CHAPTER 1

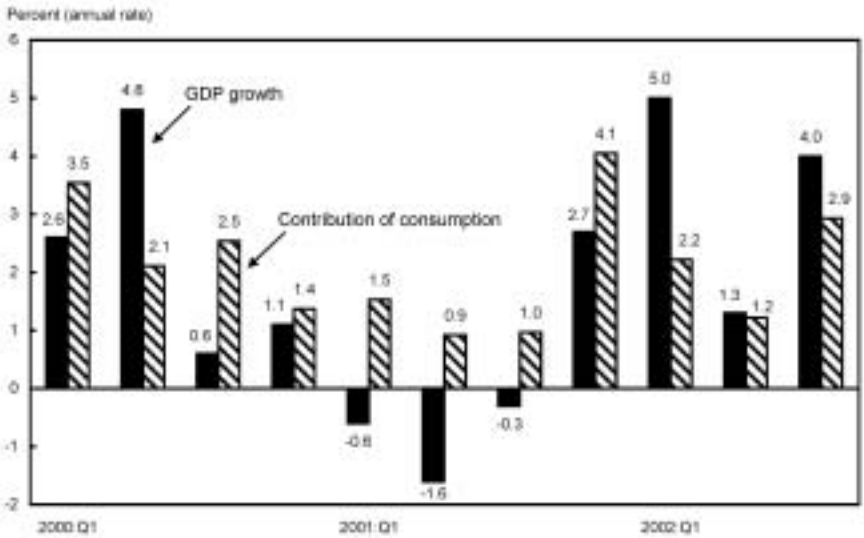
Macroeconomic Performance in 2002

The U.S. economy solidified its forward progress in 2002, with the third quarter of the year marking the fourth consecutive quarter of economic growth. This progress followed a contraction in 2001 that was deeper and longer than initial data suggested, but still mild by historical standards. Real gross domestic product (GDP) declined by 0.6 percent during the first three quarters of 2001, about one-fourth the average percentage decline over the previous seven recessions. Growth resumed in the fourth quarter of 2001—despite the terrorist attacks in September—and real GDP rose at an annual rate of 3.4 percent in the first three quarters of 2002 (Chart 1-1). Although economic activity probably weakened in the fourth quarter, the ongoing improvement in productivity growth, together with lean inventories, foreshadowed a return to more normal levels of production and job growth in the quarters ahead.

The economic recovery of 2002 resulted from a constellation of factors, including the resiliency of the economy after the terrorist attacks and the

Chart 1-1 **GDP Growth and the Contribution of Consumption**

GDP expanded in 2002, in large part because of healthy gains in consumption expenditures.



Note: Contribution is in percentage points.

Source: Department of Commerce (Bureau of Economic Analysis)

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lagged effects of stimulative monetary and fiscal policy in 2001. Although the Federal Reserve lowered the Federal funds rate only once in 2002—by half a percentage point on November 6—the 475-basis-point reduction over the course of 2001 continued to stimulate the economy throughout the year. (A basis point is 0.01 percentage point.) Monetary stimulus was complemented by fiscal stimulus, in the form of the tax rate reductions included in the Economic Growth and Taxpayer Relief Reconciliation Act of 2001 (EGTRRA) and the investment incentives in the Job Creation and Worker Assistance Act (JCWAA) of 2002. In the long run, EGTRRA's reductions in marginal tax rates will raise potential output by increasing labor supply and encouraging the entrepreneurial activities that are the building blocks of economic growth. In the short run, however, the tax cuts buoyed disposable income and helped keep consumption high. Robust consumption, in turn, was a crucial locus of strength in the overall economy, contributing an average of 2.1 percentage points to real GDP growth during the first three quarters of the year. Additionally, the tax incentives in JCWAA, which the President signed in March, provided needed support to investment at a time when stability in this component of final demand was especially important.

In 2002 discussions of both economic activity and economic policy paid particular attention to the valuation of the economy's stock of productive assets. One of the more favorable developments for many Americans in 2002 was the continued appreciation of their most important investment: their home. Housing prices rose 6.2 percent from the third quarter of 2001 to the third quarter of 2002, following an 8.7 percent increase in the same period a year earlier. As discussed below, housing values were buoyed not only by low mortgage interest rates, which reached levels not seen in more than a generation, but also by rising demand, continuing strength in purchases of second homes, and ongoing improvements in mortgage finance. Strength in housing values contributed to robust increases in residential investment, providing another important impetus to final demand in 2002.

In the aggregate, however, the appreciation in housing wealth was overshadowed by continued losses in the stock market. Like those for all of the world's major equity exchanges, U.S. stock indexes lost ground in 2002, continuing a general slide that began in the spring of 2000. From the market's high point in the first quarter of 2000 to the fourth quarter of 2002, stockholders lost nearly $7 trillion in equity wealth. These losses continued to weigh heavily on economic growth and job creation in 2002, by reducing the wealth of consumers and raising the cost of equity capital for investing firms. The precise reasons for the bear market of 2000-02 are subject to debate, but the market's 3-year slide was probably influenced by two general factors: a decline in expected profit growth and an increase in the premium that investors required to hold risky assets. These factors continued to play important roles

in the first three quarters of 2002 as the stock market continued its decline. Specifically, corporate accounting scandals called into question the reported profits of some firms, while risk premiums (as measured by the difference, or spread, between the yields of corporate bonds and those of U.S. Treasuries) rose to near-record levels. Although some observers attributed most of the market's decline to the corporate scandals, it is worth noting that equity prices fell around the world, even in countries with different accounting systems and governance institutions.

The stock market's decline has caused some to question the productivity improvements of the late 1990s. Yet even though investors may have overestimated the value of particular technology-intensive investments, it would be a mistake to infer that technological improvements hold little promise for future economic growth. Detailed analyses of the sources of productivity growth indicate that the post-1995 productivity improvement owes much to the U.S. economy's ability to profit from technological innovation. If technology continues to progress at its recent pace, rising productivity will continue to bring about improvements in living standards that compare quite favorably with the more modest gains of only one or two decades ago.

In the short run, however, economic growth is determined by demand factors as well as by the economy's technology and potential to supply goods and services. The next section discusses the individual components of GDP from the demand side. There and elsewhere in the chapter, the discussion pays particular attention to the links between asset markets (which set the prices for stocks, bonds, and houses) and the components of real aggregate demand (consumption, investment, government purchases, and net exports).

GDP and Its Components in 2002

Consumption

Consumption continued to be the prime locomotive for the recovery in 2002, rising at an annual rate of 3.0 percent over the first three quarters of the year. (GDP data for the fourth quarter were not yet available as this *Report* went to press.) Expenditure on consumer durables was especially strong, in large part because of strong motor vehicle sales. Zero-percent financing offers and other aggressive sales promotions sent automobile sales soaring to more than 18 million units at an annual rate in July and August. (Automobile sales were also especially strong in December.) Largely as a result, expenditure on consumer durables accounted for more than 1.7 percentage points of GDP growth in the third quarter. Consumption of nondurable goods was especially

strong in the first quarter, rising 7.9 percent at an annual rate, but tailed off afterward. Finally, consumption of services remained robust, accounting for about 1 percentage point of GDP growth in each of the first three quarters of the year.

Disposable Income and Consumption

In 2002 strength in consumption resulted in large part from strength in purchasing power, as low inflation, tax relief, and steady nominal income growth kept real disposable incomes high. On the price side, financing incentives reduced the effective cost of new cars, allowing motor vehicle sales to be a main driver of final demand in the middle of the year. Other categories with favorable price developments for consumers included food and beverages, where prices rose only 1.5 percent in 2002, and apparel, where prices declined 1.8 percent. On the income side, nominal personal income rose at an annual rate of 4.5 percent during the first three quarters of 2002, and tax cuts enacted the previous year allowed consumers to keep more of their income gains for themselves. The passage of EGTRRA in 2001 reduced Federal tax liabilities by about $56 billion in calendar year 2001 and about $78 billion in 2002, helping disposable personal income, or nominal income net of taxes, to rise at a robust annual rate of 9.0 percent during the first three quarters of the year. Taken together, low price inflation and healthy growth in nominal disposable personal income meant that real disposable personal income grew at an annual rate of 7.0 percent during the first three quarters of 2002, which compares well with past recoveries. Ultimately, the strong growth in real disposable income is a reflection of the high rate of productivity growth that the Nation continues to enjoy.

The Stock Market and Consumption

One of the most closely watched influences on consumption in 2002 was the stock market, as many observers feared that continued retrenchment in equity values would dampen consumers' willingness to spend. One link between the stock market and consumption arises from the market's role as an informal measure of the strength of the economy. Because consumers often look to the stock market for information about the health of the economy, consumer attitudes from survey data have long been closely correlated with stock indexes, and that correlation remained robust in 2002. Yet the stock market is much more than an informal economic barometer. Because equity holdings are an important component of household wealth, changes in the stock market affect consumers' ability to purchase goods and services, not just their views of the future.

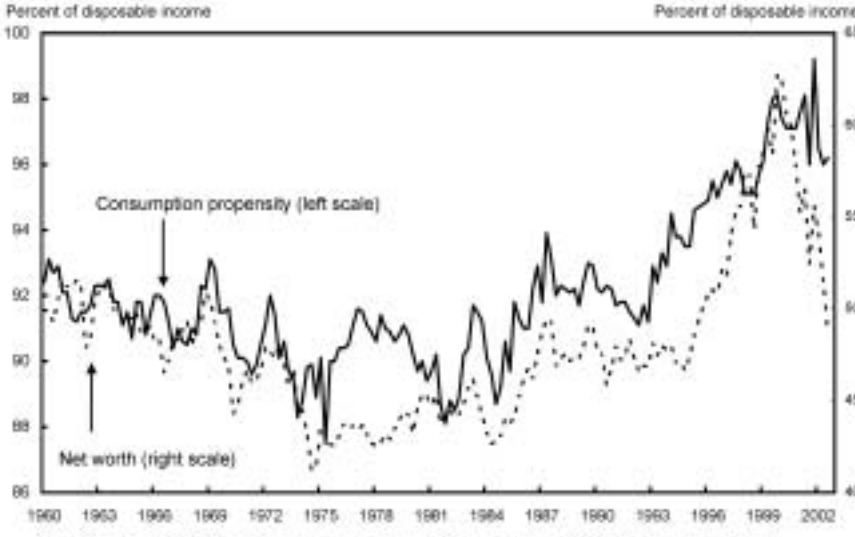
Economists have long been interested in precisely how changes in stock prices affect consumption decisions. As a matter of accounting, an increase in

an individual's wealth (equities as well as other assets) must ultimately bring about an increase in his or her consumption, unless the extra wealth is to be passed on to heirs as a bequest. The important empirical question is whether the increase in consumption occurs quickly enough for wealth to affect consumption at short horizons. The empirical relationship between aggregate wealth and the average propensity to consume out of disposable income suggests that the answer is yes, at least according to evidence through 2000. Chart 1-2 shows that as household net worth rose in the late 1990s (primarily because of the increase in stock prices), the average propensity to consume increased to levels not seen in half a century. In more sophisticated analyses that take other determinants of consumption into account, aggregate data on wealth and consumption suggest that a one-dollar reduction in stock market wealth eventually reduces yearly consumption by 3 to 5 cents.

Although economic theory suggests a direct, causal impact of stock market wealth on consumption, patterns in aggregate data do not by themselves prove that this impact exists. Wealth and consumption might move together over time because both are determined by some third factor, such as expectations about the future. Indeed, the aggregate relationship between wealth and consumption does not appear to have been very strong in the past 3 years, as wealth has declined yet the average propensity to consume has remained stable. However, recent empirical analysis using individual-level data is generally supportive of the theoretical link between wealth and consumption (Box 1-1).

Chart 1-2 **Net Worth and Consumption Propensity**

During the past four decades, net worth and the propensity to consume out of disposable income have tended to move together in aggregate data.



Sources: Department of Commerce (Bureau of Economic Analysis) and Board of Governors of the Federal Reserve System.

Box 1-1. Measuring the Effect of Stock Market Wealth on Consumption

Economists have long recognized that a close relationship between wealth and consumption exists in aggregate data, but until recently attempts to find microeconomic evidence isolating a true causal relationship between the two variables have had limited success. Part of the reason is the general difficulty of finding evidence for macroeconomic relationships in microeconomic data. Data on individual consumers are often noisy, in that period-to-period changes in their consumption are influenced by a number of idiosyncratic factors. For example, a family's decision whether to buy a new car might be influenced by an increase in stock market wealth, but also by the arrival of a new baby or the decision of one family member to take a new job. The noise problem is compounded when available datasets measure certain crucial household variables imperfectly. Most individual-level datasets are adapted from surveys or administrative data that were not expressly designed to test economic theories, and so they often omit important information, such as precise measurements of wealth holdings or consumption choices.

