CHAPTER 2

Macroeconomic Policy and Performance

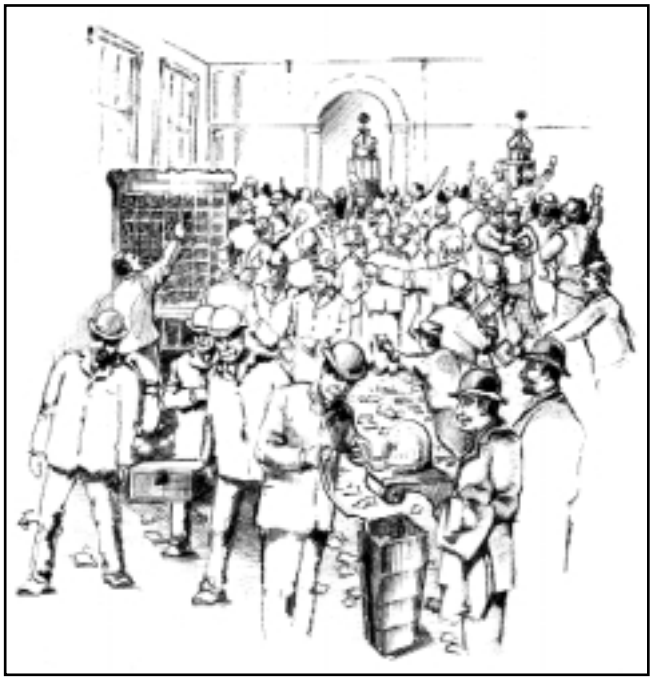


Illustration by Paul Sutton

The evolution of the stock market illustrates how dramatically technology has changed the way we do things and the things we are able to do. At the start of the 20th century, the purchase of stock was a lengthy and labor-intensive process. After a trade, messengers would hand-deliver the stock certificates, which were then carried to a vault for safekeeping. Today, computers and instant global communications have made the trading of stocks anywhere in the world just a mouse click away.

THE U.S. ECONOMY PERFORMED very well in 1999. The economic expansion is on the verge of shattering the all-time endurance record, set during the 1960s, of 106 months. Real (inflation-adjusted) output increased a robust 4.2 percent over the four quarters of 1999, on a par with the energetic pace set over the preceding 6 years of this Administration. An additional 2.7 million nonagricultural jobs were created during the year, bringing the total created during this expansion to nearly 22 million (20.6 million during the 7 years of this Administration). The unemployment rate dropped to 4.2 percent for the year as a whole, its lowest level in 30 years (Chart 2-1). The consumer price index rose by 2.7 percent over the 12

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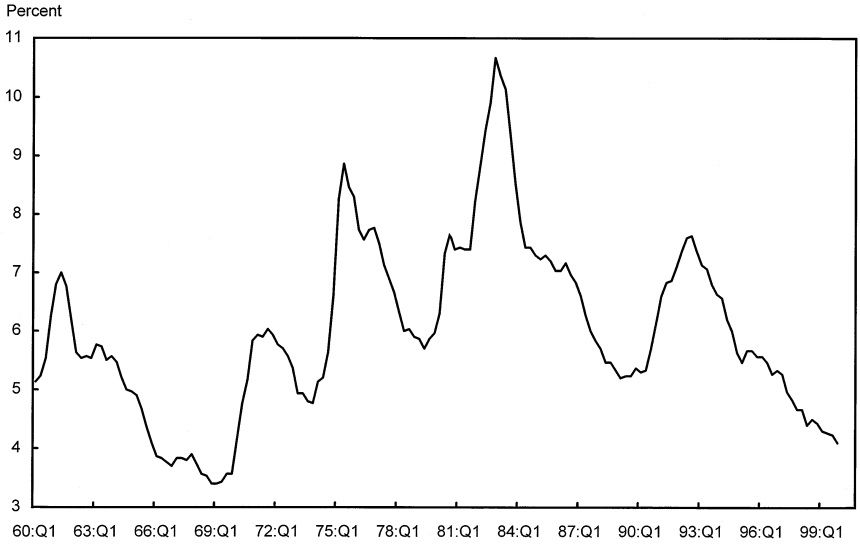
months of 1999, a pickup from the previous year's 1.6 percent rate (Chart 2-2). A sharp rise in energy prices, following 2 years of declines, accounted for more than the entire acceleration in consumer prices in 1999. Consumer prices excluding energy and food prices were up only 1.9 percent over all of 1999, the smallest December-to-December percentage increase since 1965. Over the first three quarters of 1999, productivity (output per hour) in the nonfarm business sector increased at an annual rate of 2.8 percent, marking the fourth straight year of strong productivity growth.

These statistics portray a vibrant economy ending the 20th century on a strong note, with robust growth, high employment, and low and stable inflation. A key factor in the recent remarkable performance of the economy has been an acceleration in productivity. In the long run, productivity growth sets the pace for improvements in the quality of life. Rising productivity over most of the last 100 years has dramatically changed the face of the American economy in terms of living standards, the affordability of life's basic goods, and the range of goods and services Americans can buy.

As American workers became more productive, average nominal wages rose from 15 cents an hour at the turn of the century to about $14 by 1999. Of course, in general prices have also risen over that time. But the gains in wages have far outpaced the rise in prices for the goods and services we buy. For instance, a candy bar that cost a nickel in 1900 might cost about 50 cents today, but today it takes the average worker just 2 minutes to earn that 50 cents, whereas in 1900 it took nearly 20 minutes of work to earn a nickel. Other goods are not only cheaper but of better quality as well. For example, in 1916 a refrigerator with 9 cubic feet of storage cost $800, the equivalent of over 3,000 hours of wages for the average worker. Today a refrigerator with more than twice the capacity, and with features not available 80 years ago such as an icemaker or an automatic defroster, costs about $900, or about 65 hours of work at the average wage. But the computer industry offers the most dramatic example of our increased buying power. In 1970 a state-of-the-art computer cost about $4.7 million, an amount equal to 15 times the lifetime wages of the average worker. In 1999 a personal computer with more than 10 times as much computing power cost only $1,000, or less than 2 weeks of the average worker's pay, and this figure is likely to fall to just 1 day's pay in the next decade or so.

