3. STEWARDSHIP

Introduction

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 enough information to evaluate fully the government's financial and investment decisions. Indeed, changes in the annual budget deficit or surplus can be misleading indicators of the government's financial condition. For example, the temporary shift from annual deficit to surplus in the late 1990s did nothing to correct the long-term deficiencies in the nation's major entitlement programs, which are the major source of the long-run shortfall in federal finances. This would have been more apparent if greater attention had focused on long-term measures such as appear in this chapter. As important as the budget surplus or deficit is, it should not be the only indicator used to judge the government's fiscal condition.

While a private business may ultimately be judged by a single number—the bottom line in its balance sheet—the national government is ultimately judged on how its actions affect the country, and that is not possible to sum up with a single statistic. The government is not expected to earn a profit. Instead, its fiscal condition can only be properly evaluated using a broad range of data and several complementary perspectives. This chapter presents a framework for such analysis. Because there are serious limitations on the available data and the future is uncertain, this chapter's findings should be interpreted with caution; its conclusions are tentative and subject to future revision.

The chapter consists of four parts:

- Part I presents the government's physical and financial assets and its legal liabilities summarized in Table 3–1. This table corresponds most closely to a business balance sheet, but it misses some of the government's unique fiscal characteristics. That is why it needs to be supplemented by the information in Parts II and III. The government's net liabilities in Table 3–1 are dwarfed by its unfunded obligations as presented in Part II.
- Part II broadens the scope to evaluate the government's long-run financial burdens and the resources available to meet them. It presents possible paths for the federal budget that extend far beyond the normal budget window and describes how these projections vary depending on key economic and demographic assumptions. The projections are summarized in Table 3–2. This part also presents discounted present value estimates of the funding shortfall in Social Security and Medicare in Table 3–3.
- Part III features information on national economic and social conditions which are affected by what the government does. The private economy is the ultimate source of the resources the government will have to draw upon to meet future obligations. 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.
- Part IV concludes the chapter and explains how the separate pieces of analysis link together. Chart 3–8 presents the linkages in a schematic diagram.

The government's legally binding obligations—its liabilities—consist mainly of Treasury debt and the pensions plus retiree health benefits owed to federal employees, which are a form of deferred compensation. These obligations have counterparts in the business world, and would appear as liabilities 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. These obligations, however, are only a subset of the government's total financial responsibilities. Indeed, the full extent of the government's fiscal exposure through its various programmatic commitments dwarfs the outstanding debt held by the public or the balance between federal liabilities and assets. The commitment to Social Security and Medicare alone amounts to several times the value of outstanding federal debt or the net balance of government liabilities less assets shown in Table 3–1.

The government has a broad range of programs that dispense cash and other benefits to individual recipients and it also provides a wide range of other public services that must be financed through the tax system. The government is not constitutionally obligated, except in the most general terms, to continue operating these programs, and the benefits and services could be modified or even ended at any time, subject to the decisions of the Congress and the President. Such changes are a regular part of the legislative cycle. These programmatic commitments cannot be thought of as "liabilities" in a legal or accounting sense, but they will remain federal responsibilities for the foreseeable future, and they are included in the long-run projections presented in Part II; it would be misleading to leave out these programmatic commitments in projecting future claims on the government or calculating the government's long-run fiscal balance. It is true, of course, that the federal government also has resources that

go beyond the assets that would normally appear on a balance sheet. These additional resources include the government's sovereign power to tax. For this reason, the best way to analyze the future strains on the government's fiscal position is to make a long-run projection of the entire federal budget, as is done in Part II of this chapter, which provides a comprehensive measure of the government's future cash flows.

Over long periods of time, government spending must be financed by the taxes and other receipts it collects. Although the government can borrow for temporary periods, it must pay interest on any such borrowing, which adds to future spending. In the long run, a solvent government must pay for its spending out of its receipts. The projections in Part II show that under an extension of the estimates in this budget, long-run balance in this sense is not achieved, mostly because of large deficiencies in Social Security and Medicare.

The long run budget projections and the table of assets and liabilities 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 those points requires performance measures for government programs supplemented by appropriate information about conditions in the economy and society. Recent changes in budgeting practices should contribute to the goal of more complete information about government programs and permit a closer alignment of the cost of programs with performance measures. These changes are described in detail in the main Budget volume, in chapter 1 of this volume, and in the accompanying volume that describes the creation of the Program Assessment Rating Tool (PART). This chapter complements the detailed exploration of government performance with an assessment of the overall impact of Federal policy as reflected in some general measures of economic and social well-being.

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 fovernment 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.

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 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; a 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 or that of its owners. 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 exceed the estimated value of the assets the federal government actually owns. The government, however, 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 operation even though the government's current assets are less than its current liabilities.

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

The financial markets clearly recognize this reality. The federal government's implicit credit rating is the best in the world; 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 are Social Security and Medicare not shown as government liabilities?

Future Social Security and Medicare benefits may be considered as promises or obligations, but these benefits are not a liability in the usual sense. The government has unilaterally decreased as well as increased these benefits in the past, and future reforms could alter them again. The size of these promises is shown in this chapter in two ways: Budget projections as a percent of GDP from now through 2080, and the actuarial deficiency estimates over roughly the same period.

Other Federal programs exist that are similar to Social Security and Medicare in the promises they make—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 or Medicare were to be classified as a liability. There is no bright line dividing Social Security and Medicare from other programs that promise benefits, and all the government programs that do so should be accounted for similarly. In the long-range budget projections, the entire budget is counted as it is in estimating the government's total fiscal imbalance.

Furthermore, if future Social Security or Medicare benefits were to be treated as a liability, then future payroll tax receipts earmarked to finance those benefits ought to be treated as a government asset. Tax receipts, however, are not generally considered government assets, and for good reason: the government does not own the wealth on which future taxes depends. Including taxes on the government's balance sheet would be incorrect, but treating taxes for Social Security or Medicare differently from other taxes would be highly questionable.

Finally, under Generally Accepted Accounting Principles (GAAP), Social Security is not considered to be a liability, so not counting it as such in this chapter is consistent with proper accounting standards.

4. Why can't the government 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 government does not have a "bottom line" comparable to that of a business corporation, but 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 many of 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 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. In short, the federal government does follow generally accepted accounting principles (GAAP) just as businesses and state and local governments do for their activities, although the relevant principles differ depending on the circumstances. 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 trade-offs and connections between making the federal government "better off" and making the nation "better off."

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

5. When the baby-boom generation begins to retire in large numbers beginning within the next ten years, the deficit could become much 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. Both the long-range budget projections and the actuarial projections presented in this chapter indicate how serious the problem is. It is clear from this information that reforms are needed in these programs to meet the long-term challenges. The need for reforms in these programs are discussed further in the chapter "The Real Fiscal Danger" in the main Budget volume.

6. Would it make sense 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 the government does 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 has even been negative in some years, so little if any 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 today 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 assets owned by the federal government, 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 appropriate level of the surplus or deficit.

PART I—THE FEDERAL GOVERNMENT'S ASSETS AND LIABILITIES

Table 3–1 takes a backward look at the government's assets and liabilities summarizing what the government owes as a result of its past operations netted against the value of what it owns. The table gives some perspective by showing this balance for a number of years beginning in 1960. The assets and liabilities are measured in terms of constant FY 2002 dollars. Government liabilities have exceeded the value of assets (see chart 3–1) over this entire period, but 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. When those prices subsequently declined, Fed-

Table 3–1. GOVERNMENT ASSETS AND LIABILITIES*

(As of the end of the fiscal year, in billions of 2002 dollars)