The noise problem in microeconomic data becomes less important if the underlying changes in macroeconomic variables are large relative to any background idiosyncrasies and measurement errors. As an example, the large runup in stock prices before March 2000 gave researchers a valuable opportunity to observe the link between wealth and consumption at the individual level. One such study found that, from 1983 to 1999, U.S. households that owned stocks did tend to consume more when stock prices rose, whereas households that did not own stocks left their consumption patterns unchanged. A second study used another dataset and focused on the second half of the 1990s, when the increase in stock prices was most pronounced. This study attempted to identify, from a number of demographic factors, those U.S. households that were likely to hold stocks, and it found that these households were the ones that increased their consumption the most during this period. Studies such as these suggest that the aggregate relationship between wealth and consumption reflects at least in part a true causal component, so that the decline in aggregate stock market wealth would be expected to slow consumption growth somewhat after the market began to decline in 2000.

If one takes the midpoint of the range noted above for the relationship between changes in stock market wealth and changes in consumption (3 to 5 cents per dollar), the $7 trillion reduction in equity wealth since early 2000 would be expected to eventually lower yearly consumption by about $280 billion. A reduction of this magnitude would have represented nearly 4 percent of consumption and almost 3 percent of GDP in 2002.

Empirical findings also suggest that the response of consumption to changes in stock market wealth is drawn out over time, and this has crucial implications for the precise path of consumption over the next few years. Because one would expect that the appreciation of equities before 2000 would still be increasing consumption today, some of the implied $280 billion drop in consumption after 2000 may simply represent a "cancellation" of a consumption increase that had not yet taken place. Moreover, positive influences from the other determinants of consumption (such as current income and the continuing appreciation in housing wealth) are likely to offset the stock market's negative effects on personal spending. For these and other reasons, private forecasters predict that actual consumption will continue to grow in the years ahead, along with GDP.

The Housing Market and Consumption

Along with healthy growth of disposable income, another positive determinant of consumption growth in 2002 was the strength of the housing market. (The sources of this strength, discussed in more detail below, include record low mortgage rates and continued growth in housing demand, fueled in part by high immigration and the demand for second homes.) Housing wealth is more widely distributed among American families than stock market wealth, and housing equity continued to rise in 2002. A common way for this equity to support consumption is through borrowing against home equity: the outstanding value of revolving home equity loans at commercial banks rose from $155.5 billion in December 2001 to $212.3 billion in December 2002. Another way that homeowners can tap the equity in their homes, for higher consumption or for spending on home improvements, is by refinancing their outstanding mortgages when interest rates have fallen. Of course, simply refinancing a mortgage at a lower interest rate can reduce monthly mortgage payments and free up extra cash. Many refinancers, however, choose to remove equity from their homes by taking out a new mortgage with a larger principal than the amount outstanding on the original mortgage. These "cash-out" refinancings boomed in 2002 as a result of the continued appreciation in housing prices and declining long-term interest rates. According to the Federal Home Loan Mortgage Corporation (Freddie Mac), holders of conventional, conforming mortgages liquefied about $59 billion in equity in the first three quarters of 2002. It is impossible

to know for certain how this money was allocated among consumption, home improvements, the paying down of nonmortgage debts, and the purchase of other financial assets. Some survey research suggests, however, that about half of this $59 billion would be allocated toward consumption and home improvements (two sources of aggregate demand), which would have raised GDP by about 0.4 percent above its baseline level through the first three quarters of the year (Box 1-2).

Finally, housing equity can also be liquefied from the sale of an existing home. Typically, the buyer of a new home takes out a mortgage that is larger

Box 1-2. Measuring the Effect of Mortgage Refinancing on Consumption

Mortgage refinancings boomed in 2002 as interest rates fell and housing prices rose. Many refinancers chose a "cash-out" option that left them a pool of funds to spend after they retired their original mortgage. A key question is how consumers used these funds: spending on consumption or home improvements would add directly to aggregate demand, whereas paying down debts, making a purely financial investment, or paying taxes would not. Some new data released in 2002 showed that the potential effect of cash-out refinancing on aggregate demand was large. According to Freddie Mac, holders of conventional, conforming mortgages cashed out $110 billion through the first three quarters of 2002, and they used about half of the proceeds ($51 billion) to pay down second mortgages or home equity lines of credit. (A conforming mortgage is one that falls within the acceptance limit for securitization by Freddie Mac or Fannie Mae, which was $300,700 in 2002.) This left a maximum of $59 billion that could be used for spending that would boost aggregate demand. The amount of funds freed up by cash-out refinancing among holders of larger mortgages is not known precisely but would add to this total.

To learn more about how this liquefied equity is being used, the Federal Reserve has sponsored occasional surveys of households to ask how they spent funds obtained through cash-out refinancing. The most recent survey covered refinancings in 2001 and early 2002. The survey found that about 16 percent of liquefied equity was used for consumption and 35 percent for home improvements, for a total of 51 percent that would add to aggregate demand. (Another 26 percent of the funds was used to pay down nonmortgage debt, and the remaining 23 percent was used to fund investments in private businesses or financial securities or to pay taxes.) These percentages are almost identical to results from an earlier survey that covered refinancings in 1998 and early 1999, which also found that about half of liquefied equity

added to aggregate demand. Allocating 51 percent of the $59 billion in cashed-out equity to demand in the first three quarters of 2002 suggests an increase in GDP of about 0.4 percent.

One reason that only a portion of the liquefied funds added to aggregate demand is that many consumers do not need to borrow against their houses to finance their spending. By taking out a nonmortgage loan or by drawing down savings, these consumers are free to adjust month-to-month spending as they see fit. Some evidence that only "liquidity constrained" consumers spend much of the funds freed up by refinancing comes from another survey, which follows a sample of families over time and has often been used to study income dynamics in the United States. In addition to its standard questions on income and spending patterns, this survey has included some questions related to refinancing activity. Using these data, researchers found that, among those who refinanced from 1991 to 1994, spending increases were far more pronounced among families that were likely to have trouble borrowing from other sources.

than that retired by the seller. The increase in net debt is often close to the seller's capital gain on the house. From the economy's point of view, such a transaction allows the capital gain to be turned into liquidity, although the seller often uses this liquidity to purchase another home. If so, this type of equity liquefaction does not raise the seller's consumption of other goods, although it may raise residential investment if the new home purchase by the seller of the original house results in a net increase in housing construction.

Nonresidential Investment

Nonresidential investment was one of the weakest components of demand in 2002. In the first three quarters of the year, business fixed investment declined at an annual rate of 3.1 percent, in large part because of a precipitous 17.8 percent fall in investment in structures. The other, larger component of business fixed investment, equipment and software, fell at an annual rate of 2.7 percent in the first quarter of the year, but then rebounded to rise at an annual rate of 5.0 percent in the second and third quarters. In light of the weak investment performance, many observers wondered whether the economy suffered from a capital overhang, built up by excessive investment in the years immediately before the 2001 recession. As discussed in last year's *Report*, this possibility is hard to verify, because it requires an estimate of the "correct" amount of capital relative to the economy's output, a figure that is hard to know with certainty. Yet as the 2002 *Report* also noted,

some empirical evidence had emerged in 2001 indicating that a modest overhang had developed the previous year for some capital goods, notably servers, routers, switches, optical cabling, and large trucks. However, evidence that a widespread overhang continues to hinder overall investment outside of a few particular industries is harder to find. In any case, the growth rate of capital services has fallen sharply over the past 2 years, from an average of more than 5.9 percent a year from 1998 to 2000 to 3.6 percent in 2001 and about 3.4 percent in 2002. This low rate of growth means that any general capital overhang that had developed by 2000 is likely to have been significantly reduced by the end of 2002.

Another important business investment development in 2002 was the change in business inventories. In 2001 firms drew down $61.4 billion in real inventories (in 1996 dollars), but real inventory investment turned positive in the second and third quarters of 2002. Although the level of inventory investment remained modest, the change in that investment after the drawdown of 2001 added several percentage points to GDP growth, especially in the first quarter. As the year drew to a close, inventory-to-sales ratios remained close to their lowest levels in years, suggesting further room for inventory expansion in 2003.

Although the short-term outlook for investment in both inventories and equipment and software is positive, the outlook for investment in structures is more uncertain. One potential positive influence on structures investment going forward is the Congress' passage of a terrorism risk insurance bill in late 2002, which will facilitate the construction of projects that are difficult to insure privately against terrorist attacks. Yet vacancy rates for both office and industrial space remained high in 2002, suggesting that the rebound in structures investment may not begin for some time.

The Stock Market and Nonresidential Investment

As noted above, one of the factors depressing business investment in 2002 was the stock market. However, the link between the stock market and investment differs from that between the stock market and consumption. An individual firm's equity value is linked to its investment not because of wealth effects, but rather because stock prices and investment are both forward-looking variables. Technically, the stock price represents the value of the future stream of dividends to be paid by the firm, discounted by a required rate of return that is appropriate for risky assets. A firm with strong future investment prospects will attract investors hoping to share in the profits generated by the firm. As these investors bid up the stocks of companies with the best investment prospects, these firms will come to have the highest stock values. Indeed, in the simplest model of business finance, stock prices and investment potential are so closely correlated that no other information besides a firm's stock price is needed to predict its investment activity.

In such a world, a firm with a high stock price can easily fund its investment projects by issuing more equity, which investors willingly absorb if they believe that the firm's investment prospects are good. In what amounts to the same thing, firms may also borrow in the capital markets to finance investment, because lenders will be able to recognize firms with favorable prospects as good credit risks. In fact, in this textbook case, the choice between equity financing and debt financing does not matter to the value of the firm. It is true that equity financing is more flexible than debt financing, because the payment of dividends is under the control of the firm, whereas the schedule of interest payments on debt is fixed at the time of the borrowing. But if individual stockholders as well as firms can borrow and lend freely in credit markets, a firm will be unable to increase its overall value simply by changing its mix of debt and equity financing. For example, a firm can raise its expected earnings per share by repurchasing some of its outstanding shares with borrowed money. But increasing the firm's exposure to credit markets in this way makes ownership in the firm riskier, which reduces the willingness of investors to hold equity in the firm. The net result is that the overall value of the firm does not increase. The firm's debt-for-equity switch affects only the fraction of its cash flows allocated toward creditors rather than shareholders. The firm's ability to carry out "real" investment projects is the same as before.

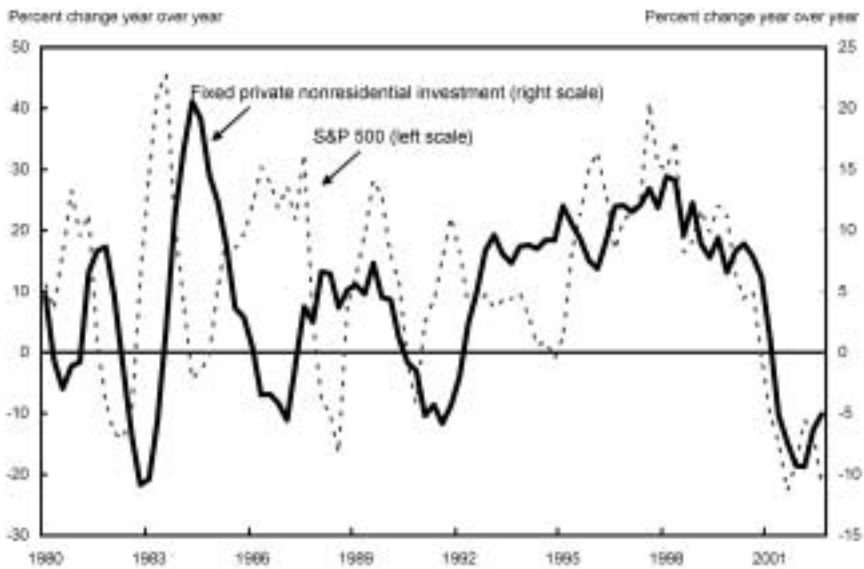
Although the U.S. stock market does provide useful signals for overall investment, the real world diverges from the textbook model in important ways. One set of complications arises because managers of the firm are typically better informed about the firm's prospects than outside investors. The resulting informational asymmetry prevents investors from attaching values to firms that perfectly reflect the firms' investment prospects, so that the close correlation between stock market values and investment found in the textbook model is lost. Another consequence of informational differences is that firms must often fund investment from internal sources (such as retained earnings or cash flow) rather than external sources (such as issuing equity or borrowing in credit markets).