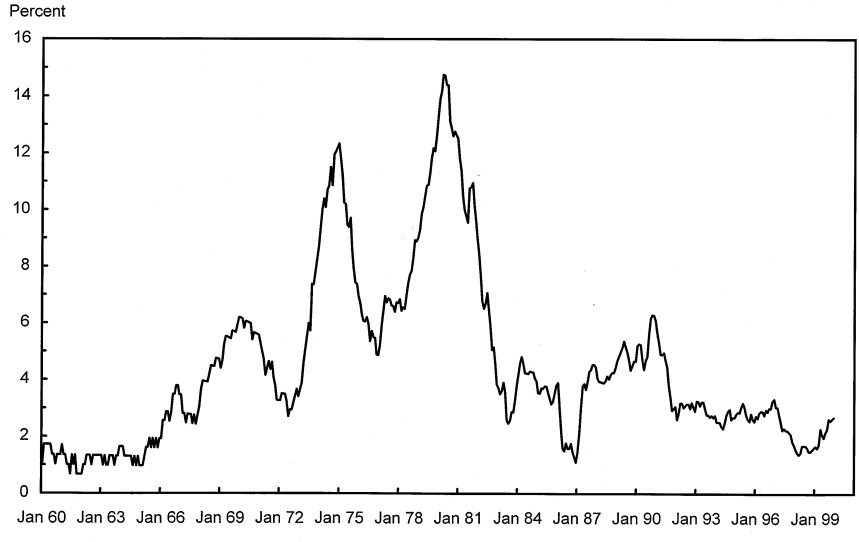
This record of long-term productivity growth and the resulting dramatic changes in the quality of life are the result of investments, both public and private, in education, science and technology, business capital, and infrastructure. These and other causes and consequences of economic growth in the past, and the outlook for continued growth in the future, are a recurring theme of this chapter. Of course, the transformation and expansion of the U.S. economy have not always been smooth: periods of growth were often

Chart 2-1 **Unemployment Rate**
In 1999 the unemployment rate fell to its lowest level in nearly 30 years.



Source: Department of Labor (Bureau of Labor Statistics).

Chart 2-2 **Inflation Rate**
Consumer price inflation remained low in 1999.



Note: Data are 12-month percent changes in the CPI.
Source: Department of Labor (Bureau of Labor Statistics).

interrupted by recession, and in the 1930s by the Great Depression. Thus a second theme of this chapter is how changes in the economy and in government policy have contributed to the macroeconomic performance we now enjoy: solid growth, high employment, and stable low inflation.

As discussed in the other chapters of this Report, public policy has provided a strong foundation for the robust health of today's economy. One key to the outstanding macroeconomic performance of the last 7 years has been the reemergence of fiscal discipline, starting with the Omnibus Budget Reconciliation Act of 1993 (OBRA 93), continuing with the Balanced Budget Act of 1997, and including the President's veto of proposed massive tax cuts in 1999. The Federal Government is once again a net saver. That is, the Federal Government is now a source of funds for private investments in education, housing, and business; this is in contrast to the preceding 28 years, when it was a net borrower, competing with households and businesses seeking funds for investment. In fiscal 1999 alone this return to fiscal discipline freed over $120 billion that can be used for private investment—investment that provides jobs and will improve future productivity and real wages. This contrasts sharply with the record $290 billion deficit of fiscal 1992. Although the strong economy accounts for some of the improvement, the Congressional Budget Office's standardized-employment budget (which attempts to control for cyclical and special factors) shows the same pattern of a large deficit in fiscal 1992 and a surplus in 1999. Monetary policy likewise has contributed to supporting long-term growth: by keeping inflation low and stable, it has reduced the distortions to investment decisions associated with high and variable inflation.

With the economy running strong, it is vital that fiscal policy continue to be disciplined and directed at paying down the national debt. By adding to national saving, Federal surpluses lower interest rates, lowering the cost of consumer debt and home mortgages to households as well as the cost of investment in technology and capital to businesses. Such investments boost productivity and raise living standards. Federal spending needs to be targeted at top national priorities such as encouraging saving and investments in people and technology, health care, families, and the environment. Likewise, tax cuts should be moderate and targeted to areas where they can do the most good. Looking ahead, paying down the debt now is the best way to prepare for the looming retirement of the baby-boom generation and the consequent demands on Social Security and Medicare, as well as for other needs we cannot today anticipate.

The first section of this chapter reviews the course of the U.S. economy during 1999. The second examines patterns of national saving and investment in recent decades and how government deficits and surpluses have affected national saving. The third section examines how the nature of the

business cycle has changed over the past century. The fourth and final section takes up the near-term outlook and the Administration's long-run forecast, paying particular attention to the effects of changes in productivity trends on growth and inflation.

The Year in Review

Real gross domestic product (GDP) increased 4.2 percent between the fourth quarter of 1998 and the fourth quarter of 1999 (Table 2-1). Even in the ninth year of the expansion, real output growth remained strikingly robust. The breakdown of the contributions to growth by major category in 1999 was similar to that over the whole expansion to date. Household spending and business investment in equipment once again provided the main contributions to growth. Government spending provided somewhat more impetus to growth than in previous years of the expansion, owing to increased spending by the Federal Government and by State and local governments. The drag exerted by the fact that imports grew faster than exports weighed in heavier than in the previous year.

TABLE 2-1.—*Growth of Real GDP and its Components During 1998 and 1999*

Item	Growth rate (percent)		Contribution to GDP growth (percentage points)	
	1998	1999[1]	1998	1999[1]
Gross domestic product	4.6	4.2	4.6	4.2
Final sales	4.7	4.3	4.6	4.3
Consumer expenditures	5.1	5.4	3.4	3.6
Housing	11.3	3.2	.5	.1
Business fixed investment	13.1	7.0	1.5	.9
Exports of goods and services	1.9	4.0	.2	.4
Imports of goods and services	10.8	13.1	-1.3	-1.7
Government consumption and gross investment	2.2	4.8	.4	.8
Change in inventories	—	—	-.0	-.0

[1] Preliminary.

Note.—Data are for fourth quarter to fourth quarter.
Contributions are approximate.
Detail may not add to totals because of rounding.

Source: Department of Commerce (Bureau of Economic Analysis).