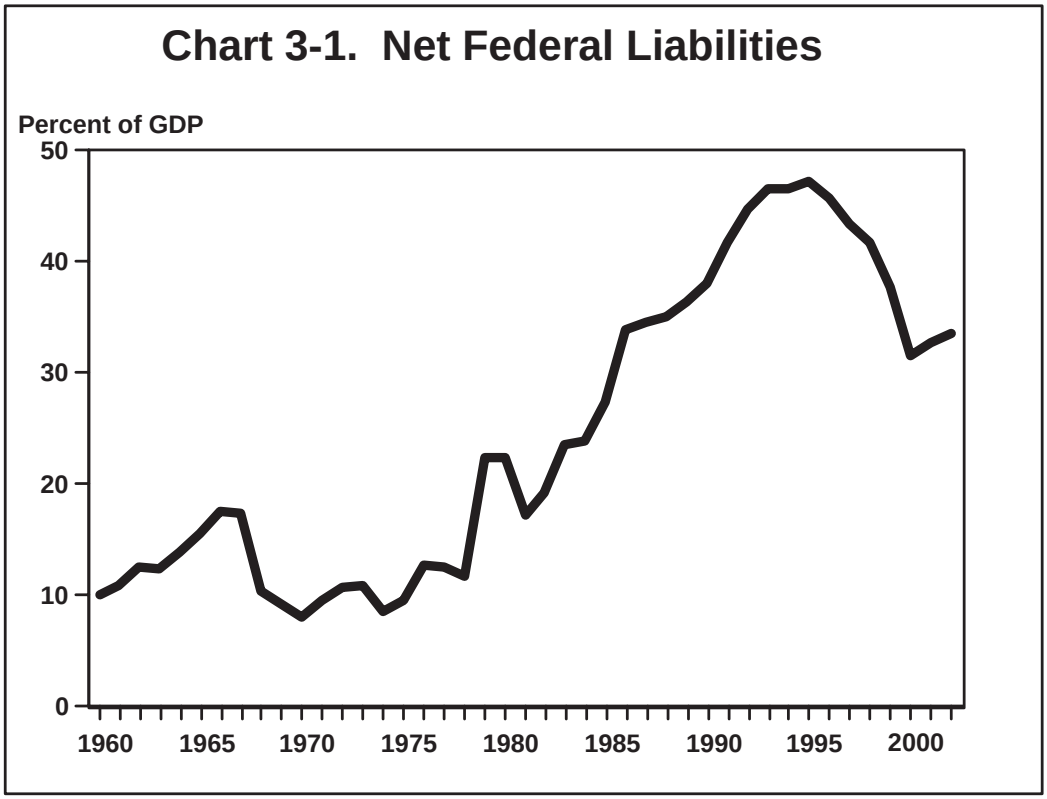
	1960	1965	1970	1975	1980	1985	1990	1995	2000	2001	2002
ASSETS											
Financial Assets:											
Cash and Checking Deposits	43	63	39	32	48	32	43	44	58	51	78
Other Monetary Assets	1	1	1	1	2	2	2	1	6	12	18
Mortgages	28	27	40	42	78	79	101	69	79	76	75
Other Loans	103	142	178	178	227	298	211	165	192	196	202
less Expected Loan Losses	–1	–3	–5	–9	–18	–17	–20	–25	–38	–38	–38
Other Treasury Financial Assets	62	78	68	62	87	128	203	243	221	235	258
Total	237	308	321	305	424	521	539	497	518	531	592
Nonfinancial Assets:											
Fixed Reproducible Capital	1,028	1,029	1,076	982	953	1,093	1,149	1,142	1,002	990	997
Defense	893	849	859	719	661	786	823	793	642	621	616
Nondefense	135	180	217	263	291	307	326	349	360	369	381
Inventories	271	235	219	196	242	276	244	187	191	185	188
Nonreproducible Capital	437	449	431	638	1,023	1,098	864	652	962	1,022	995
Land	95	132	166	263	335	349	358	276	414	435	485
Mineral Rights	343	318	265	376	687	749	506	376	548	587	509
Subtotal	1,737	1,714	1,726	1,816	2,217	2,467	2,256	1,981	2,155	2,197	2,179
Total Assets	1,974	2,021	2,047	2,121	2,641	2,988	2,796	2,478	2,673	2,728	2,772
LIABILITIES											
Financial Liabilities:											
Debt held by the Public	1,184	1,218	1,084	1,103	1,369	2,260	3,071	4,061	3,526	3,345	3,540
Trade Payables and Miscellaneous	34	38	45	59	85	111	162	133	101	92	85
Subtotal	1,218	1,256	1,129	1,162	1,454	2,372	3,232	4,194	3,627	3,437	3,625
Insurance Liabilities:											
Deposit Insurance	0	0	0	0	2	9	74	5	1	3	2
Pension Benefit Guarantee [1]	0	0	0	45	33	45	45	21	42	51	81
Loan Guarantees	0	0	2	7	13	11	16	30	38	39	39
Other Insurance	32	29	23	21	28	17	21	18	17	16	16
Subtotal	32	30	25	72	75	82	155	75	98	110	138
Federal Pension and Retiree Health Liabilities											
Pension Liabilities	817	1,027	977	1,063	1,872	1,855	1,807	1,744	1,772	1,727	1,752
Retiree Health Insurance Benefits	196	246	234	255	449	445	433	418	398	792	807
Total	1,013	1,273	1,212	1,318	2,321	2,299	2,241	2,162	2,169	2,519	2,560
Total Liabilities	**2,264**	**2,558**	**2,366**	**2,553**	**3,850**	**4,754**	**5,628**	**6,431**	**5,894**	**6,065**	**6,323**
Balance	**–290**	**–537**	**–319**	**–431**	**–1,209**	**–1,766**	**–2,833**	**–3,953**	**–3,221**	**–3,337**	**–3,531**
Addenda:											
Balance Per Capita (in 2002 dollars)	**–1,607**	**–2,766**	**–1,557**	**–2,000**	**–5,299**	**–7,393**	**–11,316**	**–14,822**	**–11,401**	**–11,702**	**–12,340**
Ratio to GDP (in percent)	**–11.0**	**–16.2**	**–8.1**	**–9.6**	**–22.5**	**–27.7**	**–38.1**	**–47.2**	**–31.5**	**–32.8**	**–33.8**

* 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.

eral asset values declined and only recently have they regained the level they had reached temporarily in the early 1980s.

Currently, the total real value of federal assets is estimated to be 40 percent greater than it was in 1960. Meanwhile, federal liabilities have increased by 179 percent in real terms. The decline in the federal net asset position has been principally due to persistent federal budget deficits, 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 $3.6 trillion, or approximately $12,000 per capita, compared with net liabilities of $4.0 trillion (2002 dollars) and almost $15,000 per capita (2002 dollars) in 1995.



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 $0.6 trillion at the end of FY 2002. Government-held mortgages and other loans (measured in constant dollars) reached a peak in the early 1990s as the government acquired mortgages from failed savings and loan institutions. The government has liquidated most of the mortgages it acquired from bankrupt savings and loans in the 1990s, but since that process was completed federal mortgage holdings have begun to increase again.

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 $40 billion as of 2002. 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 in constant dollars 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, about 60 percent 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 2-½ 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, many 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. They declined sharply in 1997–1998, rebounded in 1999–2000, fell again in 2001, and rose in 2002. These fluctuations have caused the estimated value of federal mineral deposits to fluctuate as well. (These estimates also omit some valuable assets owned by the federal government, such as works of art and historical artifacts, because there is no realistic basis for valuing them, and because, as part of

the nation's historical heritage, these objects are never likely to be sold.)

Total Assets: The total value of government assets measured in constant dollars is lower now than it was in the 1980s, mainly because of declines in defense capital and inventories in the late 1990s following the end of the Cold War. Government asset values have risen strongly since 1998, however, propelled by sharply rising land prices and because the decline in defense capital has ended. The government's asset holdings are vast. At the end of FY 2002, government assets are estimated to be worth about $2.8 trillion.

Liabilities

Table 3–1 includes all the liabilities that would appear on a business balance sheet, but only those liabilities. All the various forms of publicly held federal debt are counted, as are federal pension and health insurance obligations to civilian and military retirees. The estimated liability arising from federal insurance and loan guarantee programs is also shown. Other obligations, however, including the benefit payments under Social Security and other income transfer programs are not shown in this table because these are not liabilities in a legal sense. The budget projections and other data in Part II provide a sense of these broader obligations.

Financial Liabilities: Financial liabilities amounted to about $3.6 trillion at the end of 2002, down from a peak value of $4.3 trillion in 1996. The single largest component of these liabilities was federal debt held by the public, which amounted to around $3.5 trillion at the end of FY 2002. In addition to the debt held by the public, the government owes about $0.1 trillion in miscellaneous liabilities. The publicly held debt declined for several years because of the unified budget surplus at the end of the 1990s, but recently it has begun to increase again.

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 are often small initially, and 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. As is true elsewhere in this chapter, this estimate does not incorporate the market value of the risk associated with these contingent liabilities.

