for the projected shortfall in the Medicare Trust Funds is that the long-range projections of total Medicare spending show substantial growth. This is partly for demographic reasons. Beginning within ten years, the number of Medicare beneficiaries is expected to rise very rapidly, as the baby-boomers reach age 65 and become eligible for Medicare. Between 2010 and 2030, the number of persons age 65 and older is expected to rise from under 40 million to nearly 70 million. Meanwhile, as explained above, per capita spending is also expected to continue rising rapidly. Together these factors push up total spending very sharply, as a percentage of GDP, Medicare outlays are projected to quadruple increasing from around 2 percent in 2001 to over 8 percent by 2075. This is the fastest projected growth of any of the major entitlements, faster than both Social Security and Medicaid.
The Administration remains committed to working with Congress to reform Medicare in a manner that improves the long-run solvency of the entire program without raising Medicare payroll taxes.

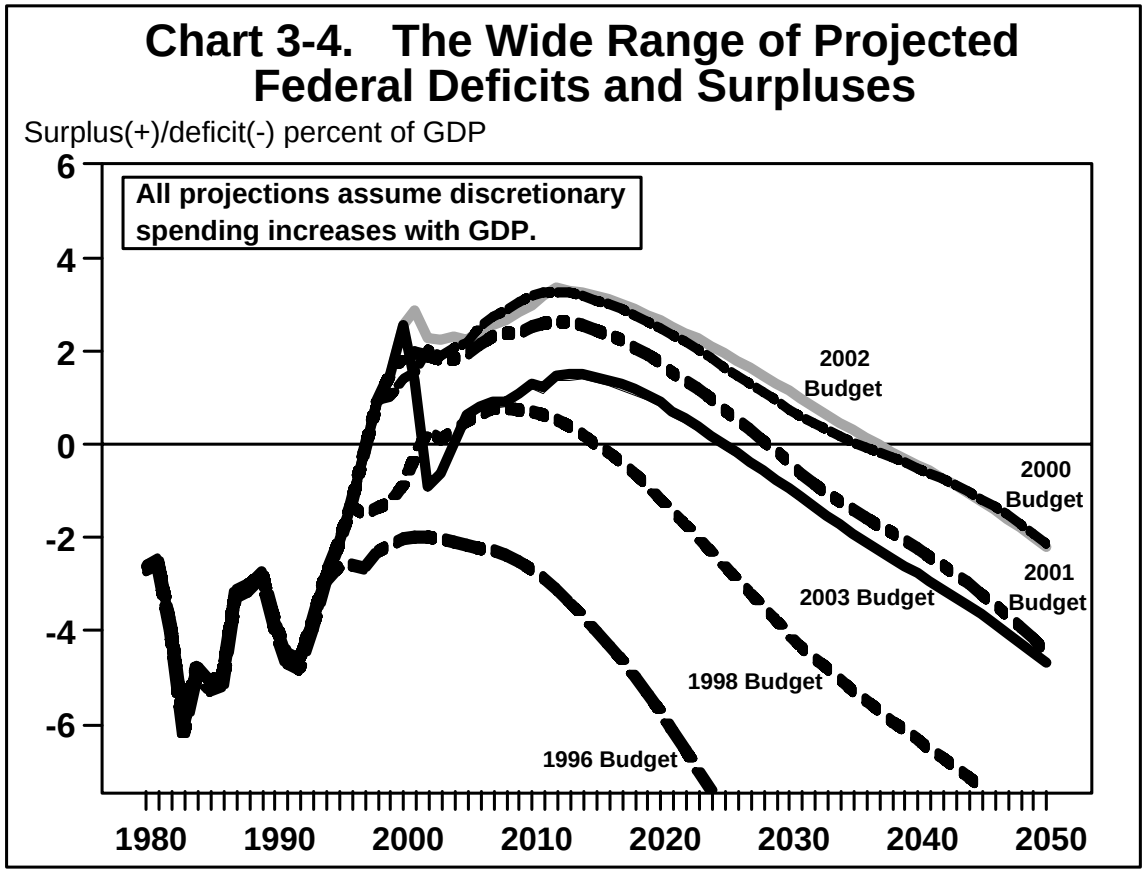
And in Medicare: Medicare faces a similar problem. Income to Medicare's Hospital Insurance (HI) trust fund is projected to exceed outgo until 2016, but thereafter the HI fund is projected to be depleted, and to reach zero in 2029, nine years earlier than the OASDI trust funds. Unlike Social Security, Medicare has never been completely self-financed. In addition to the HI program, Medicare also consists of Supplementary Medical Insurance (SMI), which covers medical bills outside of the hospital. SMI is funded by a combination of premiums charged to the beneficiaries, which cover about one-quarter of benefits, and general revenue. Even if the HI trust fund were to remain solvent indefinitely, Medicare as a whole would continue to be subsidized by the rest of the budget, and as Medicare costs rise in the future, the subsidy will increase (see accompanying box for a fuller discussion).

An Uncertain Long-Range Outlook.—At the beginning of the 1990s, when these long-run budget projections were first developed, the deficit was on an unstable trajectory. Given then-current economic projections and policies, the deficit was projected to mount steadily not only in dollar terms, but relative to the size of the economy. This pattern of rising deficits would have driven Federal debt held by the public to unsustainable levels. Policy actions during the 1990s reduced the deficits, and the strong economy that emerged in the second half of the 1990s did even more to eliminate them.

Because of the recent economic downturn and needed spending for defense and homeland security, the unified budget is now projected to return to deficit for a few years. The deficits are not large relative to the size of the overall economy, and if budget discipline is maintained while the economy recovers as expected, surpluses will return thereafter. Furthermore, if the policies and assumptions used for this budget are extended, the unified budget could continue in surplus into the next decade or even later. Eventually, however, the rising burden of entitlement spending will cause deficits to reappear unless there are structural reforms in the major entitlement programs. How long before these deficits are projected to show up again depends on economic and technical factors and policy decisions affecting the rest of the budget. Future stress on the budget appears to be unavoidable absent major reforms to the entitlement programs.

There is a wide range of uncertainty around any such long-range projections. As discussed further below, the projections are affected by many hard-to-foresee eco-

nomic and demographic factors, as well as by future policy decisions. In the ten years since OMB first began to experiment with such projections, the long-run outlook has varied considerably.