A second set of complications in the financing of investment is due to the income tax. Firms are allowed to deduct interest payments as part of the cost of doing business, but dividends paid to stockholders are not granted equal treatment. As a consequence, dividend income is taxed twice, once at the corporate level and again at the level of the individual dividend recipient. This double taxation of dividends makes new equity financing less attractive to firms than debt financing. Moreover, if investors and managers do not share the same information, the resulting reliance on debt financing can have damaging consequences for investment during economic downturns. One concern is that the inflexibility of interest payments, relative to dividends, means that a recession could cause widespread liquidity problems among borrowing firms. A second problem is that, when aggregate conditions

worsen, lenders with incomplete information about firms may reduce credit to firms that are good credit risks as well as those that are bad risks. The resulting credit crunch may depress business investment by more than the economic fundamentals would warrant.

These general principles of investment and corporate finance help to illuminate recent movements in both the stock market and business investment. To start with, the correlation between the change in stock prices and growth in business fixed investment was quite close after 1995 (Chart 1-3). Although the stock market has typically been imperfectly correlated with investment over the past two decades, both variables rose markedly from 1995 to 2000 and fell sharply thereafter. One interpretation of this pattern is that although informational asymmetries and other complications can generally obscure the relationship between stock prices and investment, the rise in both reflected a widely perceived increase in the value of physical capital installed in firms after 1995. As many observers have noted, investors may have overestimated the value of installed capital in many industries, driving the stock prices of some firms to unsustainable levels and thereby encouraging these firms to invest too much. Even so, capital markets worked well in the late 1990s, in the sense that the signals sent by market participants and manifested in stock prices were received clearly by investing firms.

Chart 1-3. **Equity Prices and Fixed Private Nonresidential Investment**
Unlike in earlier periods, the stock market and investment moved closely together after 1995.



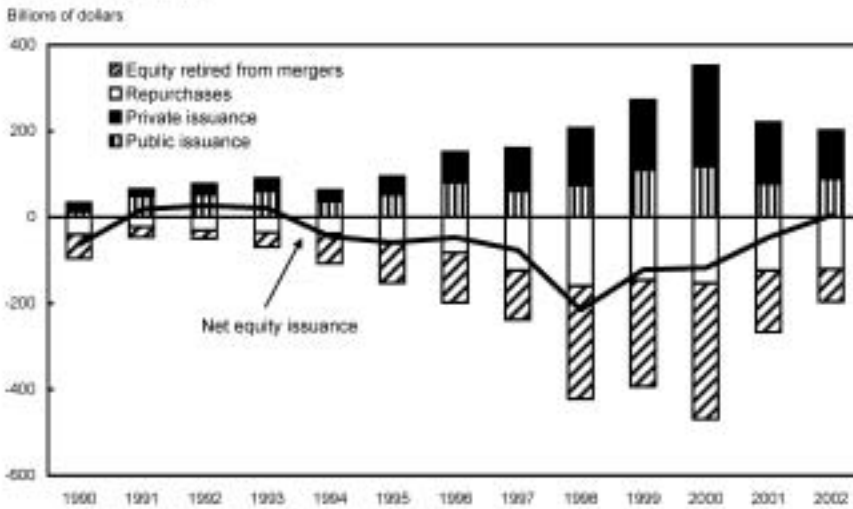
Sources: Department of Commerce (Bureau of Economic Analysis) and Standard & Poor's

The boom in the stock market might have been expected to encourage firms to finance investment by issuing equity, but it turns out that net issuance of equity was actually negative in the late 1990s (Chart 1-4). To be sure, many firms did issue equity in order to finance new investments, through initial public offerings as well as the private venture capital market, both of which surged through 2000. Yet these gross equity issues were more than offset by share repurchases and merger-based stock retirements at other firms, so that debt, not equity, served as the major source of business financing during the investment boom. Business debt rose steadily throughout this period, with net issuance of long-term corporate bonds and short-term commercial paper playing especially important roles (Chart 1-5). Of course, a major reason for this pattern of rising debt alongside a booming stock market was that discussed above: the bias toward debt financing built into the tax code.

In a general sense, the decline in the stock market after early 2000 can be traced to both of the factors that determine equity prices: expectations of future corporate earnings, and the risk premium that investors require in order to hold equities. Evidence that expectations of earnings growth were adjusted downward as the stock market fell comes from surveys of Wall Street analysts who track individual firms. According to one such survey,

Chart 1-4 **Nonfinancial U.S. Equity Issuance**

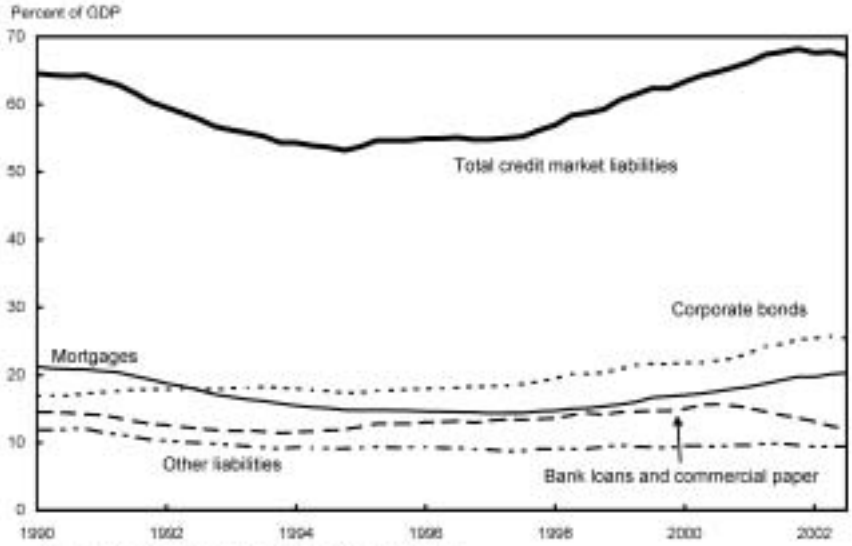
Though the booming stock market reduced the cost of equity capital to firms, net issuance of equity was negative in the late 1990s. More stock was retired through mergers and stock repurchases than was issued either publicly or privately.



Note: Data for 2002 are for the first half at an annual rate.

Source: Board of Governors of the Federal Reserve System.

Chart 1-5 **Credit Market Liabilities of the Nonfinancial Business Sector**
Although bank loans and commercial paper have declined in recent years, increases in longer term debt have kept total business debt stable.



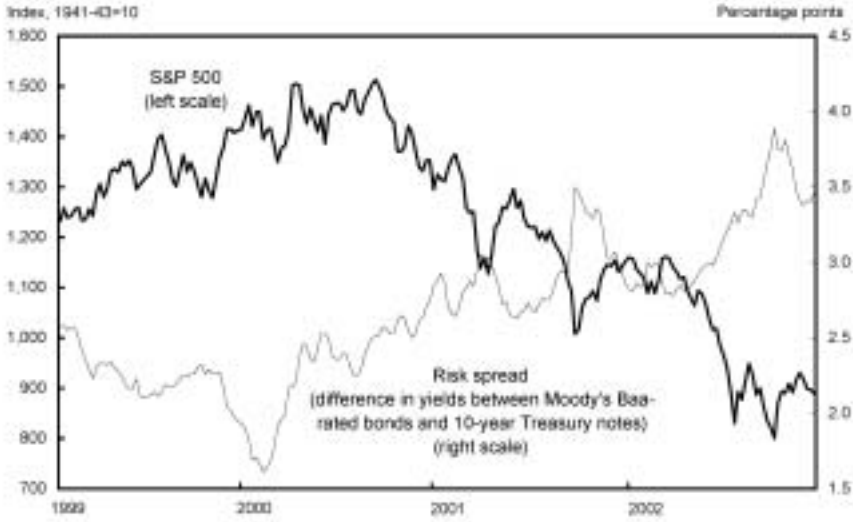
Source: Board of Governors of the Federal Reserve System.

5-year-ahead earnings growth forecasts for the firms in the Standard & Poor's 500 index fell from a peak of more than 18 percent in mid-2000 to slightly more than 13 percent by September 2002. Other data provide evidence of an increase in market aversion to risk, which lowers the price that investors are willing to pay for a stream of uncertain corporate earnings. A common measure of the market's aversion to risk is the interest rate spread between corporate bonds and U.S. Treasury bonds, because corporate bonds are subject to default risk whereas Treasuries are not. The widening gap between yields for corporate and Treasury securities after 2000 coincided closely with the decline in the stock market during this period (Chart 1-6). Spreads continued to widen sharply in 2002, reaching near-record levels, indicating that risk aversion played a key role in markets in the months following September 11, 2001.

In addition to reductions in both earnings expectations and risk tolerance, corporate governance was an often-cited factor in the stock market's behavior in 2002. Well-publicized allegations of corporate wrongdoing and questionable accounting practices may have caused investors to doubt the reported earnings of some firms. One way to gauge the seriousness of corporate governance concerns in 2002 is to examine the interest rate spreads *within* the investment-grade corporate bond market and, specifically, the difference between interest rates paid by the highest-rated corporate borrowers and those paid by firms with somewhat lower credit ratings. As Chart 1-7 shows,

Chart 1-6 **Equity Markets and Risk Spreads**

The decline of the stock market after 2000 coincided with an increase in risk spreads, suggesting that investors became less willing to hold all risky assets over this period.

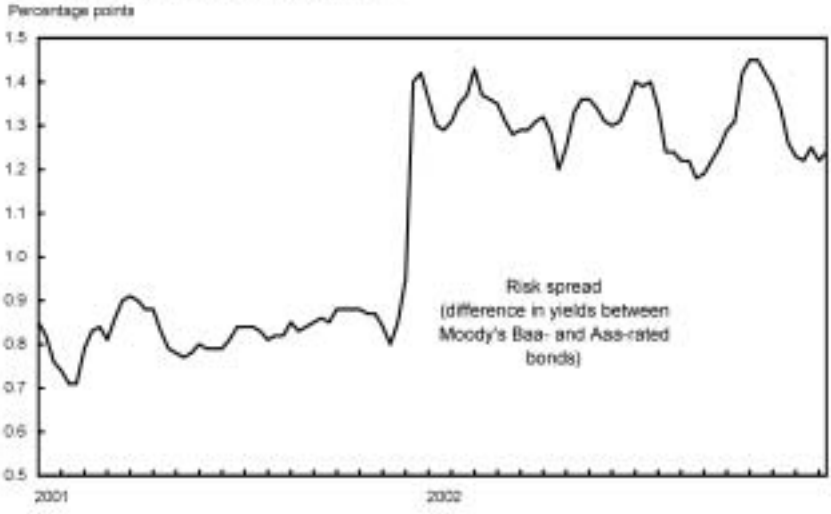


Note: Weekly data.

Sources: Department of the Treasury, Moody's Investors Service, and Standard & Poor's.

Chart 1-7 **Corporate Bond Risk Spreads**

Concerns over corporate governance and economic growth contributed to a widening of bond spreads within the corporate sector in late 2001.



Note: Weekly data.

Source: Moody's Investors Service.

this spread widened sharply in the closing months of 2001. Although this period was one of heightened uncertainty over the pace of near-term economic growth, it also featured a number of important allegations of corporate misbehavior, and the widening bond spread suggests that investors became less willing to tolerate relatively high levels of risk at less-than-premium-grade firms as 2002 began.

Although the effect of these revelations on interest rates and bond prices appears pronounced, their effect on broad equity price indexes in 2002 is less clear. To be sure, the revelations of questionable practices had important consequences for the stock prices of many firms. Regarding the U.S. stock market as a whole, however, it is important to recall, as noted above, that all of the world's major stock markets lost ground in 2002. The precise determinants of these movements are difficult to identify, but the uniformity of stock market movements around the world suggests that a key driver of U.S. stock prices in 2002 was a worldwide decrease in tolerance for risky assets combined with lower projected earnings growth, and not necessarily the corporate governance concerns specific to the United States.

As discussed in Chapter 2, government plays an important role in the regulation of corporate behavior, complementing the monitoring mechanisms for invested funds that arise naturally in well-developed financial markets. In March 2002 the President offered a 10-point reform plan addressing a wide range of corporate governance issues, and in July he signed the landmark Sarbanes-Oxley Act. The quick response to the accounting scandals signaled by passage of this act underscored both the seriousness of corporate responsibility issues and the importance of maintaining confidence in markets.