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 civilian retirees with subsidized health insurance through the Federal Employees Health Benefits program and military retirees receive similar benefits. The amount of these liabilities is large and growing. The discounted present value of the benefits is estimated to have been around $2.6 trillion at the end of FY 2002 up from $2.2 trillion in 2000.[1] 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 build-up in net liabilities since 1960 has not significantly damaged federal creditworthiness. Government interest rates in early 2003 were at their lowest levels in over a generation. There are limits, however, to how much debt the government can assume without putting its finances in jeopardy. Over some time horizon, the federal government must take in enough revenue to cover all of its spending including debt service.

PART II—THE LONG-RUN BUDGET OUTLOOK

A traditional balance sheet with its focus on past transactions can only show so much information. For the government, it is important to anticipate what future budgetary requirements might flow from future transactions. Even very long-run budget projections can be useful in sounding warnings about potential problems despite their uncertainty. 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 to grow.

Programs like Social Security and Medicare are intended to continue indefinitely, and so long-range projections for Social Security and Medicare have been prepared for decades. Budget projections for individual programs, even ones as important as Social Security and Medicare, do not provide a gauge of the overall budgetary position. Only by projecting the entire budget is it possible to anticipate whether sufficient resources will be available to meet all the anticipated requirements. It is also necessary to estimate how the budget's future growth compares with that of the economy to judge how well the economy might be able to support future budgetary needs.

To assess the overall financial condition of the government, it is necessary to examine the future prospects for all government programs including the revenue sources that support government spending. Such an assessment reveals that the key drivers of the long-range deficit are, not surprisingly, Social Security and Medicare. Other programs have significant implications for

[1] The pension liability is the actuarial present value of benefits accrued-to-date based on past and projected salaries. The 2002 liability is extrapolated from recent trends. The retiree health insurance liability is based on actuarial calculations of the present value 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.

the long-range outlook also. Medicaid, the Federal program that helps states provide health insurance for low-income people and nursing home care for the elderly, is projected to grow rapidly over the next several decades and to add substantially to the overall budget deficit. Nowhere in the budget is there a large enough offset to reduce the strains imposed by Social Security, Medicare, and Medicaid in the long run.

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. Uncertainty, however, enhances the importance of making long-term projections because people are generally averse to risk, and knowing what the risks are requires projections. A full treatment of these risks is beyond the scope of this chapter, although it does show below how the budget projections respond to some of the key economic and demographic parameters. Given the uncertainties, the best that can be done is to work out the implications of expected developments on a "what if" basis. Despite the uncertainties, long-run projections are needed to evaluate the government's true fiscal condition.

The Impending Demographic Transition

In 2008, the first members 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 elderly population will skyrocket, putting serious strains on the budget because of increased expenditures for Social Security and for the government's health programs serving this population.

The pressures are expected to persist even after the baby-boomers expire. The Social Security actuaries project that the ratio of workers to Social Security beneficiaries will fall from around 3-½ 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. With fewer workers to pay the taxes needed to support the retired population, the budgetary pressures will continue. The problem posed by the demographic transition is a permanent one.

Currently, the three major entitlement programs—Social Security, Medicare, and Medicaid—account for 45 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 three-quarters of non-interest spending. In other words, under an extension of current-law formulas and the policies in the budget, almost all of the budget would go to these three programs alone. That would severely reduce the flexibility of the budget, and the government's ability to respond to new challenges.

An Unsustainable Path

These long-run budget projections show clearly that the budget is on an unsustainable path, although the rise in the deficit unfolds gradually. As the baby-boomers reach retirement age in large numbers, the deficit is projected to rise steadily as a share of GDP. Under most scenarios, well before the end of the projection period for this chapter rising deficits would drive debt to levels several times the size of GDP.

The revenue projections in this section start with the budget's estimate of receipts under the Administration's proposals. They assume that individual income tax receipts will rise somewhat relative to GDP, and over the next several decades they eventually increase by approximately 1 percent of GDP. This increase reflects the higher marginal tax rates that people will face as their real incomes rise in the future (the tax code is indexed for inflation, but not for real economic growth). In terms of total receipts collected relative to GDP, however, those income tax increases are largely offset by declines in federal excise tax receipts, which are generally not indexed for inflation, and in other taxes. The overall share of federal receipts in GDP is projected to remain fairly steady around 19 percent, at the upper end of the historic average of 17 to 19 percent that prevailed from 1960 through the mid-1990s.

The long-run budget outlook remains uncertain (see the technical note at the end of this chapter for a discussion of the forecasting assumptions used to make these budget projections). With pessimistic assumptions, the fiscal picture deteriorates even sooner than in the base projection. More optimistic assumptions imply a longer period before the inexorable pressures of rising entitlement spending overwhelm the budget. But despite unavoidable uncertainty, these projections show that under a wide range of reasonable forecasting assumptions resources will be insufficient to cover the long-run shortfalls in Social Security and Medicare. Fundamental reforms are needed in these two programs to preserve their basic promises.

Alternative Economic and Technical Assumptions

The quantitative results discussed above are sensitive to changes in underlying economic and technical assumptions. Some of the most important of these alternative assumptions and their effects on the budget outlook are discussed below. Each highlights one of the key uncertainties in the outlook. All show that there are mounting deficits under most reasonable projections of the budget.

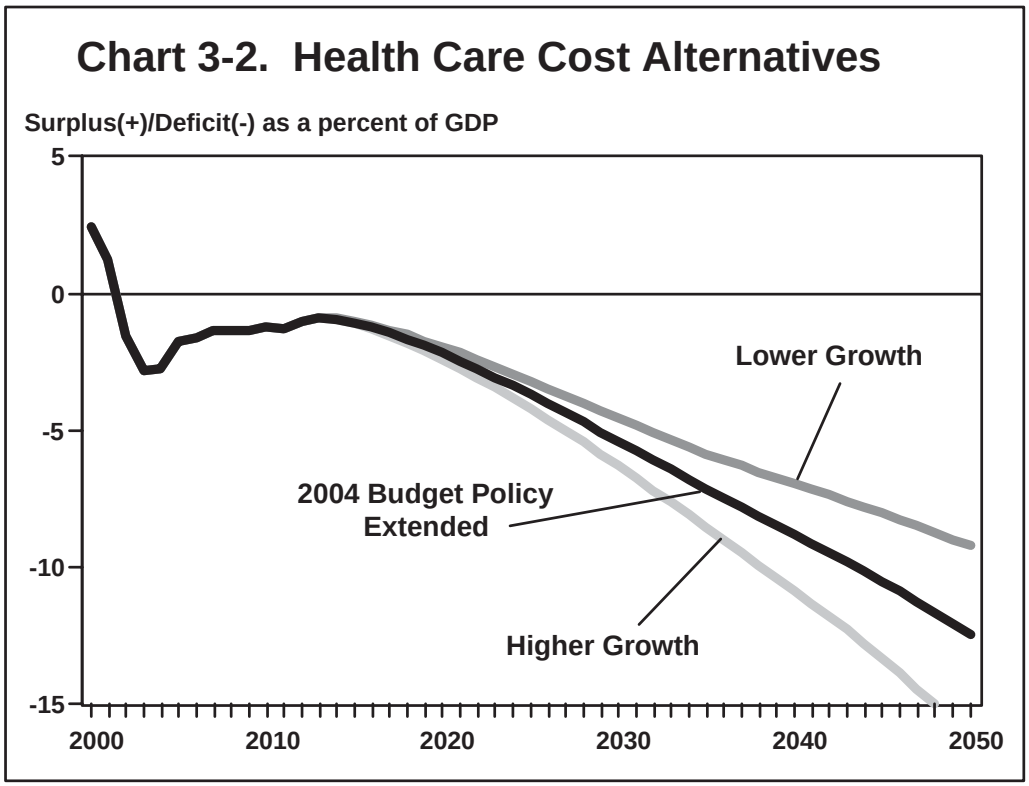
1. *Health Spending:* The projections for Medicare over the next 75 years are based on the actuarial projections in the 2002 Medicare trustees' report. Following the recommendations of its Technical Review Panel, the Medicare trustees have set the long-run projected growth rate assumed for real per capita 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."