Economic and Demographic Assumptions.—Even though any such forecast is highly uncertain, long-run budget projections require starting with specific economic and demographic projections. The assumptions used as a starting point extend the Administration's medium-term economic projections used in preparing this budget augmented by the long-run demographic projections from the 2001 Social Security Trustees' Report.

- Inflation, unemployment and interest rates hold stable at 2.3 percent per year for CPI inflation, 4.9 percent for the unemployment rate, and 5.3 percent for the yield on 10-year Treasury notes.
- Productivity growth as measured by real GDP per hour continues at the same constant rate as in the Administration's medium-term projections—2.1 percent per year. (See chapter 2 for more detail on the Administration's economic assumptions).
- In line with the current projections of the Social Security Trustees, U.S. population growth is expected to slow from over 1 percent per year in the 1990s to about half that rate by 2030, and even less in the decades after 2030.
- The labor force participation rate declines as the population ages and the proportion of retirees in the population is projected to increase.
- Real GDP growth declines gradually after 2011 from 3.1 percent per year to an average annual rate of 2.4 percent, reflecting the effects of the projected slowdown in labor force growth combined with the assumed constant rate of productivity growth.

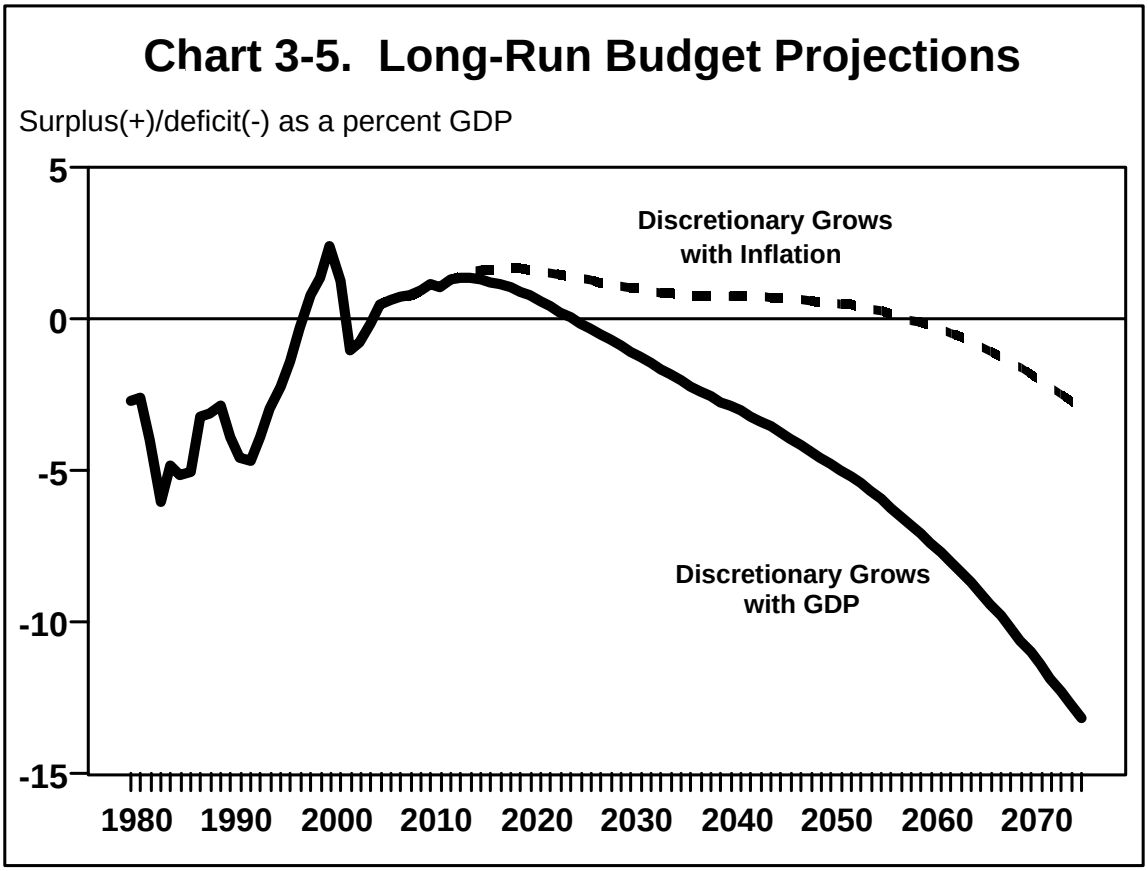
The economic projections described above are set by assumption and do not automatically change in response to changes in the budget outlook. This is unrealistic, but it simplifies comparisons of alternative policies.

Alternative Budget Projections.—These long-run projections generally assume that mandatory spending proceeds according to current law and that the policy proposals in the budget are adopted without assuming any other new programs or enhancements to existing programs. For the reasons discussed above, these assumptions imply that the major entitlement programs are projected to absorb an increasing share of budget resources. This is true under all likely assumptions re-

garding future discretionary spending. Chart 3–5 shows budget projections under the two main alternative assumptions that OMB has used in projecting discretionary spending: one holds discretionary spending constant in real dollars allowing it to increase only with the rate of inflation while the other holds discretionary spending constant in relation to GDP, which means it expands at the same rate over time as GDP is projected to grow.

- Social Security benefits, driven by the retirement of the baby-boom generation, rise from 4.2 percent of GDP in 2001 to 6.4 percent in 2040. They continue to rise after that but more gradually, eventually reaching 6.9 percent of GDP by 2075.[6]
- Medicare outlays expand quite rapidly, rising from 2.1 percent of GDP in 2001 to 4.8 percent of GDP in 2040, and 7.7 percent by 2075.
- Federal Medicaid spending goes up from 1.3 percent of GDP in 2001 to 2.7 percent in 2040 and to 3.6 percent of GDP in 2075.
- Holding discretionary spending constant in real dollars implies that it declines relative to GDP from 6.5 percent in 2001 to 3.7 percent in 2040, and to 2.1 percent in 2075. Alternatively, if discretionary spending is fixed as a share of GDP at the level reached in 2012, it maintains a constant 5.8 percent share of GDP through 2075.

Chart 3-5. Long-Run Budget Projections



[6] These benefit estimates reflect the economic assumptions described above, which differ somewhat from the assumptions in the Social Security Trustees' Report. The benefit estimates were prepared by the Social Security actuaries using OMB economic assumptions.