Given the link between investment and stock prices discussed above, it should not be surprising that investment softened considerably after early 2000. A key question was whether the temporary slowing of economic growth would combine with the business sector's reliance on debt financing to engender a liquidity crisis or a credit crunch, either of which would depress investment even further. By and large, however, credit markets in 2001 and 2002 continued to function without the sharp increase in the nonprice rationing of credit that is typical of a credit crunch. Short-term business lending did decline in 2001 and 2002, as both commercial paper and commercial and industrial (C&I) bank loans fell. (See Chart 1-5 above.) By itself, however, a decline in lending is not evidence of a credit crunch, in which loans are no longer allocated by price and creditworthy firms are denied loans at posted interest rates. Although nonfinancial business debt as a percentage of GDP has declined somewhat over the past year, this decline has been less severe than during many other business cycles. It is true that C&I loans and short-term commercial paper outstanding have fallen sharply,

but many firms have simply substituted long-term bonds for commercial paper in order to reduce rollover risk and lock in favorable long-term interest rates. Corporate bond issuance was especially strong in 2001, before the increase in borrowing spreads within the corporate sector (portrayed in Chart 1-7) raised borrowing costs for firms that lacked the highest credit ratings. Another factor leading to reduced bank lending was the general decline in business loan demand that typically accompanies economic downturns. Specific evidence for a decline in loan demand comes from an October 2002 Federal Reserve survey, which found that senior loan officers at most domestic banks put a decline in loan demand, not restrictions in loan supply, at the heart of the decline in bank lending to businesses.

The relative stability of the business debt-to-GDP ratio in the aftermath of the 2001 recession contrasts sharply with the decline in debt that followed the 1990-91 recession, when many feared that a credit crunch had taken hold. As can be seen from Chart 1-5, the earlier debt decline was strongly influenced by a sharp decline in commercial mortgages. This drop in mortgage credit was, in turn, prompted by an earlier change in the tax code that made commercial real estate investments less attractive on a purely tax basis, as well as by continuing weakness in the savings and loan industry. Because these headwinds to debt accumulation are not relevant for the current period, it is much less likely that a sustained deleveraging of the corporate sector like that observed in the early 1990s now lies ahead for the U.S. economy.

In summary, the link between stock prices and business investment has proved especially strong since 1995. Both the stock market and business investment reflected the optimism of investors in the late 1990s, and both reflected the subsequent scaling back of expected profits as well as reduced tolerance for risk. Yet even though the investment boom of the late 1990s was funded primarily with debt and not equity, the drop in equity values did not degenerate into a full-blown credit crunch that hindered investment unnecessarily. As a result, rationing of credit is not expected to hinder the investment recovery that private forecasters predict for the coming year.

Residential Investment

In contrast to the softness in nonresidential investment, residential investment grew briskly in 2002, sparked by the lowest mortgage interest rates in more than a generation. After hitting a recent peak of 8.64 percent in May 2000, interest rates for conventional, fixed-rate 30-year loans fell to 5.93 percent by the end of December 2002, their lowest level since 1965. Low mortgage rates contributed to the 6.8 percent increase in single-family housing starts over their already high level of 2001, while boosting sales of new homes to record levels near the end of the year. The strength of housing construction during

Chart 1-8 **Housing Starts**

In contrast to their performance in past downturns, housing starts remained robust during the 2001 recession.

Note: Shaded areas represent past recessions.

Sources: Department of Commerce (Bureau of the Census) and National Bureau of Economic Research (NBER).

the past 3 years stands in contrast to past business cycles, when housing starts were not nearly as robust (Chart 1-8).

Strong housing construction is also a natural consequence of rising housing prices, although that rise moderated to an annual rate of 3.4 percent in the third quarter of 2002 from an annual rate of about 9 percent in the first half of the year. The continued appreciation of housing during the last several years has led some observers to contend that the housing market is caught in a bubble, in which buyers pay high prices for assets simply because they hope to sell those assets to other investors at even higher prices, a scheme that collapses quickly when no further purchasers can be found. Proponents of the housing bubble theory noted that houses were particularly expensive relative to rents, which indicated that high shelter costs alone did not explain the entire rise in housing prices. Housing prices also rose much more quickly than the median household income in 2001, which left the price-to-income ratio at its highest level in more than two decades.

Because it is difficult to know the precise motivations of the millions of persons who buy homes (or any other assets), it is impossible to know for sure whether any sharp increase in home prices is a bubble. Yet the high transactions costs involved in selling houses make a bubble in the housing market unlikely. Moreover, new sources of housing demand have emerged in the past two decades to support the fundamental value of owner-occupied

houses. One is the growth in purchases of second homes by baby-boomers, many of whom are now in their prime earning years. Perhaps more important is the recent surge in immigration into the United States. In the 10 years preceding the 2000 Census, the number of foreign-born residents in the United States rose by 11.3 million, or 57 percent, compared with an increase of only 5.7 million in the previous 10-year period. As a result, the share of foreign-born individuals in the total U.S. resident population reached 11.1 percent in the 2000 Census. This is well above their 4.7 percent share in 1970 and comparable to the 13 to 15 percent shares recorded during the golden age of immigration from 1860 to 1920.

By itself, a surge in immigration would be expected to raise shelter costs in general, but not necessarily the price of homes relative to rents. Yet there is evidence that the timing of the immigration wave, along with recent developments in mortgage finance, has raised demand for owner-occupied homes separately from the demand for rental housing. Some recent research has pointed out that immigrants who arrived in the 1980s have only recently been able to make the transition to home ownership, because it takes time to save for a down payment. Also, developments in mortgage finance over the 1990s have made home purchases more affordable by narrowing the spread between mortgage interest rates and benchmark U.S. Treasury yields. The liberalization of mortgage finance would be expected to exert a strong, independent effect on home demand, by enlarging the pool of potential buyers of any nationality. This liberalization could well have combined with improvements in the financial positions of previous immigrants to result in a strong source of housing demand in the past several years. According to the 2001 American Housing Survey, sponsored by the Department of Housing and Urban Development, foreign-born residents have accounted for a sizable share of first-time home purchases since 1997, when the increase in house prices began in earnest. The survey shows that there were more than 5.7 million foreign-born homeowners in the United States in 2001, and more than 20 percent of them had purchased their first house since 1997. Although many of these new homeowners were members of minority groups, the rate of homeownership among minorities still lags behind that of whites. To redress this imbalance, in June 2002 the Administration announced an initiative to add 5.5 million minority homeowners by the end of the decade.

Net Exports

Although the output of the U.S. economy remained below potential in 2002, its growth rate still outpaced those of many other industrialized countries. Slow growth among many of the United States' major trading partners, in turn, contributed to slow growth in U.S. exports compared with that of

imports. Exports rose at an annual rate of 7.4 percent during the first three quarters of the year, while imports grew 11.1 percent. This discrepancy between the rates of growth in exports and imports led to an increase in the U.S. trade deficit, so that net exports exerted a drag on GDP growth in the first half of the year. (Net exports were essentially unchanged in the third quarter.)

Because changes in the trade deficit are often quantitatively important for year-to-year changes in GDP growth, U.S. trade performance is an important concern. Imports and exports both provide benefits to consumers and firms. Imports provide U.S. firms with a wider variety of low-cost inputs, and consumers with wider variety and lower prices for goods. Moreover, competition from international producers induces domestic firms to raise their productivity, which raises incomes in the long run. Trade therefore boosts consumer satisfaction at home and ensures that American producers remain competitive, by increasing the size of the market in which they operate. In light of the benefits of trade to both Americans and foreigners, the Administration has made the expansion of trade a central policy objective. Two important trade-related developments in 2002 were the Congress' granting of Trade Promotion Authority to the President (after an 8-year hiatus) and the launching of an ambitious initiative to reduce barriers to agricultural trade, announced at the ongoing Doha round of trade negotiations within the World Trade Organization. These developments and others are described in more detail in Chapter 6, which discusses the importance of free trade measures in promoting economic growth around the world.

Government Purchases

The war on terrorism continued to exert upward pressure on Federal Government purchases in 2002. In late March the President requested that the Congress provide an additional appropriation of $27.1 billion, primarily to fund this effort. More than half of this amount was allocated to activities of the Department of Defense and various intelligence agencies. Most of the rest was needed for homeland security (mainly for the new Transportation Security Administration) and for the emergency response and recovery efforts in New York City. Although most of this spending was required for one-time outlays only, it nevertheless contributed to the 6.4 percent annual rate of increase in real Federal Government purchases in the first three quarters of 2002. State and local government purchases rose at a more moderate 1.7 percent annual rate during the same period.

The Labor Market, Productivity, and Real Wages

Although the labor market improved in 2002 after weakness in the wake of the September 2001 attacks, most major labor market indicators showed little progress over the course of the year. The unemployment rate hovered between 5.5 and 6.0 percent throughout the year, after rising 1.8 percentage points in 2001. Nonfarm payroll employment in 2002 was similarly weak, with 181,000 jobs lost during the year, compared with 1.4 million jobs lost the previous year.

As in past business cycles, the decline in manufacturing employment has been especially pronounced. Factory employment fell by 592,000 in 2002, following a decline of 1.3 million in 2001 and about 100,000 in 2000. Another feature of previous business cycles that has recurred in the past 2 years is the increase in the number of workers who report a long unemployment spell. Like the overall unemployment rate, the number of workers unemployed for 26 weeks or more rose in 2001 and remained high in 2002 (Chart 1-9). The rise in long-term unemployment is one of the most troublesome features of recessions, because long-term joblessness is costly to those unable to find work. Indeed, the difficulties endured by the long-term unemployed were a key reason for the passage of the Job Creation and Worker Assistance Act in March, which extended unemployment benefits for many of these workers. Yet, as Chart 1-9 shows, the pattern of long-term unemployment observed in 2001 and 2002 was similar to patterns traced out in previous postwar fluctuations.

In other ways, however, the recent behavior of the labor market has been different from that in past business cycles. One difference is the high fraction of job losers who reported a permanent rather than temporary separation in 2001. In the government's monthly Current Population Survey, each respondent who reports a job loss is asked whether he or she expects to return to work with the same employer. (Those who expect to return are typically on an explicitly temporary layoff, although this need not be the case.) Research from the Bureau of Labor Statistics found that, in the initial quarters of the four recessions before 1990, slightly more than half of job losers were permanently separated from their previous employers, with the rest on temporary layoff. In the three quarters after the business cycle peak of 1990, however, the share of permanent job losers rose to almost three quarters, and the comparable proportion for the March 2001 peak is nearly 90 percent.

The rising proportion of job losers facing a permanent separation in recessions may reflect structural changes in the labor market during the past two decades, including the rise in temporary help employment. A firm facing a transitory increase in demand may use a temporary worker (formally employed by a temporary help firm) rather than add staff to its regular work

Chart 1-9 **Duration of Unemployment**

The increase in long-term unemployment in the most recent business cycle is typical of postwar recessions.

Note: Duration-specific unemployment is seasonally adjusted independent of total unemployment.
Source: Department of Labor (Bureau of Labor Statistics).

force. When demand falls, the firm would then permanently sever the relationship with this worker; in the past the firm might have placed one of its own workers on temporary layoff. This explanation is consistent with the sharp rise in temporary help employment over the past 20 years as well as the sharp drop in 2001. Yet it is important to keep in mind that the fraction of workers losing their jobs in 2001 remained well below that in recent recessions, because of the mildness of the 2001 contraction.

Although year-to-year fluctuations in the labor market are of immediate concern, sustained improvements in the living standards of American workers depend on more structural, long-term factors. As discussed in Chapter 3, these factors include the flexibility and dynamism of the American labor market, which matches millions of workers with new jobs each month and provides incentives for investments that make workers more productive. Indeed, pro-growth labor market policies in the United States have helped the economy achieve a sizable increase in labor productivity growth since 1995. When this increase began, many economists were skeptical that it was permanent, because productivity growth in a given quarter or year can be strongly influenced by the business cycle. Indeed, macroeconomic research has long established the procyclicality of productivity as a stylized fact, with output per worker rising faster in expansions than in recessions. This productivity pattern can be explained by the reluctance of firms to hire early in a recovery, before

they are sure that a robust recovery has taken hold. This reluctance means that existing employees must work harder to fill the higher number of orders when demand first begins to rise. The resulting increase in worker effort causes output to rise faster than hours worked, so that the data indicate an increase in productivity even without any improvement in the underlying technology of production. Economists therefore prefer to observe improved productivity performance over an extended period before pronouncing that a change in productivity growth has taken place.

As productivity growth has stayed high since 1995, the productivity improvement has increasingly come to be seen as lasting. Data from 2001 and 2002 only strengthen this conclusion. During the seven quarters ending in the third quarter of 2002—a period that includes a recession and a recovery—labor productivity grew at an annual rate of 3.2 percent, somewhat higher than the annual rate of 2.5 percent from 1995 to 2000 and much higher than the 1.4 percent trend from 1973 to 1995. (A formal analysis of recent productivity data is presented later in the chapter.) An improvement of only about 2 percentage points in productivity growth may not sound impressive, but over time even a small increase in productivity growth brings about a large improvement in living standards. For example, growth in productivity of 1.4 percent a year implies that productivity doubles every 50 years, but growth of 2.5 percent implies a doubling every 28 years.