Components of Spending

Real GDP growth was strong in each quarter except the second, when it dipped to a 1.9 percent annual rate. The quarter-to-quarter movements in

GDP were exaggerated by swings in inventory investment (discussed further below), which slumped in the second quarter before rebounding in the third quarter and then surging in the fourth. In contrast, growth in real final sales, which excludes inventory accumulation, fell only modestly in the second quarter. Real final sales increased 4.3 percent over the four quarters of 1999.

Household Spending

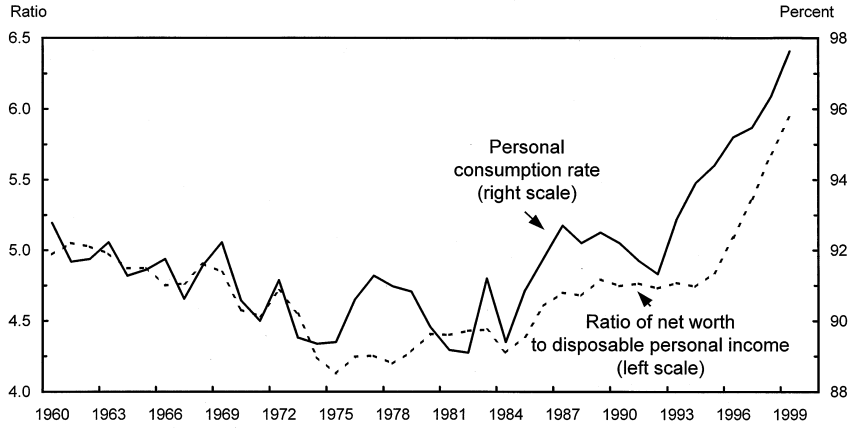
Real personal consumption expenditures (PCE) raced ahead at a 5.4 percent annual rate over the four quarters of 1999, besting the 5.1 percent pace set in 1998. Consumption growth contributed 3.6 percentage points to overall growth over the year as a whole. Real purchases of new motor vehicles increased about 5 percent over the four quarters of 1999; this was off the 14 percent pace of 1998. Total sales of automobiles and light trucks reached a record 16.8 million vehicles in 1999. Demand for housing also continued strong in 1999. Single-family housing starts topped 1998's record figure, as did sales of new and existing single-family homes. The share of American households who own their own homes was 67 percent in 1999. This figure surpassed the record high annual level set in 1998. Growth in several housing indicators stalled in the second half of the year, however, as the effects of higher mortgage rates began to take hold. Still, housing markets remained strong, and measures of construction activity were at historically high levels.

Favorable economic performance continued to drive this robust growth in household spending, and consumer confidence continued to run strong, according to household surveys. Real disposable personal income (deflated by the PCE chain-weighted price index) recorded impressive growth of about 3.7 percent at an annual rate over the four quarters of 1999. The strong stock market and a pickup in the value of homes further boosted household wealth, on top of sizable gains in each of the preceding 4 years. As a result, household net worth nearly reached the level of six times annual personal income (Chart 2-3). With wealth continuing to grow faster than income, households have been willing to spend a larger share of their disposable income (which, in the measurement concept used in the national income and product accounts, does not include capital gains). Hence the personal consumption rate rose for the seventh straight year, and the personal saving rate correspondingly fell.

Business Investment

Real business fixed investment continued to boom last year. Real business investment in equipment and software increased 11 percent at an annual rate during 1999. Spending on information processing equipment and software was the main contributor to the expansion in business investment. Adjusted for quality improvements, prices for many of these goods declined sharply in 1999. Real outlays on computers and peripheral equipment were up 39 per-

Chart 2-3 **Net Worth and the Personal Consumption Rate**
Personal consumption as a share of disposable income rose for the seventh straight year as the continued surge in household wealth encouraged spending.



Note: Personal consumption rate is the ratio of personal outlays to disposable personal income. Household net worth for each year is constructed as the average of net worth at the beginning and the end of the year; data for 1999 are approximate.
Sources: Department of Commerce (Bureau of Economic Analysis) and Board of Governors of the Federal Reserve System.

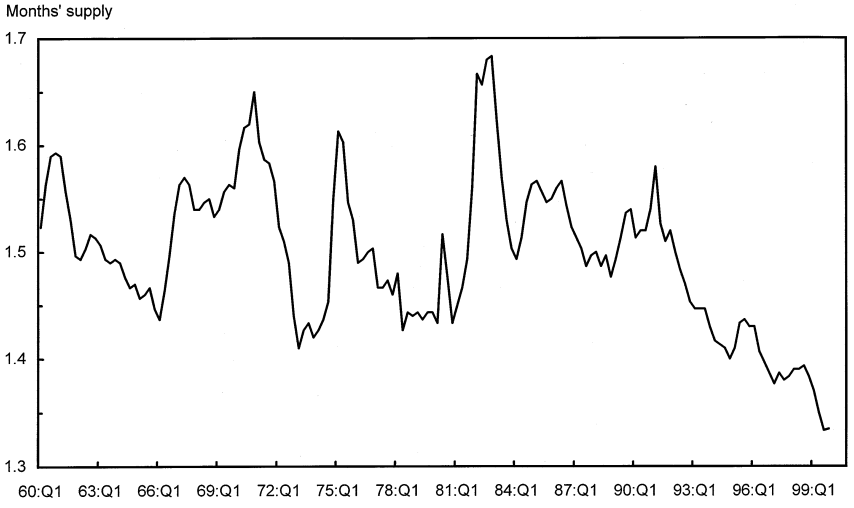
cent over the four quarters of 1999, while real business spending on software increased about 13 percent, and real spending on other information processing equipment (which includes communications equipment) increased 18 percent. As in the previous year, the brisk pace of computer-related investment resulted in part from the updating and replacement of older systems in preparation for the century date change (better known as the year-2000 or Y2K problem). Investment in transportation equipment also showed solid gains; however, other categories of equipment investment were nearly flat.

Real spending on nonresidential structures declined about 5 percent over the four quarters of 1999, as growth in earlier years (4.8 percent in 1997 and 2.9 percent in 1998) appears to have satisfied demand for new space for a while.