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

(Percent of GDP)

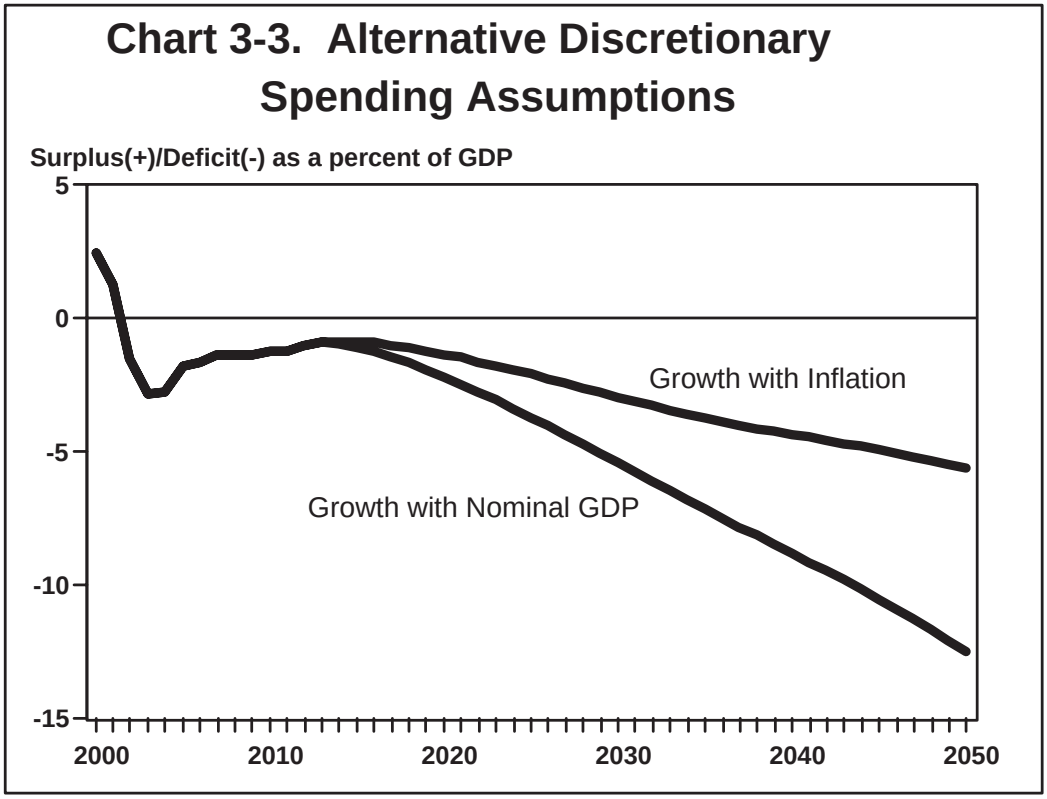
	2000	2010	2020	2030	2040	2060	20800
Discretionary Spending Grows with GDP							
Receipts	20.8	18.4	18.8	19.0	19.0	19.2	19.3
Outlays	18.4	19.6	21.0	24.4	27.8	36.7	52.7
Discretionary	6.3	6.5	6.0	6.0	6.0	6.0	6.0
Mandatory	9.8	11.3	13.2	15.5	16.8	19.0	22.8
Social Security	4.2	4.3	5.3	6.2	6.4	6.6	7.1
Medicare	2.0	2.6	3.4	4.6	5.5	7.0	9.3
Medicaid	1.2	1.9	2.4	2.7	3.2	4.0	5.0
Other	2.4	2.4	2.1	1.9	1.7	1.5	1.4
Net Interest	2.3	1.8	1.8	2.9	5.0	11.7	23.9
Surplus or Deficit (–)	2.4	–1.2	–2.2	–5.4	–8.8	–17.5	–33.5
Primary Surplus or Deficit (–)	4.7	0.6	–0.4	–2.5	–3.8	–5.8	–9.6
Federal Debt Held by the Public	35.1	35.7	35.1	56.7	98.4	229.4	466.1

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. Whether society will be willing to devote the large share of resources to health care implied by these projections, however, is an open question. The alternatives highlight the effect of raising the projected growth rate in per capita health care costs by ½ percentage point and the effect of lowering it by a similar amount.

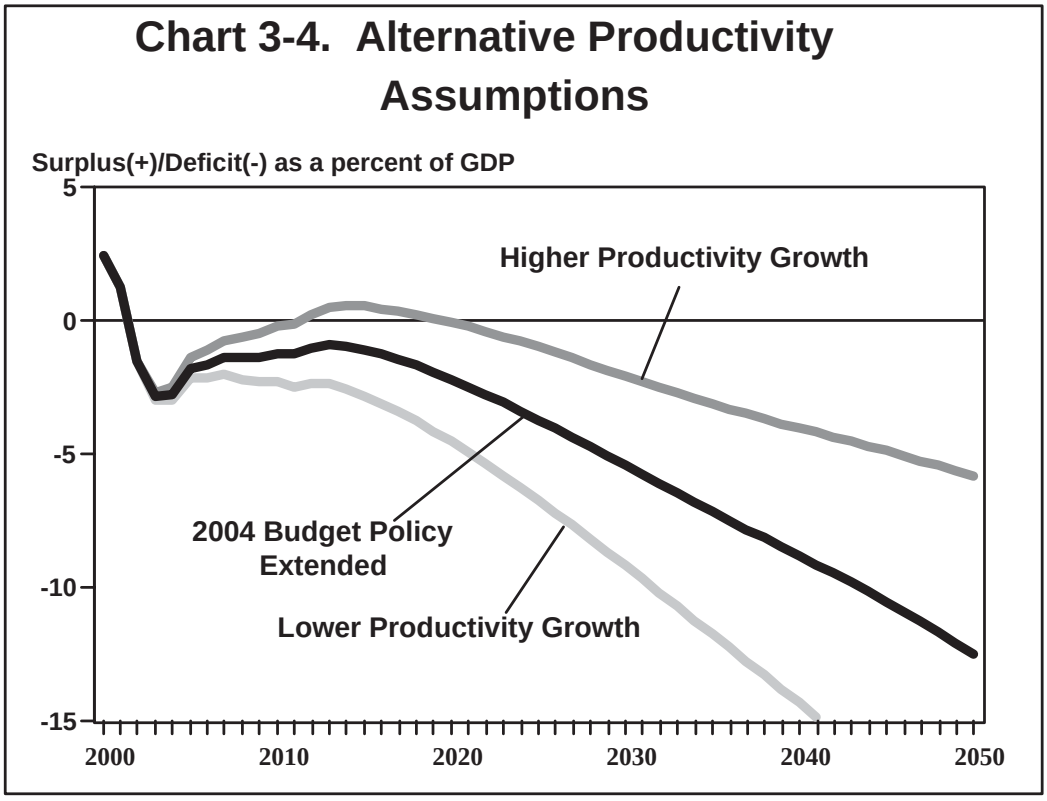


2. *Discretionary Spending:* The assumption used to project discretionary spending is essentially arbitrary, because discretionary spending is determined annually through the legislative process, and no formula can dictate future spending in the absence of legislation. Alternative assumptions have been made for discretionary

spending in past budgets. Holding discretionary spending unchanged in real terms is the "current services" assumption used for baseline budget projections. Extending this assumption over many decades, however, may not be realistic. When the population and economy are both expected to grow, as assumed in these projections, the demand for public services is likely to expand, although not necessarily as fast as GDP. The current base projection assumes that discretionary spending keeps pace with the growth in GDP in the long run, so that spending increases in real terms whenever there is real economic growth. An alternative assumption would be that discretionary spending increases only for inflation. In other words, the real inflation-adjusted level of discretionary spending holds constant. This alternative moderates the long-run rise in the deficit somewhat because the shrinkage in discretionary spending as a share of GDP offsets the rise in entitlement outlays to some extent.



3. *Productivity:* The rate of future productivity growth has an important effect on the long-run budget outlook. It is also highly uncertain. Over the next few decades an increase in productivity growth would reduce the projected budget deficits appreciably. Higher productivity growth adds directly to the growth of the major tax bases while for many outlays it has only a delayed effect even assuming that in the long-run discretionary outlays rise with GDP. In the latter half of the 1990s, after two decades of much slower growth, productivity growth increased unexpectedly to around 2.7 percent per year. The return of higher productivity growth is one of the most welcome developments of the last several years. Although the long-run growth rate of productivity is inherently uncertain, it has averaged 2.2 percent since 1947. The long-run budget projections assume that real GDP per hour will grow at a 2.2 percent annual rate over most of this century. The alternatives highlight the effect of raising the projected productivity growth rate by ½ percentage point and the effect of lowering it by a similar amount.