Strong productivity growth also helps to keep inflation down, by allowing real wages to grow without an increase in unit labor costs, which would drive up firms' costs of production and therefore push output prices upward. Indeed, another bright spot in 2002 was the behavior of inflation and real wages. The consumer price index (CPI) rose 2.4 percent in 2002 (December to December), close to its 1.6 percent rate of increase in 2001. The core CPI, which does not include the volatile food and energy components, rose 1.9 percent.

Inflation is difficult to measure, because of the dynamic nature of consumers' choices (Box 1-3), and it is not directly linked to long-run living standards. Nonetheless, low inflation is fundamental to a healthy economy. High and variable inflation not only can cloud the relative price signals needed to allocate resources efficiently, but also can introduce other distortions through the income tax. Additionally, bringing inflation down from high levels typically requires sustained (and costly) increases in unemployment. The low inflation observed in 2002 gave policymakers the flexibility to support the fledgling recovery without being overly concerned that they would increase price pressures in doing so.

Taken together, rapid productivity growth and low inflation meant that real wages continued to grow in 2002. As measured by the employment cost index, real compensation for private industry workers grew 2.1 percent over the four quarters ending in the third quarter of 2002. This compares with

Box 1-3. New Measures of Consumer Price Inflation

Following through on a request from the Congress, the Bureau of Labor Statistics has developed a new measure of consumer price inflation. Unlike the current official Consumer Price Index for Urban Consumers, the new measure not only adjusts for consumer substitution between goods in response to movements in relative prices, but also uses current expenditure weights rather than weights that are several years out of date. The fact that weights from different adjoining years are "chained" together gives the new measure of inflation its name: the chained CPI, or C-CPI. The chained CPI is a supplemental series and is not intended to replace the official CPI, versions of which are used to index Social Security benefits, pensions, Federal tax brackets, and many private contracts.

Any consumer price index must somehow aggregate the many prices faced by consumers into a single number. The official CPI aggregates prices by using a fixed market basket. (Currently the basket reflects consumption shares in 1999-2000 for 211 major categories of goods and services.) The disadvantage of using a fixed-weight basket is that the resulting price index is unable to reflect the reallocations that consumers make when relative prices change. For example, if the price of chicken were to rise while that of steak held steady, consumers might well buy more steak; then the use of fixed weights would overstate the increase in the cost of meat generally, caused by the increase in the cost of chicken. The new chained index reflects this substitution, but at some cost. Specifically, the new index requires data on consumer expenditure before *and after* these substitutions have occurred. But whereas prices are relatively easy to measure on a real-time basis, expenditure shares are not, which means that current expenditure shares must be estimated for the most recent periods.

Because it reflects substitution by consumers, the new measure uses expenditure weights that are constantly changing as consumption patterns change. As a result, the expenditure weights do not get out of date as they do with a fixed-weight index. The difference that this use of up-to-date weights makes is particularly important to the contribution of computers to the cost of living, because the relative price of computers has fallen during the past two decades even as the expenditure share of computers has risen. A fixed-weight basket would tend to understate the weight of computers in current consumption, because its expenditure weights are typically years out of date. As the price of computers has fallen over time, the underweighting of computers in a fixed-weight index causes this index to overstate the increase in the cost of living. The chained CPI does not suffer from this problem, because its weights are constantly being updated.

real compensation growth of only 1.3 percent during the same period a year earlier. Although increases in benefits (such as employer payments for health insurance) accounted for much of the acceleration in total compensation growth, annualized real growth in wages and salaries also accelerated, from 0.9 percent to 1.7 percent across the same two periods.

In short, the sluggish performance of the labor market in 2002 was an unwelcome development for many workers and their families, as well as a matter of concern for policymakers. But rapid productivity growth, low inflation, and healthy real wage gains set the stage for future improvements in both unemployment and job growth in the years ahead.

Macroeconomic Policy and the Budget Outlook

The U.S. economy has suffered a number of serious setbacks in the past 3 years, including the terrorist attacks of September 2001, the significant loss of stock market wealth since 2000, and the recent corporate accounting scandals. Yet the contraction of 2001 was one of the mildest on record, with recovery proceeding steadily, if modestly, in 2002. One reason for the economy's stability in the face of these adverse developments was the stance of macroeconomic policy, both monetary (set by the Federal Reserve) and fiscal (set by the President and the Congress). This section analyzes the effects of monetary and fiscal policy in detail, illustrating their likely impact on macroeconomic performance in 2002 as well as the fiscal outlook for the years ahead.

Monetary Policy

In 2001, faced with signs of a slowing of economic activity, the Federal Reserve reduced its policy interest rate, the Federal funds rate, 11 times during the year, from 6.50 percent to 1.75 percent. The Federal Reserve then held the funds rate steady through most of 2002, until a further half-percentage-point cut on November 6 brought it down to 1.25 percent. Although the Federal funds rate thus remained constant for most of 2002, earlier rate reductions continued to stimulate the economy throughout the year. Understanding the reasons for this lag requires an understanding of the channels through which monetary policy affects the economy. A lowering of interest rates stimulates demand through four main channels: encouraging consumption (particularly of durables), stimulating business investment (by lowering the cost of capital), promoting residential investment (as seen from the booming housing sector), and lowering the foreign exchange value of the dollar (which tends to raise exports and lower imports). All of these effects take time to be felt. Consumers must plan how best to take advantage of

lower borrowing costs, firms must plan new investments, and importers and exporters must determine how any change in the dollar's exchange value will affect their prices and costs.

Measuring the size of these effects as well as the time needed for them to be fully expressed is an active area of macroeconomic research. One method for measuring the effect of monetary policy uses formal models of the economy, in which the behavioral relationships governing consumption, investment, imports, and exports are fully specified. After the researcher specifies a time path for the Federal funds rate, the model supplies the likely path for each component of aggregate demand, based on the behavioral relationships embedded in the model's equations. In contrast to this model-based method, a more data-based method for measuring the effects of monetary policy omits any formal modeling of behavioral relationships, instead using statistical techniques to measure the past effect of funds rate changes on a few key variables, such as output and the price level. An important goal of this method is to take account of other factors, such as changes in fiscal policy and temporary shocks to aggregate demand and prices, which may also have affected the economy when a given change in monetary policy was taking place. Although the precise channels of monetary policy are not specified in the data-based method, it is hoped that the answers are less sensitive to particular assumptions, which can differ across large behavioral models.

Results from both model-based and data-based methods suggest that monetary policy changes take effect only after a lag of several months, but that these effects are long-lasting, so that the rate reductions in 2001 are likely to have stimulated the economy throughout 2002. To gain a sense of the magnitudes involved, one well-known model of the economy predicts that, holding other factors constant, a 1-percentage-point decrease in the Federal funds rate raises real GDP by 0.6 percent above its baseline level after 1 year. This effect of monetary stimulus on real GDP rises to 1.7 percent after 2 years. Data-based methods broadly concur with this assessment: one study shows that the typical decrease in the funds rate raises output steadily in subsequent quarters, reaching a maximum effect on output after about 18 months. Both methods therefore imply that interest rate cuts in 2001 continued to exert considerable economic stimulus in 2002.

Fiscal Policy

An important goal of fiscal policy is to promote growth by limiting the share of output commanded by the government. In 2001 the Congress and the Administration made major progress along these lines with passage of the Economic Growth and Tax Relief Reconciliation Act, which featured a broad-based cut in marginal tax rates. The long-term benefits of such a policy

are clear, as high marginal tax rates discourage the entrepreneurship and risk taking on which the strength of the U.S. economic system depends. Yet although the goal of EGTRRA was to improve long-term living standards and limit the size of the government, the legislation conferred important short-term benefits as well, thanks to the way in which the tax rate reductions were set in place and the timing of the act's passage. A new lower tax rate of 10 percent was introduced at the bottom range of the previous 15 percent bracket, and taxpayers in 2001 were given an advance rebate on their likely savings due to this reduction.

Rebate checks ($300 for most single taxpayers, $600 for most married couples filing jointly) arrived in mailboxes in the summer of 2001. The timing of the resulting $36 billion infusion of spendable income into the economy could not have been more favorable. Although the depth of the 2001 recession would not be known until revised GDP figures were announced the next year, GDP had already declined by 0.6 percent at an annual rate in the first quarter of 2001 and by 1.6 percent in the second quarter. As estimated from the traditional relationship between overall GDP and current income, the tax plan added about 1.2 percentage points of growth at an annual rate in the third quarter. As a result, without the checks, third-quarter GDP would have declined at an annual rate of 1.5 percent rather than the 0.3 percent rate actually observed. In the fourth quarter, tax relief continued to add 1.2 percentage points to the annual rate of real GDP growth, so that instead of rising at an annual rate of 2.7 percent, GDP would have risen by only 1.5 percent in the absence of the rebates.

The rebate checks mailed in 2001 represented only a small fraction of the tax relief from the EGTRRA package. In addition to lowering marginal tax rates, EGTRRA increases the incentives for saving, for making bequests to heirs, and for investment. As a result, tax relief from EGTRRA probably helped the private sector create 800,000 jobs by the end of 2002 relative to the baseline level without tax relief, while raising GDP growth by about 0.5 percentage point over the course of that year.

In March 2002 the President signed the Job Creation and Worker Assistance Act, which implemented a tax policy especially appropriate for the fledgling recovery. The act promoted investment by allowing firms to immediately write off (that is, expense) 30 percent of the value of qualified investments in the year of purchase for investments made through September 11, 2004. As discussed in Chapter 5, government policies can significantly improve growth by removing tax distortions that penalize investment or other productive activities. For example, introducing expensing lowers the cost of capital, thereby making more investment opportunities profitable on an after-tax basis. The act stimulates investment by allowing partial expensing through most of 2004. In addition to reducing the tax-adjusted cost of investment, the act extended

unemployment benefits to workers who have exhausted their regular benefits. This enhanced the role of unemployment insurance as one of the economy's most important automatic stabilizers.

The Federal Budget

After 4 years of surpluses, the unified Federal budget recorded a deficit of $158 billion in fiscal 2002, or about 1.5 percent of GDP. The return of the deficit was primarily due to four factors: the lingering effects of the recession of 2001, the stock market plunge, increased Federal expenditure necessitated by the war on terrorism, and the costs of homeland security. Recessions tend to increase budget deficits because they lead to higher outlays (for unemployment insurance, for example) at the same time that they reduce tax receipts (because taxable income falls). The decline in receipts during the most recent downturn in the business cycle has been especially pronounced. Total receipts in fiscal 2002 were $1,853 billion, having fallen $138 billion, or about 7 percent, from their level in fiscal 2001. This represented a much larger percentage decrease in receipts than in previous, far more severe recessions. One of the most important reasons for the dramatic decline in receipts given the mildness of the 2001 contraction was the coincident decline in the stock market. The stock market's decline reduced capital gains receipts in addition to reducing taxes on wage and salary income for workers whose jobs are closely tied to equity markets. More detailed information on the precise sources of the decline in receipts will not be available until the Treasury completes its regular annual examination of individual tax returns. Even with the decline in receipts, however, the budget deficit was relatively small as a fraction of GDP compared with those seen in previous periods of war and recession.

The President's Jobs and Growth Initiative

On January 7, 2003, the President proposed a plan to enhance the long-term growth of the economy while supporting the emerging recovery. At the start of 2003 the consensus of private forecasters predicted accelerating growth in real GDP over the course of the year, which would raise investment, reduce unemployment, and increase job growth. This consensus view is reflected in the Administration's outlook, discussed below. Yet the recovery in investment could be delayed by weaker-than-expected profit growth, higher required rates of return arising from geopolitical and other risks, or a prolonged period during which companies focus on repairing their balance sheets. More general risks to recovery in 2003 include an increased sense of caution, which could lead households to pull back on their spending plans, and the potential for further terrorist attacks. To insure against these

near-term risks while boosting long-term growth, the President has proposed a focused set of initiatives. Specifically, the President's plan would:

- Accelerate to January 1, 2003, many features of the 2001 tax cut that are currently scheduled to be phased in over several years. These include the reductions in marginal income tax rates, additional marriage penalty relief, a larger child credit, and a wider 10 percent income tax bracket
- Eliminate the double taxation of corporate income by excluding dividends from individual taxable income
- Increase expensing limits for small business investment, raising to $75,000 the amount that small businesses may deduct from their taxable income in the year the investment takes place
- Provide $3.6 billion to the States to fund Personal Reemployment Accounts for unemployed workers. These accounts would allow eligible workers to spend up to $3,000 to defray the costs of finding or training for a new job. Workers could keep any unspent balance in their account if they find work within 13 weeks of going on unemployment.