Business inventories increased modestly through the first half of 1999. The pace of inventory accumulation strengthened in the third quarter. However, brisk sales brought inventory stocks down to lean levels relative to sales through the first three quarters of 1999 (Chart 2-4). Toward the end of the year, businesses apparently built up inventory stocks in anticipation of potential Y2K disruptions, but sales continued to keep pace.

For the decade of the 1990s as a whole, the overall inventory-to-sales ratio showed a downward trend. This ratio for the manufacturing sector was falling for most of the decade, and more recently the retail inventory-to-sales ratio also has fallen. This downward trend in inventories is likely related to the adoption of just-in-time inventory management as well as to the use of new

Chart 2-4 **Inventory-to-Sales Ratio (Manufacturing and Trade)**
The inventory-to-sales ratio declined throughout most of 1999, reaching its lowest level in nearly 50 years.



Note: Based on data in current dollars. Data for 1999:Q4 based on October and November monthly data.
Source: Department of Commerce (Bureau of the Census).

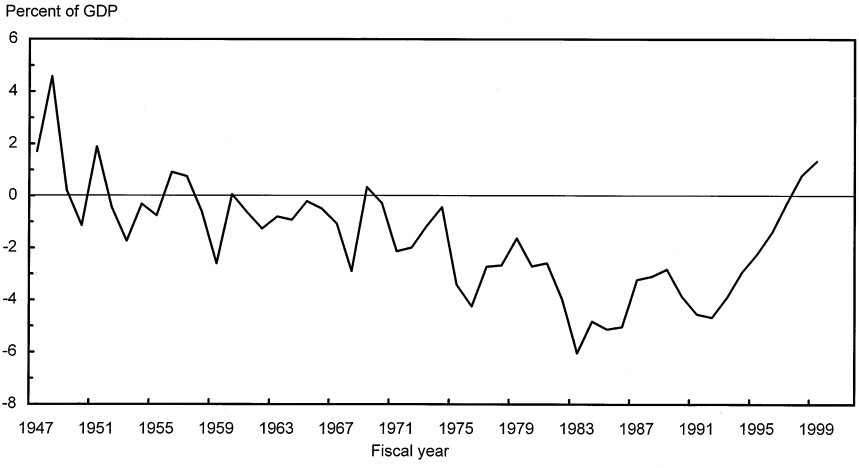
information technologies that enable businesses to manage with leaner inventories (as discussed in Chapter 3).

Government

Real Federal Government consumption expenditures and gross investment increased 5.3 percent on a national income and product accounts (NIPA) basis over the four quarters of 1999. Real defense spending rose 5.4 percent during that period, reversing a downward trend that saw this spending category fall nearly 2.6 percent per year on average over the preceding decade. Real nondefense spending was up 5.0 percent over 1999 as a whole. Federal purchases of equipment and software were an important contributor to the pickup in real Federal purchases.

The Federal Government surplus on a unified budget basis for fiscal 1999 (which ended in September) was $124 billion, compared with $69 billion in fiscal 1998. The last time the Federal Government recorded two consecutive budget surpluses was over 40 years ago. And at 1.4 percent of GDP, the fiscal 1999 surplus was the largest relative to the size of the economy in nearly 50 years (Chart 2-5). The challenge for the future is to maintain the hard-earned fiscal discipline of recent years, so that the economy continues to reap the rewards of greater investment and growth. In support of this goal, the President rejected a congressional proposal for large-scale tax cuts that threatened the prospects for continued fiscal discipline; instead he has proposed a budget

Chart 2-5 **Federal Budget Surplus**
The Federal Government surplus reached 1.4 percent of GDP in fiscal 1999, its highest level by this measure since 1951.



Note: In October 1999, the Bureau of Economic Analysis (BEA) revised official GDP data beginning in 1959. Post-1959 GDP figures are the official BEA data; earlier GDP figures have been adjusted for consistency with the revised data.
Sources: Department of the Treasury, Office of Management and Budget, and Council of Economic Advisers.

framework that continues to pay down the national debt while providing for critical needs and moderate tax cuts.

State and local governments increased real spending on consumption and gross investment by 4.5 percent over the four quarters of the year. This pace of spending represents a pickup from the average 3.2 percent annual increase recorded over the previous 3 years. The strong economy has boosted State tax revenues, so that most State governments today appear to be in excellent financial condition. At the end of fiscal 1999, over two-thirds of the States surveyed had surpluses equal to 5 percent or more of general fund expenditures (Wall Street's benchmark for financial solidity), and one in three had balances equaling 10 percent of expenditures.

International Influences

International developments in 1999 posed a challenge to the continued strong performance of the U.S. economy. Foreign growth rebounded in 1999, but its past weakness kept demand for U.S. exports subdued during the first half of the year. Export growth picked up in the second half of the year. Real purchases of U.S. exports increased 4.0 percent over the four quarters of 1999. Meanwhile, strong income growth in the United States and low relative prices for imported goods fueled increased U.S. purchases of imported goods and services for another year: real spending on imports increased 13 percent dur-

ing 1999. In tandem, anemic export growth and the surge in imports caused the trade deficit to widen markedly in 1999, to about 2.8 percent of GDP.

Labor Markets and Inflation

The U.S. work force enjoyed another year of solid job growth and rising real wages in 1999. The unemployment rate in each of the final 3 months of the year was 4.1 percent, the lowest since January 1970. Real wages increased for the fifth straight year. Despite the tight labor market, core consumer prices, which exclude food and energy prices, increased by 1.9 percent, their slowest pace in nearly 35 years, although a sharp rise in the price of oil sent energy prices up and caused overall consumer price inflation to move upward. At the aggregate level, these statistics paint a rosy picture indeed. Chapters 4 and 5, however, discuss the ongoing challenge of making sure that the gains from this prosperity are shared as widely as possible.

Employment

Nonfarm payroll employment expanded by about 2.7 million jobs during 1999. Employment in the service sector grew rapidly in 1999, and employment in the government sector posted its strongest gain in 9 years, which was entirely due to growth at the State and local levels. Since January 1993, Federal employment (excluding the postal service) has declined by 18 percent, while private nonfarm employment has increased by 21 percent. The number of manufacturing jobs, however, fell by 248,000 last year; this marked the second straight year of declines for this sector, which was particularly hard hit by the slowdown in export demand. Manufacturing employment had been increasing by 154,000 per year on average over 1993-97. But trends in this sector appeared to improve over the year. Manufacturing production increased more than 5 percent in 1999, and the pace of job reductions in the sector slowed in the latter part of the year.