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 much slower rate than has prevailed historically in the United States.
- Mortality is projected to decline. The average female lifespan is projected to rise from 79.4 years in 2001 to 85.6 years by 2080, and the average male lifespan is projected to increase from 73.8 years in 2001 to 81.4 years by 2080. A technical panel to the Social Security trustees recently reported that the improvement in longevity might even be greater.

Chart 3-5. Alternative Fertility Assumptions

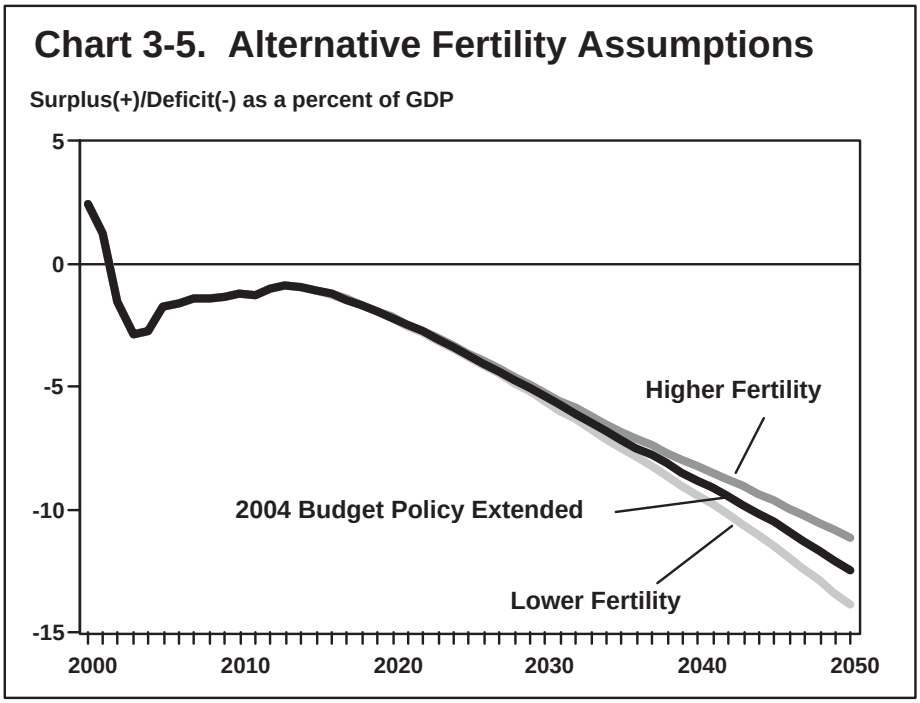
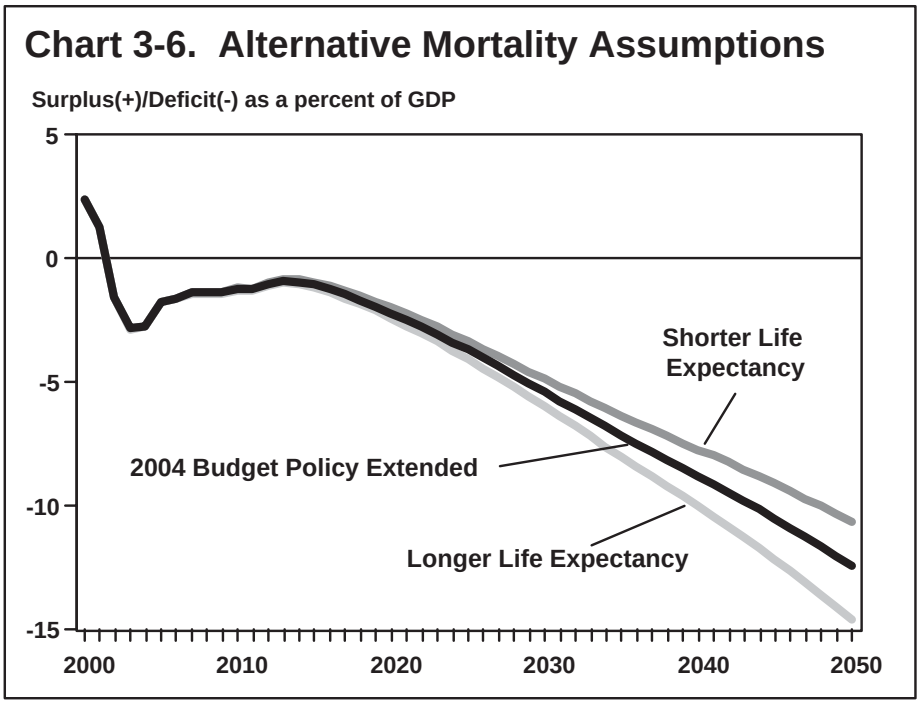
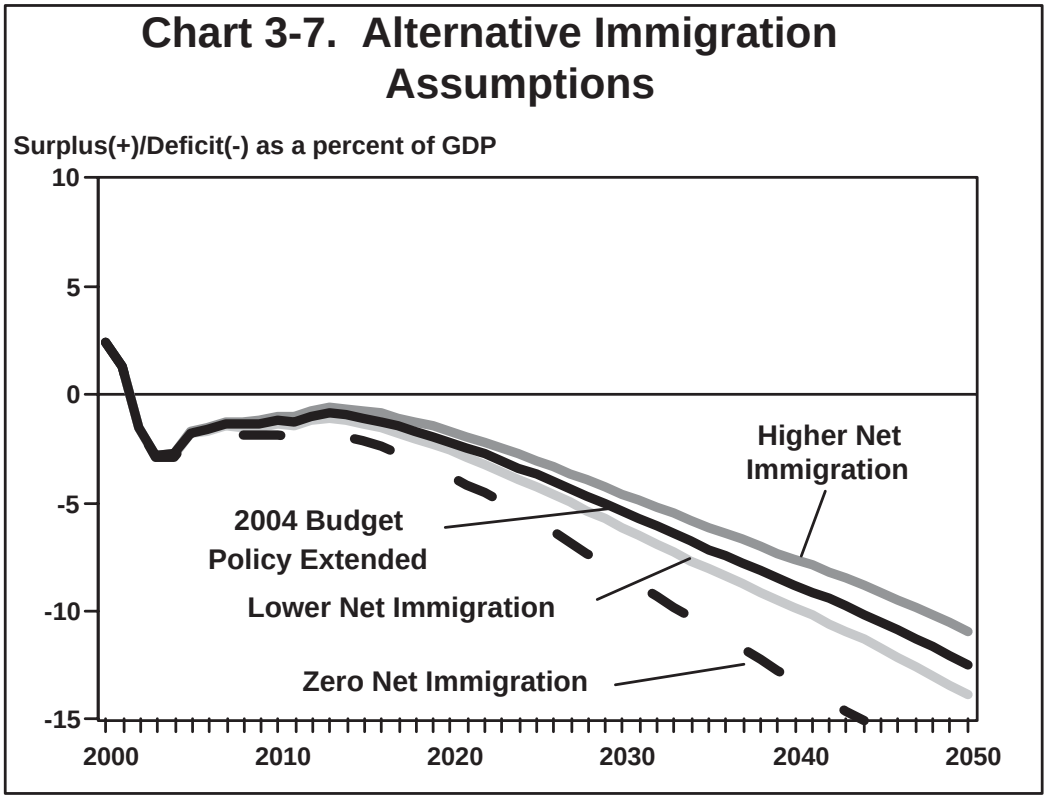


Chart 3-6. Alternative Mortality Assumptions





Actuarial Projections for Social Security and Medicare

Social Security and Medicare are the government's two largest entitlement programs. Both rely on payroll tax receipts from current workers and employers for at least part of their financing, while the programs' benefits largely go to those who are retired. The importance of these programs for the retirement security of current and future generations makes it essential to understand their long-range financial prospects. Although Social Security and Medicare's HI program are currently in surplus, actuaries for both programs have calculated that they face long-run deficits. How best to measure the long-run imbalances in Social Security and in the consolidated Medicare program, including SMI as well as HI, is a challenging analytical question, but reasonable calculations suggest that each program embodies such a huge financial deficiency that it will be very difficult for the government as a whole to return to surplus without addressing each program's financial problems.

Social Security: The Long-Range Challenge

Social Security provides retirement security and disability insurance for tens of millions of Americans through a system that is intended to be self-financing. The principle of self-financing is important because it compels corrections in the event that projected benefits consistently exceed dedicated receipts.