Accelerating the marginal tax rate reductions would insure against a softening of consumption by putting more money in consumers' pockets through long-term tax cuts, which have been shown to be more effective than temporary cuts in boosting near-term spending. Ending the double tax on corporate income would increase the ability of corporations to raise equity capital, providing near-term support to investment while improving the long-term efficiency of capital markets. (For more on how eliminating the double tax on corporate income would help the economy, see Chapter 5.) The provisions also support investment by small firms. Higher expensing limits would make it easier for small firms to expand by reducing the tax-adjusted cost of capital; lower marginal tax rates would increase growth incentives for small business owners whose business income is taxed at individual rates. Finally, Personal Reemployment Accounts, discussed in more detail in Chapter 3, would provide unemployed workers with a new set of incentives as they look for work. Accounts of this type, which reward unemployed workers for finding jobs quickly, have been shown in experiments in several States to increase the speed with which unemployed workers find new jobs. Moreover, by allowing workers a choice between using the funds to support their job search and using them for job training expenses, the accounts are well suited for the dynamic U.S. labor market.

The Effect of Tax Relief on Interest Rates

One of the most widely discussed issues in fiscal policy concerns the effect of tax relief on interest rates. It is widely agreed that, in the immediate

aftermath of a permanent tax cut, consumption increases because consumers have more disposable income. This increase in consumption raises GDP in the near term, especially if the economy is operating below its potential, with large amounts of unused labor and capital. In the long run, lower tax rates have somewhat complicated, offsetting effects on GDP. On the negative side, if the reduction in tax rates is not accompanied by spending reductions, it will increase the budget deficit and may reduce national saving. Lower national saving, in turn, will shrink the pool of loanable funds available in capital markets, which increases interest rates and reduces investment. Ultimately, lower investment leads to a smaller stock of productive capital, resulting in lower wages, lower productivity, and lower output. Offsetting this, however, is the positive effect of tax relief that operates through improved incentives to work and take risks, for example by creating a new firm or by making a new investment. Incentives to undertake these activities improve after a cut in marginal tax rates, because the tax reduction allows more of the rewards to be captured by workers, entrepreneurs, and investors and not by the government. When tax relief extends to capital income (such as dividends), as proposed in the President's most recent jobs and growth initiative, an additional positive effect arises through stronger incentives to save. These positive effects on GDP operating through improved incentives also have an impact on future budget deficits and investment, because deficits will be less onerous if the economy grows in response to the improved investment climate.

Assessing the ultimate effect of tax relief on GDP and future government debt thus requires gauging both the negative effects that arise through higher interest rates and the positive effects that come from improved incentives. Unfortunately, measuring the effect through incentive channels is difficult, because there have been few episodes of large, broad-based tax relief during the last several decades. Moreover, even these historical episodes occurred amid a host of other economic developments, making it difficult to isolate the direct effect of lower taxes on working and saving.

Obtaining a rough estimate of the interest rate effect is less difficult, because widely accepted economic theory allows precise predictions of how much an increase in the stock of debt should affect interest rates. The first step in making this calculation is to note that an additional dollar of government debt does not reduce the capital stock by a full dollar. About 40 cents of the additional debt will be offset by larger capital inflows from abroad, so that the U.S. capital stock would fall by only about 60 cents. The next step is to translate this 60-cent-per-dollar decrease in the capital stock into an ultimate change in long-term interest rates. This is done by noting that the interest rate on a bond should be closely related to the marginal product that physical capital earns in the marketplace. This is so because the two should converge to

the point where investors are indifferent between holding financial securities or holding physical capital in their portfolios. Reducing the physical capital stock will increase the marginal return to capital in the marketplace by making capital scarce relative to other factors of production; the key question is by how much this marginal return rises. Some calculations (shown in Box 1-4) imply that interest rates rise by about 3 basis points for every $200 billion in additional government debt.

Given this relationship between government debt and interest rates, concerns that higher interest rates would choke off the stimulative effects of recent tax reductions seem unwarranted. For example, this relationship implies that the $1.3 trillion in tax relief included in EGTRRA would raise interest rates by only about 19 basis points—a modest cost to be set against the long-term incentive-based benefits expected from lower marginal tax rates.

The modest effect of government debt on interest rates does not mean that tax cuts pay for themselves with higher output. Although the economy grows in response to tax reductions (because of higher consumption in the

Box 1-4. Calculating the Effect of Higher Government Debt on Interest Rates

The effect of government debt on interest rates depends on the productivity of capital in the economy, because additional government debt "crowds out" capital, increasing its scarcity relative to labor and thereby raising its return in the marketplace. The higher return to capital also increases the required return on other assets, such as bonds, which drives up interest rates. One can get some idea of the productivity of capital in the United States by measuring how much of total U.S. output is paid to suppliers of capital as opposed to suppliers of labor. Gross capital income is usually about one-third of total U.S. output, with the rest going to labor. Mathematically, the constancy of the capital share implies that the marginal return on each unit of capital is proportional to the output-to-capital ratio (Y/K). This proportionality implies that the percentage change in the marginal return to capital induced by a change in the capital stock is the same as the percentage change in Y/K, which is simply the percentage change in Y minus the percentage change in K. Some additional calculations show that the constant one-third capital share implies that output should fall by one-third of 1 percent for every 1 percent decline in capital. This allows us to write the ultimate percentage change in the marginal return to capital as (percent change in Y) – (percent change in K) = (–0.33 percent) – (–1.0 percent) = 0.67 percent. In other words, the marginal product of capital *rises* by 0.67 percent when the capital stock *falls* by 1.0 percent.

Box 1-4.—*continued*

Government data show that the U.S. capital stock was about $28 trillion in 2001, so that 1 percent of the capital stock is $280 billion. Because one dollar of debt reduces the capital stock by about 60 cents, an increase in government debt of about $467 billion is required to crowd out 1 percent of the capital stock ($467 billion x 0.60 = $280 billion). Government data also imply that the gross marginal product of capital is about 10 percent, which implies that a 1 percent decline in the capital stock would raise interest rates by about 6.7 basis points. A conservative rule of thumb based on this relationship is that interest rates rise by about 3 basis points for every additional $200 billion in government debt.

short run and improved incentives in the long run), it is unlikely to grow so much that lost tax revenue is completely recovered by the higher level of economic activity. The small effect of debt on interest rates does show, however, that attempts to stimulate the economy by *raising* taxes in order to *lower* interest rates are likely to be unsuccessful, especially if the taxes raised are those that discourage private saving and investment. The resulting reduction in interest rates will probably be too small to outweigh the negative effects of tax increases that work through distorted incentives. Further, the modest effect of increased debt on interest rates suggests that policymakers should not be afraid to use fiscal policy when doing so improves the long-run health of the economy. As long as the change in fiscal policy does not bring about large, systemic imbalances in the economy—such as a high debt-to-GDP ratio, or rapidly rising interest costs as a share of Federal outlays—policymakers should not be paralyzed by the fear that any benefits from tax reductions are likely to be undone by the increase in interest rates they bring about.

Developments in the Rest of the World

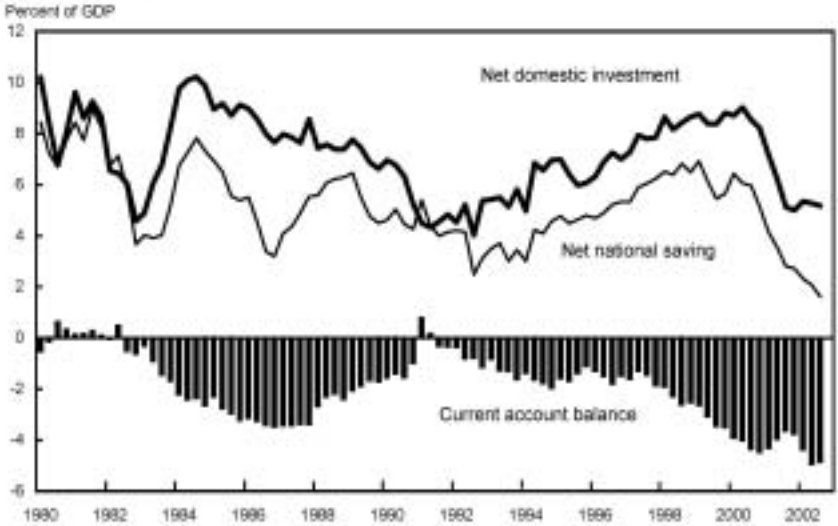
Growth in many of the United States' major trading partners was even more disappointing in 2002 than was growth at home. Although growth in Canada, America's largest trading partner, was a surprisingly robust 4.0 percent during the four quarters ending in the third quarter of 2002, growth elsewhere lagged far behind. The economy of the United Kingdom grew only 2.1 percent over the same period; growth rates in Germany (0.4 percent), Italy (0.5 percent), France (1.0 percent), Japan (1.3 percent), and Mexico (1.8 percent) were even lower. Low demand for U.S. exports combined with the emerging recovery in the United States (which increased U.S. demand for imports) sent the U.S. trade deficit to a record high in 2002.

Discussion of the U.S. position in international markets is often framed in terms of the current account, a broader measure of international transactions. In addition to the trade balance in goods and services, the current account includes net investment income, net compensation of resident alien workers, and net unilateral transfers. Because the trade component is by far the largest in the current account balance, the widening in the trade deficit in 2002 contributed strongly to the widening in the current account deficit. The latter reached a record 4.9 percent of GDP in the second quarter of 2002 before falling slightly, to 4.8 percent, in the third quarter.

One advantage of framing international finance discussions in terms of the current account is that, as a matter of national accounting, the current account balance equals the difference between net national saving and net national investment. For example, if U.S. saving were smaller than U.S. investment in a given period, the difference—the excess of investment over saving—must have been financed by foreigners. In the process of financing U.S. investment, foreign investors obtain U.S. assets, either in portfolio form (that is, as stocks, bonds, or other financial securities) or though direct controlling ownership of physical capital. These assets then generate investment income in the form of dividends, interest payments, and profits that can be repatriated to the investors abroad. Balance of payments data therefore resemble a "sources and uses of funds" statement for the Nation as a whole, providing useful information on the amounts of internal and external investment financing. High levels of investment in the late 1990s meant that the U.S. capital stock grew quickly in the late 1990s, but the accumulation of past current account deficits requires an increasing portion of the income earned by this capital to flow abroad. Over the past year, the U.S. current account deficit has widened because net investment has been essentially flat while net saving has fallen (Chart 1-10).

The relationship between the current account deficit and net investment by foreigners in U.S. assets also makes clear how changes in international

Chart 1-10 **Saving, Investment, and the Current Account Balance**
The current account deficit narrowed in 2001 as net domestic investment fell more quickly than saving, but it widened in 2002.



Note: The current account balance equals net national saving minus net domestic investment plus the statistical discrepancy.
Source: Department of Commerce (Bureau of Economic Analysis).

demand for U.S. assets can affect the trade balance, and vice versa. Consider an increase in foreigners' demand for U.S. assets. Their resulting accumulation of U.S. assets can affect international trade flows through an appreciation of the dollar, because foreigners must obtain dollars in order to purchase U.S. assets. Appreciation of the dollar tends to make imports cheaper for U.S. residents, and U.S. exports more expensive to consumers abroad; both these effects move the trade balance (and the current account) toward deficit.

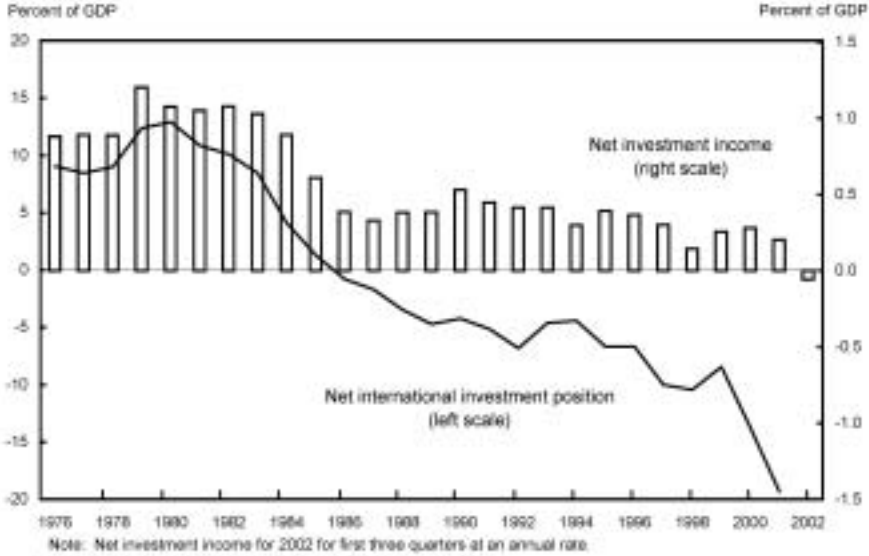
In light of the large number of trade-related and financial forces operating on the current account, it is impossible to label a current account deficit of a given magnitude either good or bad. As noted above, recent current account deficits result from U.S. investment outpacing domestic saving. One factor contributing to high U.S. investment relative to saving is the rapid increase in U.S. productivity relative to that in many other major countries, which makes the United States a good place to invest. Because productivity growth is ultimately responsible for rising living standards, the current account deficit reflects at least in part some very good news about the American economy.