The unemployment rate averaged 4.2 percent in 1999, down from 4.5 percent in 1998. The average annual unemployment rate has fallen for 7 straight years now, and in 1999 unemployment stood at its lowest annual rate since 1969. The benefits of the decline in unemployment have been widely spread. The unemployment rate for nonwhites, for example, fell to 7.0 percent, its lowest annual rate in 30 years. This excellent performance also extends to other labor market measures. The official definition of unemployment counts as unemployed only those who are looking for work. If one adds to the standard definition those who currently want a job but have not been looking (so-called marginally attached workers), the jobless rate of this combined group was 5.0 percent in 1999, down from 5.4 percent in 1998. Indeed, the number of persons desiring a job but not looking has declined in each of the 5 years since these statistics were first collected.

The labor force participation rate—the percentage of the population over age 16 that is either employed or looking for work—remained at 67.1 percent in 1999 for a third straight year. In the early 1990s the participation rate appeared to have plateaued, ending an upward trend from the mid-1960s through 1990 that saw this rate rise from about 59 percent to 66.5 percent. This long-term trend was driven by an increase in the participation rate of women that more than offset a small decline in that of men. In the second half of the 1990s the overall participation rate rose again, reflecting the expansion of the Earned Income Tax Credit and welfare reform. Today participation stands at its highest annual rate ever recorded. With the participation rate stable and the unemployment rate down, the employment-to-population ratio—the proportion of the civilian population aged 16 and older with jobs—rose to 64.3 percent last year, topping the record set in 1998.

Productivity and Compensation

Labor productivity in the nonfarm business sector increased by 2.8 percent on an annual basis during the first three quarters of 1999. This marks the fourth consecutive year of strong productivity growth. The recent surge in productivity follows on the heels of more than two decades of relatively slow productivity growth (1.4 percent on average over 1973-95). For comparison, the average annual rate of productivity growth over this century has been about 2 percent. We examine in detail the causes and consequences of shifts in productivity trends below.

Compensation per hour in the nonfarm business sector increased 4.6 percent at an annual rate during the first three quarters of 1999. The strong housing market helped boost compensation in the construction industry, while a slowdown in mortgage refinancing likely was behind the dropoff in compensation growth in the finance, insurance, and real estate sector, relative to the rate in 1998. Not only has compensation growth been strong, but a larger share of it is going into the pocketbooks of workers in the form of higher wages and salaries. According to the employment cost index, growth in benefit costs has been remarkably subdued on average over the last 5 years, in large part because of a sharp slowing in the growth of medical insurance costs. Previously, growth in benefits, especially health insurance, had caused the benefit share of employment costs to rise. Medical insurance costs began to rise again in 1999, however: the 12-month change was 5.8 percent compared with 2.5 percent in 1998.

The real consumption wage—compensation per hour deflated by the CPI-U-RS, an index published by the Bureau of Labor Statistics that provides a more consistent measure of inflation than the standard consumer price index (Box 2-1)—increased 2.0 percent at an annual rate over the first three quarters of 1999. This gain in real wages is below the brisk rates of the last 2 years but well above the 1.4 percent annual average increase over 1960-98 (Chart 2-6).

Box 2-1. The CPI-U-RS, a Consumer Price Index with More Consistent Methodology

As noted in previous editions of the *Economic Report of the President*, some of the recent deceleration in measured consumer prices is attributable to a series of changes in the methods used to compute the CPI. When making changes to its methods of computing the CPI, the Bureau of Labor Statistics does not revise past official CPI data using the newer method. In 1999, however, the agency produced a research version of the CPI, called the CPI-U-RS (the RS stands for "research series"), in which 14 methodological revisions adopted since 1978 and still in use today are applied back to that year. Throughout this edition we use the CPI-U-RS rather than the CPI-U as a deflator when appropriate. (The text and chart footnotes indicate which series is being used.)

The new measure shows CPI inflation to have been lower than the official estimate over 1977-98 by an average 0.45 percentage point (see table). The difference is a percentage point over the 1977-82 period; revised methods of measuring the cost of home ownership account for most of the difference. In 1983 the BLS replaced a measure of home ownership costs based on purchase price and mortgage interest rates with a measure based on rental equivalence—roughly, what the homeowner would pay to rent the same house.

Estimated Effect of Specific Methodological Changes on the CPI-U

[Average annual percentage-point effect on December-to-December percent changes]

Type of change incorporated	1977 to 1982	1982 to 1986	1986 to 1997	1997 to 1998	1977 to 1998
Rental equivalence	-0.86	0.00	0.00	0.00	-0.21
Revised formulas	-.28	-.26	-.41	-.23	-.34
Other changes	.14	.13	.06	.00	.09
Total changes	-1.00	-.13	-.35	-.23	-.45

Note.—Detail may not add to totals because of rounding.

Source: Department of Labor (Bureau of Labor Statistics).

A second important change, in 1999, was the switch to geometric rather than arithmetic (fixed-weight) aggregation of price measurements within the lowest-level subcategories in the market basket. This revision, which applies to low-level categories comprising 61 percent of consumer expenditures, resolved two problems: the "functional form bias" in rotating new stores into the sample, and the assumption

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Box 2-1.—*continued*
of no substitution between competing products within most categories. The effect of applying this geometric aggregation is largest before 1995, when both problems affected the official series. The functional form bias was eliminated in 1995 for food and in 1996 for other products, and so the effect of geometric aggregation on the discrepancy between the series diminishes. The effect of this formula change is lumped together with a few other formula changes in the second line of the table.

The BLS has omitted a few hard-to-measure methodological changes from the CPI-U-RS, albeit with small effects. Among these are the new procedures for hospital prices (implemented in 1997) and the switch to a new method of sampling (which began to be implemented in 1999) that may allow new products to enter the CPI earlier in their life cycle.