Table 3–2. LONG-RUN BUDGET PROJECTIONS OF 2003 BUDGET POLICY

(Percent of GDP)

	2000	2005	2010	2020	2030	2040	2050	2075
Discretionary Grows with GDP								
Receipts	20.8	19.2	19.2	19.2	19.4	19.4	19.6	19.6
Outlays	18.4	18.7	18.0	18.4	20.4	22.3	24.3	32.7
Discretionary	6.3	6.9	6.2	5.8	5.8	5.8	5.8	5.8
Mandatory	9.8	10.3	10.7	12.5	14.4	15.6	16.5	19.8
Social Security	4.2	4.2	4.4	5.4	6.3	6.4	6.4	6.9
Medicare	2.0	2.1	2.3	2.9	3.9	4.8	5.5	7.7
Medicaid	1.2	1.5	1.8	2.2	2.4	2.7	3.0	3.6
Other	2.4	2.4	2.3	2.0	1.8	1.7	1.6	1.5
Net Interest	2.3	1.6	1.1	0.1	0.2	0.9	2.0	7.1
Surplus or Deficit (-)	2.4	0.5	1.2	0.8	–1.1	–2.9	–4.8	–13.2
Primary Surplus or Deficit (-)	4.7	2.1	2.2	0.9	–0.9	–2.0	–2.8	–6.1
Federal Debt Held by the Public	35.0	29.2	19.1	2.9	4.4	20.9	46.5	165.2
Discretionary Spending Grows with Inflation								
Receipts	20.8	19.2	19.2	19.2	19.4	19.4	19.6	19.6
Outlays	18.4	18.7	18.0	17.6	18.3	18.7	19.0	22.5
Discretionary	6.3	6.9	6.2	5.1	4.3	3.7	3.1	2.1
Mandatory	9.8	10.3	10.7	12.5	14.5	15.6	16.5	19.9
Social Security	4.2	4.2	4.4	5.4	6.3	6.4	6.4	6.9
Medicare	2.0	2.1	2.3	2.9	3.9	4.8	5.5	7.7
Medicaid	1.2	1.5	1.8	2.2	2.4	2.7	3.0	3.6
Other	2.4	2.4	2.3	2.0	1.8	1.7	1.7	1.6
Net Interest	2.3	1.6	1.1	0.0	–0.5	–0.6	–0.6	0.5
Surplus or Deficit (-)	2.4	0.5	1.2	1.7	1.1	0.8	0.5	–2.9
Primary Surplus or Deficit (-)	4.7	2.1	2.2	1.7	0.6	0.2	–0.1	–2.4
Federal Debt Held by the Public	35.0	29.2	19.1	–0.5	–10.9	–13.9	–14.6	12.8

The Effects of Alternative Economic and Technical Assumptions. The results discussed above are sensitive to changes in underlying economic and technical assumptions. Some of the most important of these alternative economic and technical assumptions and their effects on the budget outlook are discussed below. Each highlights one of the key uncertainties in the outlook.

1. *Health Spending:* The long-range projections for Medicare follow the latest projections of the Medicare actuaries from the 2001 Medicare Trustees' Report. For many years, the Trustees' projections included a long-run slowdown in the rate of growth of real per capita Medicare spending. Recently, the Technical Review Panel on the Medicare Trustees' Reports recommended raising the long-run projected growth rate in real per capita Medicare costs, so that "age-and gender-adjusted, per-beneficiary spending growth exceeds the growth of per-capita GDP by 1 percentage point per year."[7] This assumption was adopted in the 2001 Medicare Trustees' Reports, and in Chart 3–5, real per capita Medicare benefits are assumed to rise at this rate. The effect of this change in assumptions on the Medicare HI trust fund's actuarial deficiency is shown in Table 3–3.

Eventually, the rising trend in health care costs for both Government and the private sector will have to end, but it is hard to know when and how that will happen. "Eventually" could be a long way off. Improved health and increased longevity are highly valued, and society may be willing to spend a larger share of income on them than it has heretofore. There are many reasonable alternative health cost and usage projections, as well as variations in the demographic projections to which they can be applied. Innovations in health care are proceeding rapidly, and they have diverse effects on the projection of costs. Likewise, the effects of greater longevity on Medicare and especially Medicaid costs are uncertain.

2. *Discretionary Spending:* The assumption used to project discretionary spending is essentially arbitrary, because discretionary spending is determined annually through the legislative process, and no formula can dictate future spending in the absence of legislation. Alternative assumptions have been made for discretionary spending. Holding discretionary spending unchanged in real terms is the "current services" assumption often used for budget projections when there is no legislative guidance on future spending levels. Alternatively, if discretionary spending is assumed to keep pace with the growth in GDP, spending increases in real terms whenever there is positive real economic growth.

Under the assumption that future spending expands with the size of the economy, these long-run budget projections show clearly that the budget is on an unsustainable path, although the shortfall unfolds only gradually. For most of the next two decades, the budget is projected to be in surplus, between 0 and 1-1/2 percent of GDP. In the following decade, the budget returns to deficit, and in the decade 2030–2039, the deficit begins to rise sharply. This is the time span within which the actuaries are now projecting that the Social Security trust funds will be exhausted. Timely action now could resolve these problems, without disrupting the retirement plans of future generations of workers.

[7] Technical Review Panel on the Medical Trustees' Reports, "Review of Assumptions and Methods of the Medicare Trustees' Financial Projections," December 2000.

3. *Productivity:* The future rate of productivity growth is perhaps the most powerful of the assumptions affecting the long-run budget outlook, and it is especially uncertain. Productivity in the U.S. economy slowed markedly and unexpectedly after 1973. This slowdown was responsible for a slower rise in U.S. real incomes for the next two decades which had many profound consequences for society. This slowdown in income growth also contributed to worsening Federal budget outcomes that followed 1973. In the latter half of the 1990s, however, productivity growth increased, unexpectedly again, although reasons for the revival are clear in hindsight.

Since the end of 1995, labor productivity in the economy's nonfarm business sector has grown at an annual rate of 2.4 percent, a full percentage point faster than the growth rate from 1973 through 1995, although the latest data, which were revised last summer, show that the trend growth rate remains about half a percentage point slower than from 1948 though 1973. So, productivity growth has rebounded, but it has not completely recovered from the post-1973 slowdown. On the other hand, while the latest downturn in the economy has cut into productivity growth, the underlying trend remains strong, which means there is reason to hope the improvement in productivity marks a permanent change.