Even so, a current account deficit indicates that the United States is consuming and investing more than it is producing. As Chart 1-10 shows,

the U.S. current account has typically been in deficit for the past two decades. As a result, the net international investment position in the United States (the value of U.S. investment holdings abroad less that of foreign holdings in the United States) has moved from an accumulated surplus of slightly less than 10 percent of GDP in the late 1970s to a deficit of almost 20 percent of GDP in 2001 (Chart 1-11). Recent increases in the current account deficit have led to some concerns that continued current account deficits (and the increase in the United States' international debt that would result) might not be sustainable. Clearly, debt cannot increase without limit. Because debt has to be serviced by the repatriation of capital income abroad, the ratio of a country's debt to its income has to stabilize at some point.

Yet the United States today is far from the point at which servicing its international debt becomes an onerous burden. In fact, until last year, more investment income was generated by U.S. investment in foreign countries than by foreign investments inside the United States, even though the net international investment position of the United States moved into deficit almost two decades ago (Chart 1-11). Given the United States' negative international investment position, the fact that, until 2002, more investment income flowed into the United States than flowed out of it implies that the

Chart 1-11 **International Investment Position and Investment Income**
Although the Nation's net international investment position became negative in the mid-1980s, net investment income remained positive until 2002.



Note: Net investment income for 2002 for first three quarters at an annual rate.
Source: Department of Commerce (Bureau of Economic Analysis).

rates of return on U.S. investment abroad were higher than the returns enjoyed by foreign investors in the United States. (Further analysis of international investment data indicates that these differences in rates of return are especially pronounced for direct investment, and less so for portfolio investment.) Although debt service became a net transfer from the United States to the rest of the world in 2002, this debt service is unlikely to amount to a significant portion of U.S. output in the foreseeable future.

Near-term developments in the U.S. current account depend on a number of factors. One of the most important is the rate of economic growth in the rest of the world. Faster growth abroad raises the demand for U.S. exports, which reduces the trade and current account deficits. A second factor affecting the U.S. current account is the propensity of U.S. residents to save. As Chart 1-2 showed, saving rates fell sharply in the 1990s; as noted above, this may have stemmed from the strong appreciation in the stock market, which allowed wealth to grow quickly without any increase in active saving out of disposable income. The retrenchment in asset prices that began in early 2000 may encourage some consumers to increase their active saving to pre-1995 levels. For any given level of domestic investment, an increase in the saving rate lessens the need to borrow from abroad and thereby reduces the current account deficit. In any event, it is far preferable to reduce the current account deficit by saving more than by reducing investment, because lower investment results in slower growth in the capital stock, a lower growth rate of labor productivity, and slower growth in living standards.

A third factor affecting the evolution of the current account is the future demand by foreign investors for U.S. assets. To the extent that foreign investors reduce their demand for U.S. assets and substitute holdings in other countries for those assets, the real exchange value of the dollar will fall, holding other factors constant. Conversely, the real value of the dollar will rise with an increase in the demand for U.S. assets. Such an increase in demand might result from continued productivity growth in the United States or from an increase in the perceived safety of U.S. assets relative to the rest of the world.

Moderate changes in foreign demand for dollar-denominated assets need not have large disruptive effects on the U.S. economy. Gradual shifts in the terms of trade would engender offsetting increases or decreases in the growth of consumption and imports, leaving real GDP little affected. In fact, if productivity growth remains relatively high in the United States while inflation remains low, a moderate shift in global demand away from U.S. assets and the subsequent decline in the real value of the dollar may not even require a change in the nominal exchange rate, because the real value of the dollar falls with a constant nominal exchange rate when inflation at home is lower than inflation abroad.

Moreover, history has shown that even a substantial decline in the value of the dollar need not result in sharply lower prices for U.S. stocks, bonds, or other assets. From the fourth quarter of 1985 to the fourth quarter of 1990, the real, trade-weighted exchange value of the dollar fell by nearly 24 percent while the current account deficit shrank from more than 3 percent of GDP to less than 1 percent. At the same time, however, stock prices rose by about 47 percent while long-term interest rates (which move inversely to bond prices) fell by more than 1 percentage point.

In the end, the key determinant of the sustainability of the U.S. international debt position is continued confidence in the economic policies of the United States. As long as the United States pursues its current market-oriented, pro-growth policies, there is no reason to believe that the current account deficit represents a problem for continued economic growth.

The Economic Outlook

The economy continues to display supply-side characteristics favorable to long-term growth. Productivity growth remains strong, and inflation remains low and stable. Real GDP is expected to grow faster than its 3.1 percent potential rate during the next 4 years, and then to grow at a 3.1 percent annual rate during the balance of the budget window. The Administration's projections are shown in Table 1-1.

TABLE 1-1.—*Administration Forecast*[1]

Year	Nominal GDP	Real GDP (chain-type)	GDP price index (chain-type)	Consumer price index (CPI-U)	Unemployment rate (percent)	Interest rate, 91-day Treasury bills (percent)	Interest rate, 10-year Treasury notes (percent)	Nonfarm payroll employment (millions)
	Percent change, fourth quarter to fourth quarter				Level, calendar year			
2001 (actual)	2.0	0.1	2.0	1.9	4.8	3.4	5.0	131.9
2002	4.2	2.9	1.2	2.3	5.8	1.6	4.6	130.8
2003	4.8	3.4	1.4	2.0	5.7	1.6	4.2	132.5
2004	5.2	3.6	1.5	2.1	5.5	3.3	5.0	135.2
2005	5.0	3.4	1.6	2.1	5.2	4.0	5.3	137.9
2006	5.0	3.3	1.7	2.2	5.1	4.2	5.4	140.4
2007	4.9	3.1	1.8	2.2	5.1	4.2	5.5	142.6
2008	5.0	3.1	1.8	2.3	5.1	4.3	5.6	144.7

[1] Based on data available as of November 29, 2002.

Sources: Council of Economic Advisers, Department of Commerce (Bureau of Economic Analysis), Department of Labor (Bureau of Labor Statistics), Department of the Treasury, and Office of Management and Budget.

Near-Term Outlook

The Administration expects that aggregate economic activity will have weathered a quarter of weakness at the end of 2002, following which it will gather strength during 2003, with real GDP growing 3.4 percent during the four quarters of the year. The unemployment rate, which was 5.9 percent in the fourth quarter of 2002, is projected to edge down about 0.3 percentage point by the fourth quarter of 2003.

As discussed earlier, real GDP growth in 2002 was accounted for by solid growth in consumption, a modest pickup in exports, and an increase in inventory investment. Although investment in equipment and software was slow, it stabilized during the first quarter of 2002 and began to grow in the second and third quarters, foreshadowing one way in which the composition of growth is projected to differ next year: the growth rate of equipment and software investment is projected to pick up in 2003. (Another difference is that the contribution of inventory investment is projected to wane.) Several factors are expected to lead to a rebound in equipment and software investment. Any capital overhang that might have arisen during the late-1990s investment boom has been reduced, because the level of investment fell in 2001; expectations of future GDP growth have stabilized after falling during 2001; and the replacement cycle is approaching for the short-lived capital goods put in place during the investment boom of 1999 and 2000. At the same time, the financial foundations for investment remain positive: real short-term interest rates are low, and prices of computers are falling more rapidly than they did in 2000. (Computer investment accounted for a third of all nonresidential investment growth from 1995 to 2000.) Less bright is the outlook for nonresidential structures, which still appears weak even after 2 years of decline. Even so, structures investment is projected to stabilize around the second half of 2003, as the maturing recovery generates higher occupancy rates for office buildings and greater demand for commercial properties. The recent passage of legislation for terrorism risk insurance may unblock some planned investments in structures that were held up because of lack of insurance.

Real exports, which turned up in 2002, are projected to improve further during 2003, reflecting the widely held expectation of stronger growth among the United States' trading partners and the lagged effects of the past year's decline in the dollar. Although real imports and exports are expected to grow at similar rates during the four quarters of 2003, the United States imports more than it exports, and therefore the dollar value of imports is expected to increase more than the dollar value of exports. As a result, net exports are likely to become more negative during the course of 2003.

Less change is expected for the largest component of aggregate demand, consumption, which is expected to remain robust in 2003. The negative influence of the stock market decline on household wealth, and thus on

consumption, is expected to wane as this decline recedes into history. Consumption growth will also be supported by fiscal stimulus and the lagged effects of recent interest rate cuts. Finally, low interest rates will continue to support the purchase of consumer durables, just as they did for much of 2002.

Inflation Forecast

As measured by the GDP price index, inflation fell to 0.8 percent during the four quarters ending in the third quarter of 2002—down from 2.6 percent during the same period a year earlier. This broad-based index of prices of goods and services produced in the United States is expected to rise somewhat faster, at 1.4 percent during 2003, as the restraining effects of falling energy prices and low food price inflation subside and the economy strengthens. Inflation is expected to remain low, however, as the unemployment rate is now above the level that the Administration considers to be the center of the range consistent with stable inflation, and capacity utilization in the industrial sector is substantially below its historical average. Inflation by the GDP measure is projected to edge up to 1.8 percent by 2007 and to stay there for the remainder of the budget window.

As measured by the CPI, inflation during the 12 months ended in December 2002 was 2.4 percent; core inflation was 1.9 percent. The CPI, which differs from the GDP price index both in its methodology and in that it includes only consumer goods and services, is projected to rise 2.0 percent in 2003, close to last year's core rate.

The difference between the CPI and the GDP measure of inflation has an important effect on Federal budget projections. A larger difference increases the Federal budget deficit because cost-of-living adjustments for Social Security and other programs that are indexed for inflation increase with the CPI, whereas Federal revenue tends to increase with the slower growing GDP price index. For a given level of nominal income, increases in the CPI also cut Federal revenue because they raise the thresholds of income tax brackets and affect other inflation-indexed features of the tax code. Of the two indexes, the CPI tends to increase faster, in part because it measures the price of a fixed market basket. (See Box 1-3 above on the new chain-weighted CPI.) In contrast, the GDP price index increases less rapidly than the CPI because it reflects the choices of economic agents to shift their purchases away from those items with increasing relative prices and toward items with decreasing relative prices. In addition, the GDP price index includes investment goods, such as computers, whose relative prices have been falling rapidly. Computers, in particular, receive a much larger weight in the GDP price index (0.7 percent) than in the CPI (0.2 percent).

During the 7 years from 1994 through 2001, the difference between inflation in the CPI-U-RS (a version of the CPI designed to be consistent

with current methods) and the rate of change in the GDP price index averaged 0.5 percentage point a year, and it was 0.8 percentage point during the four quarters ending in the third quarter of 2002. The difference is expected to shrink to 0.6 percentage point in 2003-04 and to revert to its recent mean of 0.5 percentage point in 2005 and beyond.

Long-Term Outlook

The Administration forecasts real annual GDP growth to average 3.4 percent during the first 4 years of the projection. As this is somewhat above the expected rate of increase in productive capacity, the unemployment rate is projected to decline as a consequence. In 2007 and 2008, real GDP growth is projected to continue at its long-run potential rate of 3.1 percent. The growth rate of the economy over the long run is determined by the growth rates of its supply-side components, which include population, labor force participation, productivity, and the workweek. The Administration's forecast is shown in Table 1-2.