The CPI-U-RS includes methodological improvements but not the periodic updates of the CPI market basket designed to take account of changing spending habits. In 1998, for example, the 1982-84 market basket was replaced with the 1993-95 basket. This change lowered CPI inflation by roughly 0.2 percentage point relative to a CPI weighted by the earlier market basket. Beginning in 2002, the BLS plans to update the market basket every 2 years rather than approximately once every decade.

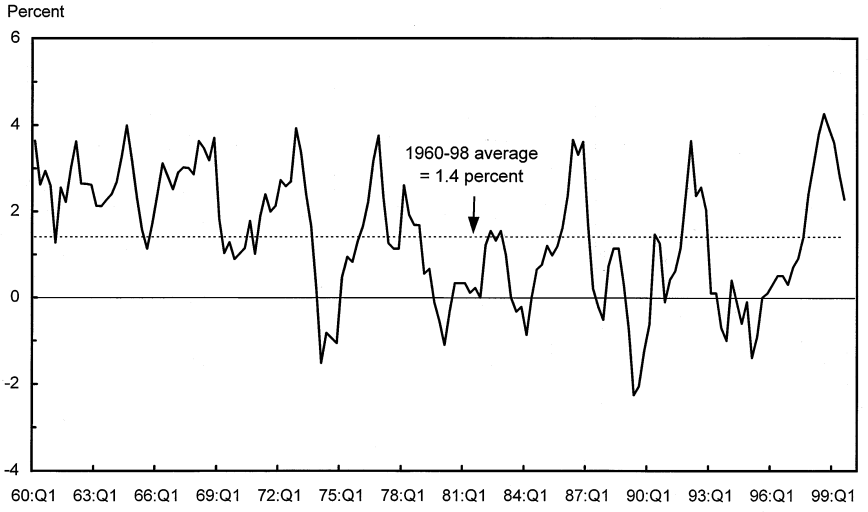
Taken together, the methodological improvements instituted beginning in 1995, combined with the recent update of the market basket, are estimated to result in roughly a 0.6-percentage-point slower annual increase in the CPI in 1999 compared with the methodologies and market basket used in 1994.

But the growth in real wages in 1997 and 1998 was boosted by the effect of declining energy prices on CPI inflation. Arguably, deflating compensation by the core CPI provides a clearer picture of underlying real consumption wage trends. If energy and food prices are removed from the equation, the real consumption wage increased 2.7 percent at an annual rate over the first three quarters of 1999, slightly surpassing the 2.6 percent annual average increase over 1996-98.

Prices

Inflation picked up in 1999 from its very low 1998 pace. The CPI increased 2.7 percent over the 12 months of 1999, after rising 1.6 percent during 1998. The chain-weighted price indexes for GDP and PCE increased 1.6 and 2.0 percent, respectively, over the four quarters of the year. These inflation rates were also up from their 1998 levels. More than the total increase in consumer price inflation can be attributed to energy prices, which

Chart 2-6 **Growth of Real Compensation per Hour (Nonfarm Business Sector)**
Real hourly compensation posted another strong gain in 1999, but with energy prices pushing up CPI inflation, the increase was smaller than in the 2 preceding years.



Note: Compensation per hour is deflated by the CPI-U-RS. Data are changes from four quarters earlier.
Source: Department of Labor (Bureau of Labor Statistics).

started to rise in March and continued to do so over the course of the year, reversing a 2-year slide. Oil prices were a main factor in the down-and-up pattern of energy prices. The price of West Texas Intermediate (WTI), a standard benchmark for oil prices, stood at year's end at about $26 per barrel, a bit above its level at the end of 1996, but well above that of a year ago, when WTI cost about $11 per barrel.

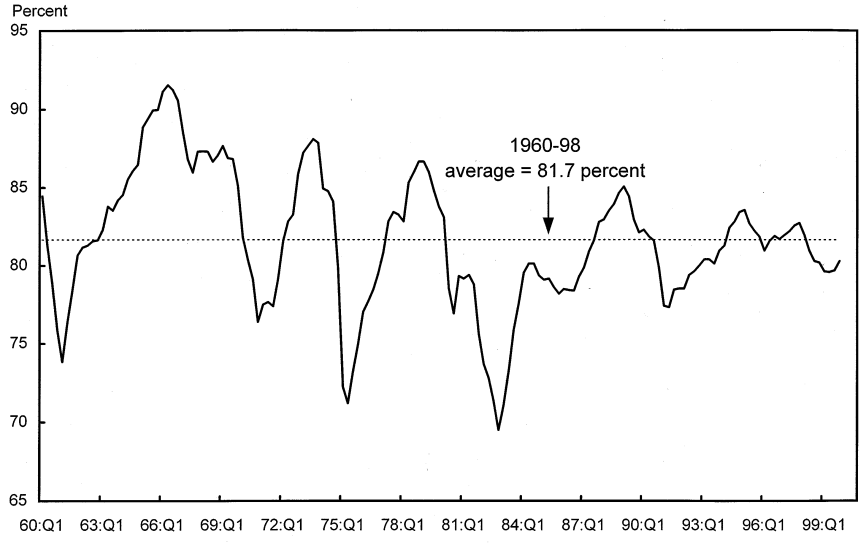
Core inflation, in contrast, has remained subdued. On a consistently measured basis, the core CPI-U-RS increased only 1.9 percent over the 12 months of 1999, slightly below the previous year's 2.2 percent increase. By comparison, core CPI-U-RS inflation has averaged 2.3 percent over the last 7 years. Core PCE prices, which also exclude the food and energy components, increased by only 1.5 percent over 1999 as a whole, after rising 1.4 percent in 1998. Since the fourth quarter of 1992, core PCE prices have risen only 1.9 percent per year on average. The CPI and the PCE price index differ in the goods and services they cover and in their method of computation, but by either measure core inflation has remained remarkably stable and low throughout this expansion.

A number of factors have helped keep core inflation in check despite another year of strong output growth and tight labor markets. First, prices for nonpetroleum imported goods were little changed over the year, after declining more than 3 percent over 1998. The market basket on which the CPI is based includes imported goods, so that changes in the prices of these goods

feed directly into the index. Moreover, falling prices of imported goods discourage domestic producers from raising their prices as much as they otherwise might. A second factor that restrained inflation is the existence of spare capacity in the manufacturing sector (Chart 2-7). Although labor markets have been tight, capacity utilization in manufacturing remained below its historical average, reflecting weak manufacturing growth in 1998 and rapid increases in capacity. Purchasing managers' lead times have been stable for most of the past 2 years, suggesting an absence of production bottlenecks, but lead times began to lengthen in 1999.