The revival of productivity growth is one of the most welcome developments of the last several years. From a budgetary standpoint, a higher rate of economic growth makes the task of reaching a balanced budget much easier, while a lower productivity growth rate has the opposite effect. Although the long-run growth rate of productivity is inherently uncertain, it has averaged around 2 percent per year since 1947. In these extended projections, real GDP per hour is assumed to grow at 2.1 percent per year.

4. *Population:* The key assumptions underlying the long-run demographic projections concern fertility, immigration, and mortality.

- The demographic projections assume that fertility will average around 1.9 births per woman in the future, slightly below the replacement rate needed to maintain a constant population.
- The rate of immigration is assumed to average around 900,000 per year in these projections. Higher immigration relieves some of the pressure on population from low fertility and means that total population continues to expand throughout the projection period, although at a slower rate than historically.
- Mortality is projected to decline. The average female lifespan is projected to rise from 79.6 years to 85.0 years by 2075, and the average male lifespan is projected to increase from 74.0 years in 2001 to 80.9 years by 2075, and the gap between men's and women's expected lifespans narrows somewhat. A technical panel to the Social Security Trustees recently reported that the improvement in longevity might even be greater than this. If so, the projected growth of the three big entitlement programs would be even faster.

Conclusion.—Since the early 1990s, the long-run budget outlook has improved significantly, but it remains highly uncertain. Currently, there is an extended period of budget surpluses under most projection assumptions, but how big the surpluses will be and how long they will last remain quite uncertain. Furthermore, these surpluses eventually end under most assumptions. With pessimistic assumptions, the fiscal picture deteriorates relatively soon. More optimistic assumptions imply a longer period before the inexorable pressures of rising entitlement spending overwhelm the budget. Fundamental reforms are needed to preserve the basic promises embodied in Social Security and Medicare. Meanwhile, the wide range of possible outcomes highlights the sensitivity of these long-term projections to specific assumptions and cautions against undue reliance on any particular projection path. While actual experience with these projections is too short to have provided a meaningful track record to judge their accuracy, the shifts from one budget to the next in the featured projection path offer one indication of the wide range of variation in reasonable outcomes (see chart 3–4).

Actuarial Balance in the Social Security and Medicare Trust Funds:

The Trustees for the Social Security and Hospital Insurance trust funds issue annual reports that include projections of income and outgo for these funds over a 75-year period. These projections are based on different methods and assumptions than the long-run budget projections presented above, although the budget projections do rely on the Social Security assumptions for population growth and labor force growth after the year 2012. Despite these differences, the message is similar: The retirement of the baby-boom generation coupled with expected high rates of growth in per capita health care costs will exhaust the trust funds unless further remedial action is taken.

The Trustees' reports feature the 75-year actuarial balance of the trust funds as a summary measure of their financial status. For each trust fund, the balance is calculated as the change in receipts or program benefits (expressed as a percentage of taxable payroll) that would be needed to preserve a small positive balance in the trust fund at the end of 75 years. Table 3–3 shows the changes in the 75-year actuarial balances of the Social Security and Medicare HI trust funds from 2000 to 2001. There was virtually no change in the consolidated OASDI trust fund's projected deficiency. It narrowed slightly from –1.89 percent of payroll to

–1.86 percent. There was a large change in the actuarial balance of the HI trust fund.

The changes were due to revisions in the actuarial assumptions and to the annual shift in the valuation period, which arises because with the passage of time one more year of projected deficits has moved into the 75-year window. In the case of the OASDI funds, a small improvement in the economic assumptions was offset by the shift in the valuation period. For the HI program, the Trustees adopted the recommendation of their technical panel and increased the growth rate projected for the program's real per capita benefits. This change in assumptions brings projected future growth more in line with past patterns of growth, but if the new assumption is realized it will seriously undermine the program's long-term financial status.

Table 3–3. CHANGE IN 75-YEAR ACTUARIAL BALANCE FOR OASDI AND HI TRUST FUNDS (INTERMEDIATE ASSUMPTIONS)

(As percent of taxable payroll)

	OASI	DI	OASDI	HI
Actuarial balance in 2000 Trustees' Report	–1.53	–0.37	–1.89	–1.21
Changes in balance due to changes in:.				
Legislation	0.00	0.00	0.00	–0.03
Valuation period	–0.06	–0.01	–0.07	–0.04
Economic and demographic assumptions	0.10	0.01	0.11	0.08
Technical and other assumptions	–0.04	0.04	0.00	–0.77
Total Changes	–0.01	0.04	0.03	–0.76
Actuarial balance in 2001 Trustees' Report	–1.53	–0.33	–1.86	–1.97

PART III—NATIONAL WEALTH AND WELFARE

Unlike a private corporation, the Federal Government routinely invests in ways that do not add directly to its assets. For example, Federal grants are frequently used to fund capital projects by State or local governments for highways and other purposes. Such investments are valuable to the public, which pays for them with its taxes, but they are not owned by the Federal Government and would not show up on a conventional balance sheet for the Federal Government. It is true, of course, that by encouraging economic growth in the private sector, the Government augments future Federal tax receipts; when the private economy expands, the Government collects more taxes. However, if the investments funded, but not owned by the Federal Government, earn a conventional economic rate of return, the fraction of that return that comes back to the Government in higher taxes is far less than what a private investor would require before undertaking a similar investment.

The Federal Government also invests in education and research and development (R&D). These outlays contribute to future productivity and are analogous to an investment in physical capital. Indeed, economists have computed stocks of human and knowledge capital to reflect the accumulation of such investments. Nonetheless, such hypothetical capital stocks are obviously not owned by the Federal Government, nor would they appear on a typical balance sheet as a Government asset, even though these investments may contribute to future tax receipts.

To show the importance of these kinds of issues, Table 3–4 presents a national balance sheet. It includes estimates of national wealth classified into three categories: physical assets, education capital, and R&D capital. The Federal Government has made contributions to each of these categories of capital, and these contributions are shown separately in the table. Data in this table are especially uncertain, because of the strong assumptions needed to prepare the estimates.

The conclusion of the table is that Federal investments are responsible for about 7 percent of total national wealth. This may seem like a small fraction, but it represents a large volume of capital more than $5 trillion. The Federal contribution is down from around 9 percent in the mid-1980s, and from around 11 percent in 1960. Much of this reflects the shrinking size of defense capital stocks, which have declined from around 12 percent of GDP to 7 percent since the end of the Cold War.