TABLE 1-2.—*Accounting for Growth in Real GDP, 1960-2008*

[Average annual percent change]

Item	1960 Q2 to 1973 Q4	1973 Q4 to 1990 Q3	1990 Q3 to 2002 Q3	2002 Q3 to 2008 Q4
1) Civilian noninstitutional population aged 16 or over	1.8	1.5	1.0	1.1
2) Plus: Civilian labor force participation rate	.2	.5	.0	.0
3) Equals: Civilian labor force [1]	2.0	2.0	1.0	1.0
4) Plus: Civilian employment rate [1]	.0	-.1	.0	.1
5) Equals: Civilian employment [1]	2.0	1.9	1.0	1.1
6) Plus: Nonfarm business employment as a share of civilian employment [1 2]	.1	.1	.2	.4
7) Equals: Nonfarm business employment	2.1	2.0	1.2	1.6
8) Plus: Average weekly hours (nonfarm business)	-.5	-.4	-.1	.0
9) Equals: Hours of all persons (nonfarm business)	1.7	1.7	1.1	1.6
10) Plus: Output per hour (productivity, nonfarm business)	2.9	1.4	2.2	2.1
11) Equals: Nonfarm business output	4.6	3.1	3.3	3.8
12) Plus: Ratio of real GDP to nonfarm business output [3]	-.3	-.2	-.4	-.5
13) Equals: Real GDP	4.2	2.9	2.9	3.2

[1] Adjusted for 1994 revision of the Current Population Survey.
[2] Line 6 translates the civilian employment growth rate into the nonfarm business employment growth rate.
[3] Line 12 translates nonfarm business output back into output for all sectors (GDP), which includes the output of farms and general government.

Note.—The periods 1960 Q2, 1973 Q4, and 1990 Q3 are business cycle peaks.
Detail may not add to totals because of rounding.

Sources: Council of Economic Advisers, Department of Commerce (Bureau of Economic Analysis), and Department of Labor (Bureau of Labor Statistics).

The Administration expects nonfarm labor productivity to grow at a 2.1 percent annual average pace over the forecast period, virtually the same as that recorded from the business cycle peak in 1990 through the third quarter of 2002. This projection is notably more conservative than the nearly 2¾ percent average rate actually recorded since 1995. The cautious projection of productivity growth guards against several downside risks:

- Nonresidential fixed investment has fallen about 12 percent since its peak in mid-2000. The slower pace of investment means that the near-term growth of capital services is likely to be reduced from its average pace from 1995 to 2002, leading to a lesser contribution to productivity growth from the use of these capital services.
- As discussed in Box 1-5, about half of the post-1995 structural productivity acceleration is attributable to growth in total factor productivity (TFP) outside of the computer sector. This growth is due to technological progress, better business organization, and other factors that are hard to identify. Although there is no reason to expect this process to slow, the Administration forecast adopts a cautious view of the pace of TFP growth, setting it near its longer term average rather than at the higher post-1995 pace.

Box 1-5. Accounting for the Recent Strength in Productivity Growth

The most important macroeconomic characteristic of the late-1990s boom, rapid productivity growth, remains intact. Annual productivity growth has averaged almost 3 percent during the past 2 years, a period that includes a recession (when productivity usually slows) and the early stages of a recovery (when productivity usually rises rapidly). This growth, moreover, has occurred despite a roughly 12 percent decline in nonresidential investment spending since 2000.

Table 1-3 presents the results of an analysis of some of the factors that influence productivity growth and compares their influence in two periods: 1973-95 and 1995-2002. According to a model constructed by the Council of Economic Advisers that is designed to capture the cyclical behavior of productivity growth, the productivity acceleration after 1995 would have been 0.30 percentage point a year stronger but for the delayed hiring needed to accommodate increases in aggregate demand that occurred before and during 1995 (second line of Table 1-3). Productivity adjusted for this cyclical effect, or structural productivity, has accelerated by 1.73 percentage points since 1995 (third line of Table 1-3). Cyclical factors held down productivity growth by 1.8 percentage points in 2001, as the economy entered a shallow recession, and then boosted

Box 1-5.—*continued*

productivity growth by about 1.5 percentage points in the early stages of a recovery in 2002. (These figures average to -0.15 percentage point, as shown in the table.) Thus during 2001 and 2002 structural productivity is estimated to have grown 2.8 percent and 3.6 percent, respectively. This estimated pace is similar to that for the 1995-2002 period as a whole and well in excess of the 1.4 percent annual pace during the 1973-95 period.

In the accounting system adopted here, productivity increases can arise from any of four sources: growth in the amount of capital services per worker-hour throughout the economy (capital deepening), improvements in the skills of the work force (labor quality), total factor productivity (TFP) growth in computer-producing industries, and TFP in other industries. TFP growth is the increase in aggregate output over and above that due to increases in capital or labor inputs. For example, TFP growth may result from a firm redesigning its production process in a way that increases output while keeping the same number of machines, materials, and workers as before.

As can be seen in the fourth line of the table, capital services per hour contributed 0.52 percentage point more to productivity growth after 1995 than before, with information technology accounting for most of this acceleration. But in the wake of the drop in investment during the past 2 years, one might think that this growing contribution of capital deepening could not be sustained. Growth in capital services, which had averaged 5.5 percent annually from 1995 to 2000, dropped to about 3 1/2 percent during the past 2 years. The drop in information capital services growth has been more pronounced: from a 16 percent annual pace before 2001 to 8 3/4 percent annually in 2001 and 2002. This slowdown has been completely offset, however, by the decline in hours in 2001 and 2002, with the result that capital services per hour has grown even faster than in the late 1990s.

The Bureau of Labor Statistics measures labor quality in terms of the education and experience of the work force. The agency uses differences in earnings paid to workers with different characteristics to infer relative differences in productivity. Measured in this way, labor quality has risen as the education and skills of the work force have increased. However, the increase occurred at about the same rate both before and after 1995, so that labor quality does not account for any of the post-1995 acceleration of productivity.

The rate of growth of TFP in computer-producing industries has been rising, as evidenced by the rapid decline in computer prices relative to prices in the rest of the business sector. Relative computer prices fell at a 26 percent annual rate during 1995-2000. Although this rate of decline has slowed a bit in the past 2 years—to 21 percent—it remains impressive. Calculations using relative computer prices as an indirect measure of productivity growth in the computer-producing industries indicate that the

annual contribution of computer manufacturing to productivity growth in the private nonfarm business sector accelerated 0.13 percentage point, to 0.31 percent, during 1995-2002 on average. However, that contribution has edged back down during the past 2 years to 0.21 percentage point a year.

The final contribution comes from accelerating TFP in the economy outside the computer-producing industries. This contribution is calculated as a residual; it captures the extent to which technological change and other business and workplace improvements outside the computer-producing industries have boosted productivity growth since 1995. This factor accounts for about 1.08 percentage points of the post-1995 acceleration in structural productivity, or about 60 percent of the total. Taken at face value, it implies that improvements in the ways capital and labor are used throughout the economy are central to the post-1995 acceleration in productivity, but because it is calculated indirectly, as a residual, it is equally an illustration of the limits on our ability to account for the acceleration.

In summary, structural productivity growth remained almost as strong in 2001 and 2002 as in the years immediately preceding. Growth in TFP likewise continued strong, with industries outside the computer sector making substantial contributions.

TABLE 1-3.—*Accounting for the Productivity Acceleration Since 1995*

[Private nonfarm business sector; average annual rates]

	Item	1973 to 1995	1995 to 2002	Acceleration (percentage points)	2000 to 2002
	Labor productivity growth rate (percent)	1.39	2.81	1.42	3.05
	Percentage point contributions:				
Less:	Business cycle effect	.02	-.28	-.30	-.15
Equals:	Structural labor productivity	1.37	3.10	1.73	3.21
Less:	Capital services per hour	.73	1.25	.52	1.64
	Information capital services	.41	.82	.40	.69
	Other capital services	.32	.43	.11	.94
	Labor quality	.27	.26	-.02	.26
Equals:	Structural TFP	.36	1.57	1.21	1.29
Less:	Computer sector TFP	.18	.31	.13	.21
Equals:	Structural TFP excluding computer sector TFP	.18	1.25	1.08	1.07

Note.—Labor productivity is the average of income- and product-side measures of output per hour worked. Total factor productivity (TFP) is labor productivity less the contributions of capital services per hour (capital deepening) and labor quality.

Data are adjusted for the July 2002 annual revision to the national income and product accounts (NIPA).

Productivity for 2002 is inferred from data for the first three quarters.

Detail may not add to totals because of rounding.

Sources: Department of Commerce (Bureau of Economic Analysis) for output and computer prices; Department of Labor (Bureau of Labor Statistics-BLS) for hours, and for capital services and labor quality through 2000, but the BLS figures have been adjusted by the Council of Economic Advisers for the effects of the July 2002 NIPA revision; and Council of Economic Advisers for the business cycle effect, and for capital services and labor quality for 2001-2002.

In addition to productivity, growth of the labor force (also shown in Table 1-2) is projected to contribute 1.0 percentage point a year to growth of potential output on average through 2008. Labor force growth results from growth in the working-age population and changes in the labor force participation rate. The Bureau of the Census projects that the working-age population will grow at an average annual rate of 1.1 percent through 2008. The labor force participation rate is expected to be roughly flat through 2008, although it may begin to decline around that year, which is the year that the oldest baby-boomers (those born in 1946) reach the early-retirement age of 62.

In sum, potential real GDP is projected to grow at about a 3.1 percent annual pace, slightly above the average pace since 1973. Actual real GDP growth during the 6-year forecast period is projected to be slightly higher, at 3.2 percent, because the civilian employment rate (line 4 of Table 1-2) makes a small (0.1 percentage point) and transitory contribution to growth through 2006. This contribution then ends as the unemployment rate stabilizes at 5.1 percent.

Interest Rate Outlook

Following a large decline in 2001, the interest rate on 91-day Treasury bills fell an additional 50 basis points in 2002 and ended the year at 1.2 percent. These reductions reflected the Federal Reserve's efforts to stimulate the economy, which left real short-term rates (that is, nominal rates less expected inflation) close to zero. Real rates are not expected to remain this low once the recovery becomes firmly established, and nominal rates are projected to increase gradually to 4.3 percent by 2007, which would leave the real interest rate on Treasury bills close to its historical average.

The Administration projects that the yield on 10-year Treasury notes, which was 4.2 percent when the projection was finalized at the end of November, will stay at that level for 2003 and then rise very slowly, reaching 5.6 percent by 2008. At that time their yield will be 3.3 percentage points above expected CPI inflation—a relationship that is consistent with the historical average since 1959. From 2005 onward the projected term premium (the premium of the 10-year rate over the 91-day rate) of 1.3 percentage points is in line with its historical average.

Income Forecast

One important purpose of the Administration's forecast is to estimate future government revenue, which requires a forecast of the components of taxable income. The Administration's income-side projection is based on the historical stability of the long-run labor and capital shares of gross domestic income (GDI). During the first three quarters of 2002, the labor share of GDI was on the low side of its historical average of 58.0 percent. From this

starting point, it is projected to rise to its long-run average and then remain at this level over the forecast period. The labor share consists of wages and salaries, which are taxable, other labor income (that is, fringe benefits), which is not taxable, and employers' contributions for social insurance. The Administration forecasts that the wage and salary share will decline while other labor income grows faster than wages. This pattern has generally been in evidence since 1960 except for a few years in the late 1990s.

The capital share (the complement of the labor share) of GDI is expected to fall slightly before leveling off at its historical average. Within the capital share, a near-term decline in depreciation (a consequence of the decline in short-lived investment during the past 2 years) is offset by a rise in economic profits, which averaged 7.5 percent of GDI during the first three quarters of 2002, a bit below the post-1973 average of 8.0 percent. Economic profits are expected to rise to roughly 8 percent of GDI and to remain flat at that level for the duration of the projection period. The pattern of book profits (known in the national income and product accounts as "profits before tax") reflects the 30 percent expensing provisions of the Job Creation and Worker Assistance Act. These expensing provisions reduce taxable profits from the third quarter of 2001 through the third quarter of 2004. The expiration of the expensing provisions increases book profits thereafter, however, because the fraction of investment goods expensed during the 3-year window will not be eligible for depreciation thereafter. Other taxable income (the sum of rent, dividends, proprietors' income, and personal interest income) is projected to fall, mainly because of the delayed effects of past declines in long-term interest rates, which reduce personal interest income during the projection period.

Conclusion

The Administration believes that the economy is likely to grow somewhat faster than in the projection presented here, as the long-run benefits from the full reductions in marginal tax rates and the dividend exclusion are felt. These should lead to increases in labor force participation and increased entrepreneurial activity. The Administration, however, chooses to adopt conservative economic assumptions that are close to the consensus of professional forecasters. As such, the assumptions provide a prudent, cautious basis for the budget projections. Yet the Administration's policies are designed to enhance U.S. economic growth, not just maintain it. The remaining chapters of this *Report* illustrate ways in which pro-growth economic policies can improve economic performance at home and abroad, by striking the right balance between the encouragement and regulation of firms, by promoting flexibility and dynamism in labor markets, and by reducing tax-based disincentives to economic activity.