A third reason for the moderation seen in price increases is that gains in labor productivity have partly offset increases in compensation. As noted,

Chart 2-7 **Capacity Utilization (Manufacturing)**
Capacity utilization rose in 1999 but remains below its historical average.



Source: Board of Governors of the Federal Reserve System.

compensation per hour increased 4.6 percent at an annual rate over the first three quarters of 1999. Over the same period, output per hour increased 2.8 percent at an annual rate. The growth rate of unit labor costs—the difference between the growth rates of compensation per hour and of output per hour—was 1.8 percent at an annual rate over the first three quarters, slightly below the 2.1 percent rate recorded in both 1997 and 1998. Even with labor markets tight, large increases in productivity have played an important role in counteracting the wage part of the wage-price spiral typically associated with a high-employment economy. A more extensive discussion of the relationships among import prices, productivity, and inflation is provided below.

Inflation expectations remained low and stable throughout the year, supporting restraint in wage and price setting. According to the Michigan Survey of Consumers, the median expectation over the next 5 to 10 years is for inflation under 3 percent; that figure changed little over the year. Similarly, professional forecasters' expectations of long-term inflation continue to be low and stable, according to a survey conducted by the Federal Reserve Bank of Philadelphia.

Financial Markets

By comparison with the tumultuous events of the preceding year, 1999 was a relatively tranquil year for financial markets. Even the looming century date change and the potential it posed for Y2K-related disruptions did not seem to unsettle the markets (Box 2-2). The Federal Reserve raised the target Federal

Box 2-2. Economic Impact of Y2K Preparations

One of the most anticipated events of the past year was the rollover from the year 1999 to 2000. The public and the private sectors in the United States and abroad devoted enormous resources to ensure that the Y2K bug did not spoil the new year. Moreover, anecdotal evidence suggests that businesses and households stocked up near the end of the year as a precaution against supply shortages. In the end these preparations paid off, and only minor Y2K-related glitches were reported.

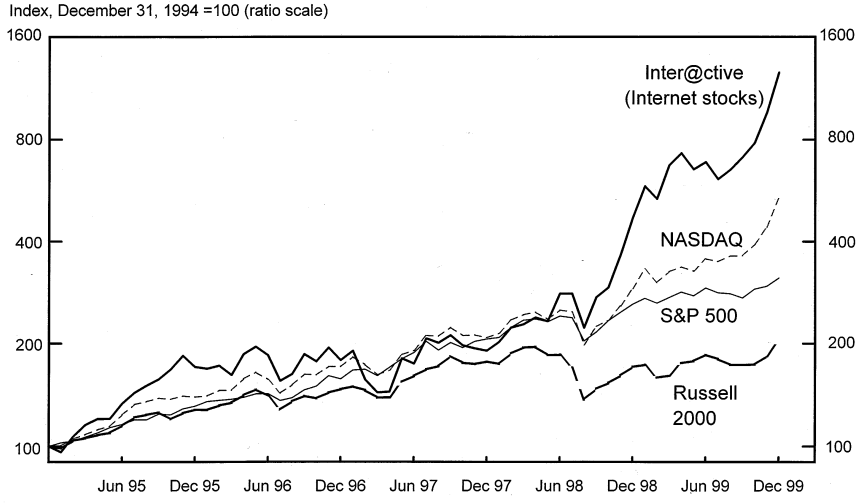
Potential Y2K disruptions involving information systems in the financial sector both in the United States and abroad had been a central concern well before the century date change. The smooth and efficient operation of financial markets and the banking sector relies on the extensive use of computers for record keeping, data exchange, and electronic transactions. The Federal Reserve and the President's Council on Year 2000 Conversion tracked efforts by financial institutions to ensure that records would be accurately maintained and that operations would continue running smoothly over the transition to the new millennium.

To allay concerns about a year-end shortage of liquid assets, the Federal Reserve took steps to assure markets that adequate liquidity would be available. The Fed also acted to ensure that sufficient quantities of cash would be available to the public at year's end. It was widely believed that many people intended to withdraw abnormally large amounts of cash near the end of the year, as a precaution against Y2K-related glitches at banks and automatic tellers. In anticipation of this rise in demand for cash, the Federal Reserve increased its order for currency through September by over 50 percent from the previous year. The Fed also implemented measures making it easier for banks to order and take delivery of cash. Public cash holdings rose by about 5 percent in December, an amount easily accommodated.

funds rate (the interest rate that banks charge one another for overnight borrowing) by 75 basis points in three steps, fully reversing the rate cuts it had instituted in the second half of 1998 during the global financial crisis. The yield on 30-year Treasury bonds rose more than 1¼ percentage points over the course of the year, reflecting a number of factors in addition to the Fed rate hikes. These included a rebalancing of international portfolios as the financial crisis receded, and concerns that continued strength in the U.S. economy would cause the Federal Reserve to further increase the Federal funds rate.

The stock market recorded another year of strong gains, with the S&P 500 index of stock prices rising 20 percent in 1999 (Chart 2-8). But the overall strength of the stock market in 1999 masks a sizable disparity in performance among stocks. In 1999 fewer than half of the stocks in the S&P 500 index rose in value. In contrast, despite similar overall growth, during the first 4 years of the bull market over 70 percent of those stocks rose in any one year. Stock gains were concentrated in a few sectors, mostly those associated with high technology. In the mid-1990s the technology-heavy NASDAQ index grew at about the same rate as the broader S&P 500, but its growth rate has been about triple that of the S&P 500 in the last 2 years. Even more impressive is a popular average of Internet-related stocks, which increased about 160 percent per year over the past 2 years.

Chart 2-8 **Equity Prices**
Led by the technology-heavy NASDAQ, stock markets continued to record large gains in 1999. Internet stocks skyrocketed.