Table 3–4. NATIONAL WEALTH

(As of the end of the fiscal year, in trillions of 2001 dollars)

	1960	1965	1970	1975	1980	1985	1990	1995	1999	2000	2001
ASSETS											
Publicly Owned Physical Assets:											
Structures and Equipment	2.0	2.3	2.8	3.5	3.6	3.9	4.2	4.7	5.1	5.3	5.2
Federally Owned or Financed	1.2	1.2	1.4	1.5	1.4	1.7	1.8	2.0	2.0	1.9	2.0
Federally Owned	1.0	1.0	1.1	1.0	0.9	1.0	1.1	1.1	1.0	1.0	1.0
Grants to State & Local Govt's	0.1	0.2	0.3	0.5	0.5	0.7	0.8	0.8	0.9	1.0	1.0
Funded by State & Local Govt's	0.9	1.1	1.5	2.0	2.2	2.1	2.4	2.7	3.2	3.3	3.2
Other Federal Assets	0.7	0.7	0.6	0.8	1.3	1.4	1.1	0.8	0.9	1.1	1.2
Subtotal	2.7	3.0	3.5	4.3	4.9	5.2	5.3	5.5	6.0	6.4	6.4
Privately Owned Physical Assets:											
Reproducible Assets	7.0	8.1	9.9	12.6	16.4	17.3	19.6	21.4	24.6	25.6	26.4
Residential Structures	2.7	3.2	3.7	4.8	6.6	6.8	7.7	8.6	10.1	10.5	11.0
Nonresidential Plant & Equipment	2.8	3.2	4.0	5.3	6.8	7.4	8.3	9.0	10.3	10.8	11.1
Inventories	0.6	0.7	0.8	1.1	1.3	1.2	1.3	1.4	1.5	1.5	1.4
Consumer Durables	0.9	1.0	1.3	1.5	1.7	1.9	2.3	2.4	2.7	2.8	2.9
Land	2.0	2.4	2.8	3.7	5.6	6.4	6.5	4.9	6.6	7.4	7.8
Subtotal	9.1	10.5	12.7	16.3	22.0	23.7	26.1	26.2	31.1	33.0	34.3
Education Capital:											
Federally Financed	0.1	0.1	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.1	1.2
Financed from Other Sources	6.1	7.8	10.6	13.1	17.1	20.4	26.3	29.0	35.1	36.6	37.9
Subtotal	6.2	7.9	10.8	13.4	17.5	21.0	27.1	29.8	36.2	37.7	39.1
Research and Development Capital:											
Federally Financed R&D:	0.2	0.3	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.0	1.0
R&D Financed from Other Sources	0.1	0.2	0.3	0.4	0.5	0.7	0.9	1.1	1.4	1.5	1.4
Subtotal	0.3	0.5	0.8	0.9	1.1	1.3	1.7	2.0	2.4	2.5	2.4
Total Assets	18.3	21.9	27.8	34.9	45.5	51.3	60.2	63.6	75.7	79.5	82.1
Net Claims of Foreigners on U.S. (+)	–0.1	–0.2	–0.2	–0.1	–0.4	0.0	0.8	1.5	3.5	3.5	3.5
Net Wealth	18.4	22.1	27.9	35.0	45.8	51.2	59.4	62.0	72.2	76.0	78.6
ADDENDA:.											
Per Capita Wealth (thousands of dollars)	101.9	114.0	136.4	162.4	200.9	214.5	237.1	232.5	258.3	268.6	274.6
Ratio of Wealth to GDP (in percent)	703.3	715.3	695.0	695.6	678.8	673.6	662.6	682.8	677.3	689.1	711.2
Total Federally Funded Capital (trillions 2001 $)	2.1	2.4	2.7	3.2	3.7	4.3	4.5	4.5	4.9	5.1	5.3
Percent of National Wealth	11.4	10.7	9.8	9.1	8.1	8.5	7.6	7.3	6.8	6.8	6.7

Physical Assets:

The physical assets in the table include stocks of plant and equipment, office buildings, residential structures, land, and the Government's physical assets such as military hardware and highways. Automobiles and consumer appliances are also included in this category. The total amount of such capital is vast, around $41 trillion in 2001, consisting of $34 trillion in private physical capital and $6 trillion in public physical capital; by comparison, GDP was about 10 trillion in 2001.

The Federal Government's contribution to this stock of capital includes its own physical assets plus $1.1 trillion in accumulated grants to State and local Governments for capital projects. The Federal Government has financed about one-fourth of the physical capital held by other levels of Government.

Education Capital:

Economists have developed the concept of human capital to reflect the notion that individuals and society invest in people as well as in physical assets. Investment in education is a good example of how human capital is accumulated.

This table includes an estimate of the stock of capital represented by the Nation's investment in formal education and training. The estimate is based on the cost of replacing the years of schooling embodied in the U.S. population aged 16 and over; in other words, the idea is to measure how much it would cost to reeducate the U.S. workforce at today's prices (rather than at its original cost). This is more meaningful economically than the historical cost, and is comparable to the measures of physical capital presented earlier.

Although this is a relatively crude measure, it does provide a rough order of magnitude for the current value of the investment in education. According to this measure, the stock of education capital amounted to $39 trillion in 2001, of which about 3 percent was financed by the Federal Government. It is nearly equal to the total value of the Nation's stock of physical capital. The main investors in education capital have been State and local governments, parents, and students themselves (who forgo earning opportunities in order to acquire education).

Even broader concepts of human capital have been proposed. Not all useful training occurs in a schoolroom or in formal training programs at work. Much informal learning occurs within families or on the job, but measuring its value is very difficult. However, labor compensation amounts to about two-thirds of national in-

come, and thinking of this income as the product of human capital suggests that the total value of human capital might be two times the estimated value of physical capital. Thus, the estimates offered here are in a sense conservative, because they reflect only the costs of acquiring formal education and training, which is why they are referred to as education capital rather than human capital. They are that part of human capital that can be attributed to formal education and training.

Research and Development Capital:

Research and Development can also be thought of as an investment, because R&D represents a current expenditure that is made in the expectation of earning a future return. After adjusting for depreciation, the flow of R&D investment can be added up to provide an estimate of the current R&D stock.[8] That stock is estimated to have been about $2–1/2 trillion in 2001. Although this represents a large amount of research, it is a relatively small portion of total National wealth. Of this stock, about 40 percent was funded by the Federal Government.