While Social Security is running surpluses today, it will begin running cash deficits within 20 years. Social Security's spending path is unsustainable under current law because of the retirement of the baby-boomers and demographic trends toward lower fertility rates and longer life spans. These trends imply that the number of workers available to support each retiree will decline from over 3 today to just around 2 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, but a gap between Social Security receipts and outlays emerges under a wide range of reasonable forecasting assumptions. 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.

The current structure of Social Security leads to substantial generational differences in the average rate of return people can expect from the program. While previous generations have fared extremely well, the average individual born today can expect to receive less than a two percent annual real rate of return on their payroll taxes. Moreover, such estimates overstate the expected rate of return for future retirees, because they assume no changes in current-law taxes or benefits even though such changes are inevitable to meet Social Security's financing shortfall. As an example, a 1995 analysis found that for an average worker born in 2000 a 1.7 percent rate of return would turn into 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 their payroll taxes in personal retirement accounts. The President's Commission to Strengthen Social Security presented various options that would include personal accounts within the Social Security framework.

The 75-Year Horizon: In their annual reports and related documents, the Social Security and Medicare trustees typically present calculations of the 75-year actuarial imbalance or deficiency for Social Security and Medicare. The calculations covers current workers and retirees, as well as those projected to join the program within the next 75 years (this is the so-called "open-group" calculation; the "closed-group" covers only current workers and retirees). These estimates measure the present discounted value of each program's future benefits net of future income. They are complementary to the flow projections described in the preceding section.

The present discounted value of the Social Security deficiency net of the trust fund balance was estimated to be about $3 trillion at the beginning of 2002, and the comparable estimate for Medicare's HI trust fund was $5 trillion. But, as discussed above, this number does not account for the fact that 75 percent of SMI expenses are not covered by any specific financing source. From this perspective, the Medicare unfunded promise is around $13 trillion. Even if the general fund contribution to SMI were to continue into the future and grow at the rate of inflation, the unfunded promise would be $11 trillion. These estimates have been increasing in recent years as seen in Table 3–3. (The estimates in Table 3–3 are based on the intermediate economic and demographic assumptions used for the 2002 trustees' reports. These differ in some respects from the assumptions used for the long-run budget projections described in the preceding section, but the basic message of Table 3–3 would not change if OMB assumptions had been used for the calculations.)

Medicare: The Long-Range Challenge

Medicare provides health insurance for tens of millions of Americans, including most of the nation's seniors. It is composed of two programs: Hospital Insurance (HI), which covers medical expenses relating to hospitalization, and Supplemental Medical Insurance (SMI), which pays for physicians' services and other related expenditures. HI is self-financing through payroll taxes, while SMI is financed partly through participants' premium payments, and partly through general revenue.

According to the Medicare Trustees' most recent report, projected spending for HI under current law will exceed taxes going into the HI trust fund beginning in 2016, and the fund is projected to be depleted by 2030. Looking at the long-run, the Medicare actuaries project a 75-year unfunded promise to Medicare's hospital insurance (HI), or Part A, trust fund of $5 trillion. However, this measure tells only half the story because it does not consider Medicare's other trust fund—the Supplementary Medical Insurance Trust Fund (SMI), or Part B. This trust fund covers physician and outpatient services, which are projected to grow even faster than hospital services. Medicare beneficiary premiums only cover 25 percent of SMI costs. The other 75 percent of SMI expenses are not covered by any specific financing source. From this perspective, Medicare's total unfunded promise is about $13 trillion. Even if the general fund contribution to SMI were to continue into the future and grow at the rate of inflation, the unfunded promise would be $11 trillion.

The main reason for the projected future shortfall in Medicare is the substantial growth projected for total Medicare spending. 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, per capita spending is also expected to continue rising rapidly. The growth in per beneficiary expenditures for SMI, like HI, is projected to exceed the growth rate of per capita GDP by a full percentage point. Together these factors push up total spending very sharply. As a percentage of GDP, Medicare outlays are projected by OMB to quadruple increasing from around 2 percent in 2002 to 9 percent by 2080, which is faster than the growth of either Social Security or Medicaid, the other large rapidly growing Federal entitlements.

The Administration is committed to working with the Congress to reform Medicare in a manner that does not make this unfunded promise any larger.

Limiting the calculations to 75 years understates the deficiencies, because the actuarial calculations omit the large deficits that continue to accrue beyond the 75th year. The understatement is significant, even though values beyond the 75th year are discounted by a large amount. The current deficiency in Social Security is essentially due to the excess benefits paid to past and current participants compared with their taxes. For current program participants, the present value of expected future benefits exceeds the present value of expected future taxes by about $11 trillion. By contrast, future participants—those who are now under age 15 or not yet born—are projected to pay in present value about $7 trillion more over the next 75 years than they will collect in benefits over that period. In fixing the horizon at 75 years, most of the taxes of these future participants are counted without a full accounting for their expected benefits, much of which will be received beyond the 75th year. For Social Security, the present value of benefits less taxes in the 76th year alone is nearly $0.1 trillion, so the omission of these distant benefits amounts to several trillion dollars of present value.

Medicare: A significant portion of Medicare's deficiency is caused by the rapid expected increase in future benefits due to rising health care costs. Some, perhaps most, of the projected increase in relative health care costs reflects improvements in the quality of care, although there is also evidence that medical errors and waste add unnecessarily to health care costs. The rapid growth in the number of medical malpractive cases and in the magnitude of the resulting awards and settlements has also contributed to rising health care costs. Even though the projected increases in Medicare spending are likely to contribute to longer lifespans and safer treatments, the financial implications remain the same. As long as medical costs continue to outpace the growth of other expenditures, as assumed in these projections, the financial pressure on the budget will mount, and that is reflected in the estimates shown in Tables 3–2 and 3–3.

For current participants, the difference between the discounted value of benefits and taxes plus premiums is nearly $13 trillion, significantly larger than the similar gap for Social Security. For future participants over the next 75 years, however, Medicare benefits are projected to be roughly equal in magnitude to future taxes and premiums. Unlike Social Security, future taxes do not exceed benefits during this period, and the future generations' projected taxes do not reduce the overall

Table 3–3. ACTUARIAL PRESENT VALUES OVER A 75-YEAR PROJECTION PERIOD

(Benefit Payments in Excess of Earmarked Taxes and Premiums, in trillions of dollars)

	2000	2001	2002
Social Security			
Future benefits less future taxes for those age 15 and over	9.6	10.5	11.2
Future benefits less taxes for those age 14 and under and those not yet born	-5.8	-6.3	-6.7
Trust Fund Balance [1]	-0.9	-1.0	-1.2
Net present value for past, present and future participants	**2.9**	**3.2**	**3.4**
Medicare			
Future benefits less future taxes and premiums for those age 15 and over	9.9	12.5	12.9
Future benefits less taxes and premiums for those age 14 and under and those not yet born	-0.7	0.3	0.4
Trust Fund Balance [1]	-0.2	-0.2	-0.3
Net present value for past, present and future participants	**9.0**	**12.6**	**13.0**
Social Security and Medicare			
Future benefits less future taxes and premiums for those age 15 and over	19.5	23.0	24.1
Future benefits less taxes and premiums for those age 14 and under and those not yet born	-6.5	-6.0	-6.3
Trust Fund Balance [1]	-1.1	-1.3	-1.5
Net present value for past, present and future participants	**12.0**	**15.8**	**16.4**
Addendum:			
Actuarial deficiency as a percent of the discounted payroll tax base:			
Social Security	.....	.....	1.87
Medicare (including both HI and SMI)	.....	.....	5.23

[1] Reflects prior accumulated net cash flows including payments and taxes for those no longer alive.

deficiency, even though benefits beyond the 75th year are not counted. Extending the calculation beyond the 75th year would add many trillions of dollars in present value to Medicare's actuarial deficiency, just as it would for Social Security.

General fund revenues have historically covered about 75 percent of SMI program costs, with the rest being covered by premiums paid by the beneficiaries. In Table 3–3, only the receipts explicitly earmarked for financing these programs have been included. The intragovernmental transfer is not a dedicated source of funding, and the share of general revenues that would have to be devoted to SMI to close the gap increases substantially under current projections. Other government programs also have a claim on these funds, and SMI has no priority in the competition for future funding.

The Trust Funds and the Actuarial Deficiency: The current amounts in the Social Security and Medicare trust funds are offset in Table 3–3 against future benefits to measure the net actuarial short-falls in the two programs. This is an appropriate adjustment because the trust fund balances represent the past excess of taxes over benefits for these programs, but the government did not save those excess taxes in any economically significant sense, and the trust funds will not help the government as a whole meet its obligations to pay for future social security benefits.

These are subtle points, but important ones. First, the simple fact that a trust fund exists does not mean that the government necessarily saved the money recorded there. Although the government could have saved the Social Security and HI trust fund surpluses as they accumulated (in the sense of adding to national saving) this would have required it to use the trust fund surpluses to reduce the unified budget deficit (or add to the unified surplus). In all likelihood, the government did not save these surpluses in this way. Indeed, the large unified budget deficits that prevailed during most of the time when the trust funds were increasing suggests strongly that it did not, although to know this for sure it would be necessary to know what the unified deficit would have been in the absence of those trust fund surpluses, and that is not really knowable.

Second, the assets in the trust funds are special purpose financial instruments issued by the Treasury Department. At the time Social Security redeems these instruments to pay future benefits, the Treasury will have to turn to the public capital markets to raise the funds to redeem the bonds and finance the benefits, just as if the trust funds had never existed. From the standpoint of overall government finances, the trust funds do not reduce the future burden of financing Social Security or Medicare benefits.

In any case, the trust funds remain small in size in comparison with the programs' future obligations and well short of what would be needed to pre-fund future benefits as indicated by the programs' actuarial deficiencies. Historically, Social Security and Medicare's HI program have been financed mostly on a pay-as-you-go basis, whereby workers' payroll taxes were immediately used to pay retiree benefits. For the most part, workers' taxes have not been used to pre-fund their own future benefits, and until relatively recently, taxes were not set at a level sufficient to pre-fund future benefits even had they been saved.

The Importance of Long-Run Measures in Evaluating Policy Changes: Consider a proposed policy change in which payroll taxes paid by younger workers were reduced by $100 this year while the expected present value of these workers' future retirement benefits were also reduced by $100. The actuarial deficiencies shown

in Table 3–3 would not be affected by such a plan: the present value of future benefit payments would decrease by the same amount as the reduction in revenue. On a cash flow basis, however, the lost revenue occurs now, while the decrease in future outlays is in the distant future beyond the budget window, and the federal government must increase its borrowing to make up for the lost revenue in the meantime. If policymakers only focus on the government's near-term borrowing needs, a reform such as this would appear to worsen the government's finances, whereas the policy actually has a neutral impact.

Now suppose that future outlays were instead reduced by a little more than $100 in present value. In this case, the actuarial deficiency would actually decline, even though the government's borrowing needs would again increase. Focusing on the government's near-term borrowing alone, therefore, can lead to a bias against policies that could improve the federal government's overall fiscal condition. Taking a longer view of policy changes and considering other measures of the government's fiscal condition can correct for such mistakes.

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. However, if the investments are not owned by the federal government, the fraction of their 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 including education and research and development. This may seem like a small fraction, but it represents a large volume of capital—$6.7 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.

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 $43 trillion in 2002, consisting of $36 trillion in private physical capital and $7 trillion in public physical capital; by comparison, GDP was about $10 trillion in 2002. 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 goal 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 $42 trillion in 2002, 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

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	2000	2001	2002
ASSETS											
Publicly Owned Physical Assets:											
Structures and Equipment	2.0	2.3	2.9	3.5	3.7	3.9	4.3	4.7	5.4	5.5	5.5
Federally Owned or Financed	1.2	1.2	1.4	1.5	1.5	1.8	1.9	2.0	2.0	2.0	2.1
Federally Owned	1.0	1.0	1.1	1.0	1.0	1.1	1.1	1.1	1.0	1.0	1.0
Grants to State and Local Governments	0.1	0.2	0.3	0.5	0.5	0.7	0.8	0.8	1.0	1.0	1.1
Funded by State and Local Governments	0.9	1.1	1.5	2.0	2.2	2.2	2.4	2.7	3.4	3.5	3.4
Other Federal Assets	0.7	0.7	0.7	0.8	1.3	1.4	1.1	0.8	1.2	1.2	1.2
Subtotal	2.7	3.0	3.5	4.3	5.0	5.3	5.4	5.6	6.5	6.7	6.7
Privately Owned Physical Assets:											
Reproducible Assets	7.1	8.1	10.0	12.8	16.5	17.4	19.7	21.5	25.9	26.4	27.4
Residential Structures	2.7	3.2	3.8	4.9	6.6	6.8	7.7	8.7	10.7	11.0	11.6
Nonresidential Plant and Equipment	2.9	3.2	4.1	5.4	6.8	7.5	8.3	9.0	10.9	11.1	11.4
Inventories	0.6	0.7	0.8	1.1	1.3	1.3	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	2.8	2.8	3.0
Land	2.1	2.5	2.8	3.7	5.6	6.4	6.6	5.1	7.6	8.0	8.9
Subtotal	9.1	10.6	12.8	16.4	22.2	23.8	26.3	26.6	33.5	34.4	36.3
Education Capital:											
Federally Financed	0.1	0.1	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.2
Financed from Other Sources	6.2	7.9	10.7	13.2	17.2	20.6	26.6	29.6	37.9	38.9	40.4
Subtotal	6.2	8.0	10.9	13.5	17.7	21.2	27.3	30.5	39.1	40.1	41.6
Research and Development Capital:											
Federally Financed R&D	0.2	0.3	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.0	1.1
R&D Financed from Other Sources	0.1	0.2	0.3	0.4	0.5	0.7	0.9	1.1	1.5	1.6	1.7
Subtotal	0.3	0.5	0.8	0.9	1.1	1.3	1.7	2.0	2.5	2.6	2.7
Total Assets	**18.4**	**22.1**	**28.0**	**35.2**	**45.9**	**51.7**	**60.7**	**64.6**	**81.6**	**83.8**	**87.4**
Net Claims of Foreigners on U.S. (+)	–0.1	–0.2	–0.2	–0.1	–0.4	0.0	0.8	1.5	2.9	2.8	3.2
Net Wealth	**18.5**	**22.3**	**28.1**	**35.3**	**46.3**	**51.7**	**59.9**	**63.1**	**78.7**	**81.0**	**84.2**
ADDENDA:											
Per Capita Wealth (thousands of 2002 $)	102.8	115.0	137.5	163.7	202.9	216.4	239.2	236.7	278.6	284.0	292.5
Ratio of Wealth to GDP (in percent)	703.3	715.3	695.0	695.6	678.8	673.6	662.6	682.8	689.1	711.2	713.9
Total Federally Funded Capital (trils 2002 $)	2.1	2.4	2.8	3.2	3.8	4.4	4.6	4.6	5.3	5.4	5.5
Percent of National Wealth	11.4	10.7	9.8	9.1	8.3	8.6	7.7	7.3	6.7	6.7	6.6

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 income 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.[2] That stock is estimated to have been $2.7 trillion in 2002. 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 these 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. Americans' willingness and ability to borrow safely helped fuel the expansion of the 1990s, and continue to support consumption in the current recovery. In contrast, bad debts, which are not collectible, can cause serious problems for the banking system.

The only debts that appear in Table 3–4 are the debts Americans owe to foreigners. 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 com-

[2] 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.