Liabilities:

When considering how much the United States owes as a Nation, the debts that Americans owe to one another cancel out. In most cases, the debts of one American are the assets of another American, so in these cases, the debts are not included in Table 3–4 because they are not a net liability of Americans as a Nation. Table 3–4 is intended to show National totals only, but that does not mean that the level of debt is unimportant. The amount of debt owed by Americans to other Americans can exert both positive and negative effects on the economy. American's willingness to borrow helped fuel the expansion of the 1990s, but the debts accumulated in this process must be serviced, which could lead to curtailed spending at some future point. Moreover, bad debts, which are not collectible, can cause serious problems for the banking system. While the banking system appears to be financially sound, such uncollectible debts were a serious problem hampering the opening stages of the last economic expansion in 1991–1992. Despite these considerations, the only debts that appear in Table 3–4 are the debts Americans owe to foreign investors. America's foreign debt has been increasing rapidly in recent years, because of the rising deficit in the U.S. current account. Although the current account deficit has been at record levels recently, the size of this debt remains small compared with the total stock of U.S. assets. It amounted to 3–1/2 percent of total assets in 2001.

Federal debt does not appear explicitly in Table 3–4 because much of it is held by Americans; only that portion of the Federal debt held by foreigners is included with other debt to foreigners. Comparing the Federal Government's net liabilities with total national wealth does, however, provide another indication of the relative magnitude of the imbalance in the Government's accounts. Currently, Federal net liabilities, as reported in Table 3–1, amount to about 4 percent of net U.S. wealth as shown in Table 3–4.

[8] R&D depreciates in the sense that the economic value of applied research and development tends to decline with the passage of time, as still newer ideas move the technological frontier.

Trends in National Wealth

The net stock of wealth in the United States at the end of FY 2001 was about $78–1/2 trillion, almost eight times the level of GDP. Since 1981, it has increased in real terms at an average annual rate of 2.6 percent per year—two percentage points less rapidly than it grew from 1961 to 1981—4.7 percent per year. Public physical capital formation growth slowed even more. Since 1981, public physical capital has increased at an annual rate of only 1.0 percent, compared with 3.3 percent over the previous 20 years.

The net stock of private nonresidential plant and equipment grew 2.3 percent per year from 1981 to 2001, compared with 4.6 percent in the 1960s and 1970s; and the stock of business inventories increased even less, just 0.4 percent per year on average since 1981. However, private nonresidential fixed capital has increased much more rapidly since 1995—3.8 percent per year—reflecting the investment boom in the latter half of the 1990s.

The accumulation of education capital, as measured here, has also slowed down since 1981, but not as much. It grew at an average rate of 5.3 percent per year in the 1960s and 1970s, about 0.9 percentage point faster than the average rate of growth in private physical capital during the same period. Since 1981, education capital has grown at a 3.9 percent annual rate. This reflects both the extra resources devoted to schooling in this period, and the fact that such resources were increasing in economic value. R&D stocks have also grown at about 3.9 percent per year since 1981.

Other Federal Influences on Economic Growth

Federal investment decisions, as reflected in Table 3–4, obviously are important, but the Federal Government also contributes to wealth in ways that cannot be easily captured in a formal presentation. The Federal Reserve's monetary policy affects the rate and direction of capital formation in the short run, and Federal regulatory and tax policies also affect how capital is invested, as do the Federal Government's policies on credit assistance and insurance.

Social Indicators

There are certain broad responsibilities that are unique to the Federal Government. Especially important are fostering healthy economic conditions including sound economic growth, promoting health and social welfare, and protecting the environment. Table 3–5 offers a rough cut of information that can be useful in assessing how well the Federal Government has been doing in promoting these general objectives.

The indicators shown here are a limited subset drawn from the vast array of available data on conditions in

Table 3–5. ECONOMIC AND SOCIAL INDICATORS

General categories	Specific measures	1960	1965	1970	1975	1980	1985	1990	1995	1999	2000	2001
Economic:												
Living Standards	Real GDP per person (1996 dollars)	$13,145	$15,587	$17,445	$18,909	$21,523	$23,971	$26,832	$28,318	$31,732	$32,651	$32,572
	average annual percent change (5-year trend)	0.7	3.5	2.3	1.6	2.6	2.2	2.3	1.1	2.6	2.9	2.4
	Median Income (2000 dollars):											
	All Households	N/A	N/A	$33,746	$33,489	$35,238	$36,246	$38,446	$38,262	$42,187	$42,148	N/A
	Married Couple Families	$29,111	$33,881	$40,631	$42,193	$46,045	$47,728	$51,224	$52,843	$58,580	$59,187	N/A
	Female Householder, Husband Absent	$14,712	$16,472	$19,678	$19,423	$20,709	$20,964	$21,740	$22,110	$24,529	$25,787	N/A
	Income Share of Lower 60% of All Families	34.8	35.2	35.2	35.2	34.5	32.7	32.0	30.3	29.8	29.6	N/A
	Poverty Rate (%) (a)	22.2	17.3	12.6	12.3	13.0	14.0	13.5	13.8	11.8	11.3	N/A
Economic Security	Civilian Unemployment (%)	5.5	4.5	4.9	8.5	7.1	7.2	5.5	5.6	4.2	4.0	4.8
	CPI-U (% Change)	1.7	1.6	5.8	9.1	13.5	3.5	5.4	2.8	2.1	3.4	2.9
Employment	Increase in Total Payroll Employment Previous 12 Months.	–0.5	2.9	–0.5	0.4	0.2	2.5	0.3	2.2	3.1	2.0	–1.1
	Managerial or Professional Jobs (% of civilian employment)	N/A	N/A	N/A	N/A	N/A	24.1	25.8	28.3	30.3	30.2	31.0
Wealth Creation	Net National Saving Rate (% of GDP)	10.2	12.1	8.2	6.6	7.5	6.1	4.6	4.7	6.0	5.6	4.0
Innovation	Patents Issued to U.S. Residents (thousands)	42.3	54.1	50.6	51.5	41.7	45.1	56.1	68.2	99.5	103.6	N/A
	Multifactor Productivity (average annual percent change)	0.8	2.8	0.8	1.1	0.8	0.6	0.5	0.6	1.0	N/A	N/A
Environment:.												
Air Quality	Nitrogen Oxide Emissions (thousand short tons)	14,140	16,579	20,928	22,632	24,384	23,198	24,170	25,051	25,393	N/A	N/A
	Sulfur Dioxide Emissions (thousand short tons)	22,227	26,750	31,161	28,011	25,905	23,658	23,678	19,188	18,867	N/A	N/A
	Lead Emissions (thousand short tons)	N/A	N/A	221	160	74	23	4	4	4	N/A	N/A
Water Quality	Population Served by Secondary Treatment or Better (mils)	N/A	N/A	N/A	N/A	N/A	134	155	166	N/A	N/A	N/A
Social:												
Families	Children Living with Mother Only (% of all children)	9.2	10.2	11.6	16.4	18.6	20.2	21.6	24.0	22.4	21.7	N/A
Safe Communities	Violent Crime Rate (per 100,000 population) (b)	160	199	364	482	597	557	732	685	523	506	N/A
	Murder Rate (per 100,000 population) (b)	5	5	8	10	10	8	9	8	6	6	N/A
	Murders (per 100,000 Persons Age 14 to 17)	N/A	N/A	N/A	5	6	5	10	11	6	N/A	N/A
Health	Infant Mortality (per 1000 Live Births)	26.0	24.7	20.0	16.1	12.6	10.6	9.2	7.6	7.1	6.9	N/A
	Low Birthweight [<2,500 gms] Babies (%)	7.7	8.3	7.9	7.4	6.8	6.8	7.0	7.3	7.6	7.6	N/A
	Life Expectancy at birth (years)	69.7	70.2	70.8	72.6	73.7	74.7	75.4	75.8	76.7	76.9	N/A
	Cigarette Smokers (% population 18 and older)	N/A	41.9	39.2	36.3	33.0	29.9	25.3	24.6	23.3	N/A	N/A
Learning	High School Graduates (% of population 25 and older)	44.6	49.0	55.2	62.5	68.6	73.9	77.6	81.7	83.4	N/A	N/A
	College Graduates (% of population 25 and older)	8.4	9.4	11.0	13.9	17.0	19.4	21.3	23.0	25.2	N/A	N/A
	National Assessment of Educational Progress (c)											
	Mathematics High School Seniors	N/A	N/A	N/A	302	299	301	305	307	308	N/A	N/A
	Science High School Seniors	N/A	N/A	305	293	286	288	290	295	295	N/A	N/A
Participation	Individual Charitable Giving per Capita (2000 dollars)	231	277	333	353	385	396	439	416	553	554	N/A
	(by presidential election year)	(1960)	(1964)	(1968)	(1972)	(1976)	(1980)	(1984)	(1988)	(1992)	(1996)	(2000)
	Voting for President (% eligible population)	62.8	61.9	60.9	55.2	53.5	52.8	53.3	50.3	55.1	49.0	51.2

N/A = Not Available.

(a) The poverty rate does not reflect noncash government transfers such as Medicaid or food stamps.

(b) Not all crimes are reported, and the fraction that go unreported may have varied over time, 2000 data are preliminary.

(c) Some data from the national educational assessments have been interpolated.

the United States. In choosing indicators for this table, priority was given to measures that were consistently available over an extended period. Such indicators make it easier to draw valid comparisons and evaluate trends. In some cases, however, this meant choosing indicators with significant limitations.

The individual measures in this table are influenced to varying degrees by many Government policies and programs, as well as by external factors beyond the Government's control. They do not measure the outcomes of Government policies, because they generally do not show the direct results of Government activities, but they do provide a quantitative measure of the progress or lack of progress in reaching some of the ultimate values that Government policy is intended to promote.

Such a table can serve two functions. First, it highlights areas where the Federal Government might need to modify its current practices or consider new approaches. Where there are clear signs of deteriorating conditions, corrective action might be appropriate. Second, the table provides a context for evaluating other data on Government activities. For example, Government actions that weaken its own financial position may be appropriate when they promote a broader social objective. The Government cannot avoid making such trade-offs because of its size and the broad ranging effects of its actions. Monitoring these effects and incorporating them in the Government's policy making is a major challenge.

It is worth noting that, in recent years, many of the trends in these indicators turned around. The improvement in economic conditions has been widely noted, and there have also been some significant social improvements. Perhaps, most notable has been the turnaround in the crime rate. Since reaching a peak

in the early 1990s, the violent crime rate has fallen by a third. The turnaround has been especially dramatic in the murder rate, which was lower in 2000 than at any time since the 1960s. The recession that began in March 2001 is having an effect on some of these indicators already, and could affect others when data become available later this year. Unemployment has risen and real GDP growth has declined. But if the recession is brief, which is the expectation for this budget, much of the improvement shown in Table 3–5 is likely to be preserved.

An Interactive Analytical Framework

No single framework can encompass all of the factors that affect the financial condition of the Federal Government. Nor can any framework serve as a substitute for actual analysis. Nevertheless, the framework presented here offers a useful way to examine the financial aspects of Federal policies. Increased Federal support for investment, the promotion of national saving through fiscal policy, and other Administration policies to enhance economic growth are expected to promote national wealth and improve the future financial condition of the Federal Government. As that occurs, the efforts will be revealed in these tables.

TECHNICAL NOTE: SOURCES OF DATA AND METHOD OF ESTIMATING

Federally Owned Assets and Liabilities

Assets:

Financial Assets: The source of data is the Federal Reserve Board's Flow-of-Funds Accounts.

Physical Assets:

Fixed Reproducible Capital: Estimates were developed from the OMB historical data base for physical capital outlays and software purchases. The data base extends back to 1940 and was supplemented by data from other selected sources for 1915–1939. The source data are in current dollars. To estimate investment flows in constant dollars, it was necessary to deflate the nominal investment series. This was done using price deflators for Federal investment from the National Income and Product Accounts.

Fixed Nonreproducible Capital: Historical estimates for 1960–1985 were based on estimates in Michael J. Boskin, Marc S. Robinson, and Alan M. Huber, "Government Saving, Capital Formation and Wealth in the United States, 1947–1985," published in The Measurement of Saving, Investment, and Wealth, edited by Robert E. Lipsey and Helen Stone Tice (The University of Chicago Press, 1989).

Estimates were updated using changes in the value of private land from the Flow-of-Funds Balance Sheets and from the Agriculture Department for farm land; the value of Federal oil deposits was extrapolated using the Producer Price Index for Crude Energy Materials.

Liabilities:

Financial Liabilities: The principal source of data is the Federal Reserve's Flow-of-Funds Accounts.