Table 3–5. ECONOMIC AND SOCIAL INDICATORS

General categories	Specific measures	1960	1965	1970	1975	1980	1985	1990	1995	1999	2000	2001	2002
Economic:													
Living Standards	Real GDP per person (1996 dollars)	$13,145	$15,587	$17,445	$18,909	$21,523	$23,971	$26,832	$28,328	$31,741	$32,582	$32,354	$32,837
	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	2.8	2.2	1.9
	Median Income (2000 dollars):												
	All Households	N/A	N/A	$34,481	$34,219	$36,035	$37,059	$39,324	$39,306	$43,355	$43,162	$42,228	N/A
	Married Couple Families	$29,746	$34,620	$41,516	$43,113	$47,086	$48,798	$52,394	$54,284	$60,202	$60,748	$60,335	N/A
	Female Householder, Husband Absent	$15,032	$16,831	$20,107	$19,847	$21,177	$21,434	$22,237	$22,713	$25,209	$26,434	$25,745	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	29.3	N/A
	Poverty Rate (%) [1]	22.2	17.3	12.6	12.3	13.0	14.0	13.5	13.8	11.8	11.3	11.7	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	5.8
	CPI-U (% Change)	1.7	1.6	5.8	9.1	13.5	3.5	5.4	2.8	2.2	3.4	2.8	1.6
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	1.9	–1.4	0.2
	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	31.3
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	5.9	3.3	2.0
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	105.5	N/A
	Multifactor Productivity (average annual percent change)	0.9	2.9	0.8	1.1	0.8	0.5	0.5	0.6	0.9	1.2	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	25,439	24,899	N/A	N/A
	Sulfur Dioxide Emissions (thousand short tons)	22,227	26,750	31,161	28,011	25,905	23,658	23,678	19,189	19,349	18,201	N/A	N/A
	Lead Emissions (thousand short tons)	N/A	N/A	221	160	74	23	5	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	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	22.3	22.7	N/A
Safe Communities	Violent Crime Rate (per 100,000 population) [2]	160	199	364	482	597	557	732	685	523	507	504	491
	Murder Rate (per 100,000 population) [2]	5	5	8	10	10	8	9	8	6	6	6	6
	Murders (per 100,000 Persons Age 14 to 17)	N/A	N/A	N/A	5	6	5	10	11	6	5	N/A	N/A
Health	Infant Mortality (per 1000 Live Births) [3]	26.0	24.7	20.0	16.1	12.6	10.6	9.2	7.6	7.1	6.7	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	7.7	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	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	23.3	22.8	21.5
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	84.1	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	25.6	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	N/A
	Science High School Seniors	N/A	N/A	305	293	286	288	290	295	295	N/A	N/A	N/A
Participation	Individual Charitable Giving per Capita (2000 dollars)	235	282	338	359	391	402	446	423	561	563	573	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	.....

[1] The poverty rate does not reflect noncash government transfers such as Medicaid or food stamps.

[2] Not all crimes are reported, and the fraction that go unreported may have varied over time, 1999 data are preliminary.

[3] Some data from the national educational assessments have been interpolated.

pared with the total stock of U.S. assets. It amounted to 3.7 percent of total assets in 2002.

Federal debt does not appear explicitly in Table 3–4 because most of it consists of claims held by Americans; only that portion of the Federal debt which is held by foreigners is included along with the other debts 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 4.4 percent of net U.S. wealth as shown in Table 3–4. However, prospective liabilities are much larger share of national wealth.

Trends in National Wealth

The net stock of wealth in the United States at the end of FY 2002 was about $84 trillion, eight times the level of GDP. Since 1981, it has increased in real terms at an average annual rate of 2.8 percent per year. The net stock of private nonresidential plant and equipment grew 2.3 percent per year from 1981 to 2002. However, private nonresidential fixed capital has increased much more rapidly since 1995—4.8 percent per year—reflecting the investment boom in the latter half of the 1990s.

The accumulation of education capital, as measured here, grew at an average rate of 5.3 percent per year in the 1960s and 1970s, about 0.8 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 4.0 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 grown about 4.3 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 Fed-

eral 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 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 2000–2002 than at any time since the 1960s. The 2001 recession has had an effect on some of these indicators. Unemployment has risen and real GDP growth has declined. But as the economy recovers much of the improvement shown in Table 3–5 is likely to be preserved.

PART IV—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 that goes beyond the standard measures of outlays, receipts and the surplus/deficit. It includes information that might appear on a federal balance sheet, but goes beyond that to include long-run projections of the budget that can be used to show where future fiscal strains are most likely to appear. It also includes measures that indicate some of what society has gained economically and socially from Federal programs funded through the budget.

Relationship with FASAB Objectives

The framework presented here meets the stewardship objective [3] 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.

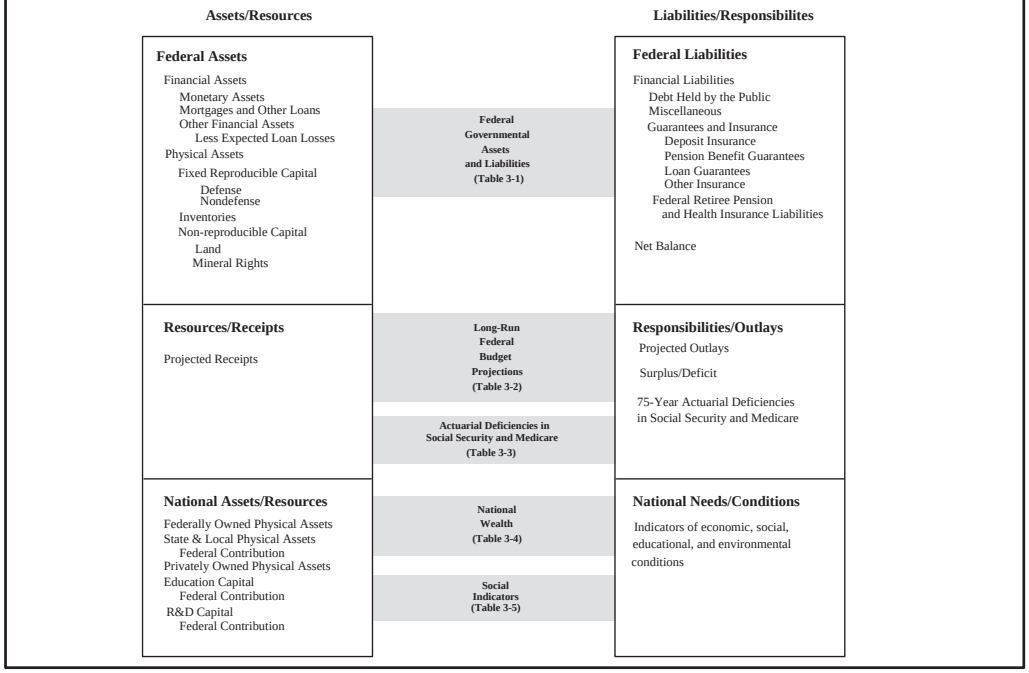
Connecting the Dots: The presentation above consists of a series of tables and charts. Taken together, they serve some of the same functions as a business balance sheet. The schematic diagram, Chart 3–8, shows how the different pieces fit together. The tables and charts should be viewed as an ensemble, the main elements of which are grouped in two broad categories—assets/resources and liabilities/responsibilities.

- Reading down the left-hand side of Chart 3–8 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.

[3] 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.

- 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.

Chart 3-8. A Balance Sheet Presentation for the Federal Government



TECHNICAL NOTE: SOURCES OF DATA AND METHODS OF ESTIMATING

Long-Range Budget Projections

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

Demographic and Economic Assumptions: For the years 2003–2013, the assumptions are identical to those used in the budget. These budget assumptions reflect the President's policy proposals. The economic assumptions are extended beyond 2013 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 2002 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. Productivity growth is held constant at the average rate of growth implied by the budget's economic assumptions.

- CPI inflation holds stable at 2.3 percent per year; the unemployment rate is constant at 5.1 percent; and the yield on 10-year Treasury notes is steady at 5.6 percent, which are the final values at the end of the budget forecast for each of these variables.
- Real GDP per hour grows at the same constant rate as in the Administration's medium-term projections—2.2 percent per year—through 2080.
- U.S. population growth slows from around 1 percent per year to about half that rate by 2030, and even less after that point. Real GDP growth slows with the expected slowdown in population growth. These implications follow from the Trustees' intermediate demographic projections.

The economic and demographic 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.

Budget Projections: For the period through 2013, the projections follow the budget. 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. Discretionary outlays grow at the rate of growth in nominal GDP. Social Security is projected by the Social Security actuaries using these long-range assumptions. Medicare benefits are projected based on the estimates in the 2002 Medicare trustees' report, adjusted for differences in the growth rate in GDP per capita. Federal pensions are derived from the most recent actuarial forecasts available at the time the budget is prepared, repriced using Administration inflation and wage assumptions. Medicaid outlays are based on the economic and demographic projections in the model. 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.

Federally Owned Assets and Liabilities

Financial Assets: The source of data is the Federal Reserve Board's Flow-of-Funds Accounts. The gold stock was revalued using the market value for gold.

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 chain-weighted price indices for federal investment from the National Income and Product Accounts (see chapter 7).

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.

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 1979–2001, 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 2002 is a projection. The health insurance liability was estimated by the program actuaries for 1997–2001, and extrapolated back for earlier years.

National Balance Sheet

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 2002.

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 2002 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 chain-weighted GDP price index 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.

Sources of Data and Assumptions for Estimating 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.