Insurance Liabilities: Sources of data are the OMB Pension Guarantee Model and OMB estimates based on program data. Historical data on liabilities for deposit insurance were also drawn from CBO's study, The Economic Effects of the Savings and Loan Crisis, issued January 1992.

Pension Liabilities: For 1979–1998, the estimates are the actuarial accrued liabilities as reported in the annual reports for the Civil Service Retirement System, the Federal Employees Retirement System, and the Military Retirement System (adjusted for inflation). Estimates for the years before 1979 are extrapolations. The estimate for 2001 is a projection. The health insurance liability was estimated by the program actuaries for 1997–2001, and extrapolated back for earlier years.

Long-Run Budget Projections

The long-run budget projections are based on long-run demographic and economic assumptions. A simplified model of the Federal budget, developed at OMB, computes the budgetary implications of these projections.

Demographic and Economic Projections: For the years 2002–2012, the assumptions are identical to those used in the budget. These budget assumptions reflect the President's policy proposals. The economic assumptions in the budget are extended by holding constant inflation, interest rates, and unemployment at the levels assumed in the final year of the budget. Population growth and labor force growth are extended using the intermediate assumptions from the 2001 Social Security Trustees' report. The projected rate of growth for real GDP is built up from the labor force assumptions and an assumed rate of productivity growth. The assumed rate of productivity growth is held constant at the average rate of growth implied by the budget's economic assumptions.

Budget Projections: Beyond the budget horizon, receipts are projected using simple rules of thumb linking income taxes, payroll taxes, excise taxes, and other receipts to projected tax bases derived from the economic forecast. Outlays are computed in different ways. Discretionary spending is projected to grow at the rate of inflation or at the rate of growth in nominal GDP. Social Security is projected by the Social Security actuaries using these long-range assumptions. Federal pensions are derived from the most recent actuarial forecasts available at the time the budget is prepared, repriced using Administration inflation assumptions. Medicaid outlays are based on the economic and demographic projections in the model. Medicare projections follow the latest Medicare Trustees' reports adjusted for the Administration's different inflation and real growth assumptions. Other entitlement programs are projected based on rules of thumb linking program

spending to elements of the economic and demographic forecast such as the poverty rate.

National Balance Sheet Data

Publicly Owned Physical Assets: Basic sources of data for the Federally owned or financed stocks of capital are the Federal investment flows described in Chapter 7. Federal grants for State and local Government capital are added, together with adjustments for inflation and depreciation in the same way as described above for direct Federal investment. Data for total State and local Government capital come from the revised capital stock data prepared by the Bureau of Economic Analysis extrapolated for 2001.

Privately Owned Physical Assets: Data are from the Flow-of-Funds national balance sheets and from the private net capital stock estimates prepared by the Bureau of Economic Analysis extrapolated for 2001 using investment data from the National Income and Product Accounts.

Education Capital: The stock of education capital is computed by valuing the cost of replacing the total years of education embodied in the U.S. population 16 years of age and older at the current cost of providing schooling. The estimated cost includes both direct expenditures in the private and public sectors and an estimate of students' forgone earnings, i.e., it reflects the opportunity cost of education. Estimates of students' forgone earnings are based on the year-round, full-time earnings of 18–24 year olds with selected educational attainment levels. These year-round earnings are reduced by 25 percent because students are usually out of school three months of the year. For high school students, these adjusted earnings are further reduced by the unemployment rate for 16–17 year olds; for college students, by the unemployment rate for 20–24 year olds. Yearly earnings by age and educational attainment are from *Money Income in the United States,* series P60, published by the Bureau of the Census.

For this presentation, Federal investment in education capital is a portion of the Federal outlays included in the conduct of education and training. This portion includes direct Federal outlays and grants for elementary, secondary, and vocational education and for higher education. The data exclude Federal outlays for physical capital at educational institutions because these outlays are classified elsewhere as investment in physical capital. The data also exclude outlays under the GI Bill; outlays for graduate and post-graduate education spending in HHS, Defense and Agriculture; and most outlays for vocational training.

Data on investment in education financed from other sources come from educational institution reports on the sources of their funds, published in U.S. Department of Education, *Digest of Education Statistics.* Nominal expenditures were deflated by the implicit price deflator for GDP to convert them to constant dollar values. Education capital is assumed not to depreciate, but to be retired when a person dies. An education capital stock computed using this method with different source data can be found in Walter McMahon, "Relative Returns To Human and Physical Capital in the U.S. and Efficient Investment Strategies," *Economics of Education Review,* Vol. 10, No. 4, 1991. The method is described in detail in Walter McMahon, *Investment in Higher Education,* Lexington Books, 1974.

Research and Development Capital: The stock of R&D capital financed by the Federal Government was developed from a data base that measures the conduct of R&D. The data exclude Federal outlays for physical capital used in R&D because such outlays are classified elsewhere as investment in federally financed physical capital. Nominal outlays were deflated using the GDP price index to convert them to constant dollar values.

Federally funded capital stock estimates were prepared using the perpetual inventory method in which annual investment flows are cumulated to arrive at a capital stock. This stock was adjusted for depreciation by assuming an annual rate of depreciation of 10 percent on the estimated stock of applied research and development. Basic research is assumed not to depreciate. Chapter 7 of this volume contains additional details on the estimates of the total federally financed R&D stock, as well as its national defense and nondefense components.

A similar method was used to estimate the stock of R&D capital financed from sources other than the Federal Government. The component financed by universities, colleges, and other nonprofit organizations is estimated based on data from the National Science Foundation, *Surveys of Science Resources.* The industry-financed R&D stock component is estimated from that source and from the U.S. Department of Labor, *The Impact of Research and Development on Productivity Growth,* Bulletin 2331, September 1989.

Experimental estimates of R&D capital stocks have recently been prepared by BEA. The results are described in "A Satellite Account for Research and Development," *Survey of Current Business,* November 1994. These BEA estimates are lower than those presented here primarily because BEA assumes that the stock of basic research depreciates, while the estimates in Table 3–4 assume that basic research does not depreciate. BEA also assumes a slightly higher rate of depreciation for applied research and development, 11 percent, compared with the 10 percent rate used here.

Social Indicators

The main sources for the data in this table are the Government statistical agencies. The data are all publicly available, and can be found in such general sources as the annual *Economic Report of the President* and the *Statistical Abstract of the United States,* or from agencies' Web sites.