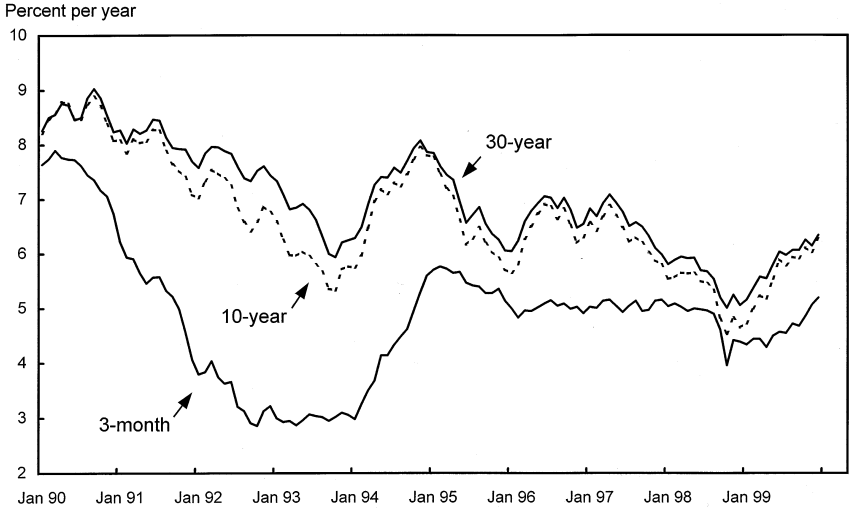
Sources: Frank Russell Company, Inter@ctive Week Online, National Association of Securities Dealers Automated Quotations, Standard & Poor's.

The Calm Following the Storm

The year 1998 had been an especially stormy one for financial markets. The Asian crisis in 1997 and the Russian debt default in August 1998 had precipitated a series of dramatic events in U.S. financial markets. Investors, including foreigners, had sought to reduce exposure to risk by selling high-risk investments and buying Treasury securities. This "flight to quality" had in turn bid up prices of Treasury securities, driving Treasury yields down (Chart 2-9). Corporate bond premiums (the spread between the yield on corporate bonds and Treasury securities), especially those on high-yield bonds, had risen sharply. New issuance of private debt had dried up, and debt markets became less liquid. For a time in the late summer of 1998, even the previously imperturbable bull market in stocks had turned bearish. Owing in part to concerns that financial markets were freezing up and that a credit crunch might follow, the Federal Reserve had cut the Fed funds rate three times, in September, October, and November 1998, from 5.5 percent to 4.75 percent.

With the economy continuing to surge ahead and the unemployment rate dropping to nearly 4 percent, the 30-year Treasury yield ended the year about 125 basis points above its level at the end of 1998. Premiums on investment-grade corporate bonds fell back to levels somewhat above those prevailing before the Russian crisis. Premiums on high-yield bonds stayed elevated relative to early-1998 levels, reflecting in part the high default rate among busi-

Chart 2-9 **Yields on Treasury Securities**
Treasury yields on short-, medium-, and long-term securities rose in 1999, more than reversing their declines of the previous year.



Source: Department of the Treasury.

nesses with below-investment-grade bond ratings. Liquidity flowed freely again, with new debt issuance rebounding. Overall, markets appear to have returned to a state of relative normalcy, but with a renewed appreciation of the risks associated with investments of all kinds.

Financial Modernization

Last year witnessed a watershed event that will change the way financial institutions meet the needs of the American people. The Gramm-Leach-Bliley Act (GLB), which the President signed into law in November 1999, updates the rules that have governed the financial services industry since the Great Depression. Prior to GLB, the Glass-Steagall Act of 1933 and the Bank Holding Company Act of 1956 had largely prohibited banks from being affiliated with firms involved in underwriting securities or insurance. The financial services industry had been undergoing rapid change for several decades; affiliations among banks, security firms, and insurance companies have already occurred in the marketplace. By repealing those prohibitions and allowing banks to merge with other financial institutions, the new law will stimulate competition, increase consumer choice, and reduce costs for consumers, communities, and businesses while still providing an appropriate statutory framework for community reinvestment and privacy protection.

GLB preserves the important role of the Community Reinvestment Act, guaranteeing that banking institutions will continue to meet the needs of potentially underserved communities. No bank may take advantage of the new opportunities that GLB provides unless it shows that it is satisfactorily meeting the credit needs of its community in general, and low- and moderate-income neighborhoods in particular. GLB also provides some protection for the privacy of consumers by giving them the right to know whether their financial institution intends to share their financial data with others, and the right to stop that release of private information to unaffiliated third parties.

The Stock Market Boom

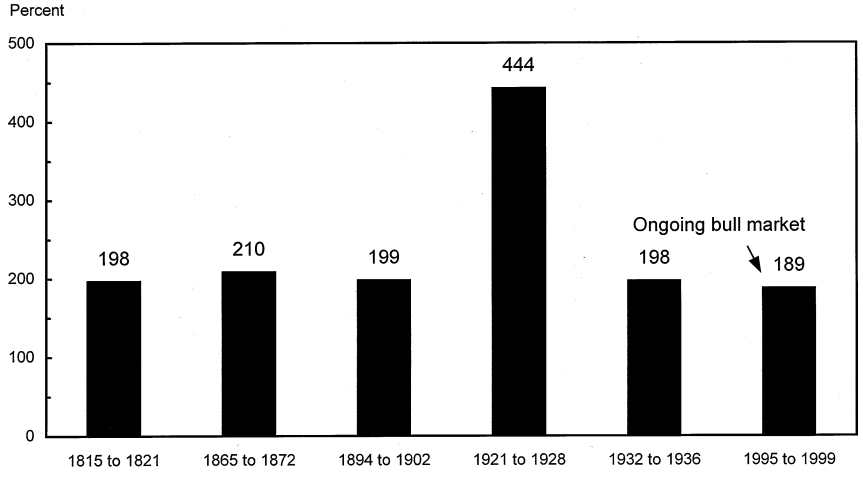
Stock market performance in the 1990s was truly exceptional. An investment of $100 in December 1989, with all dividends reinvested, would have been worth nearly $500 at the end of 1999, for a total return of close to 400 percent. Adjusted for inflation, the real return would still have been well over 250 percent. The bull market of the last 5 years has been particularly impressive, with a total real return of nearly 200 percent, or 24 percent per year on average. This total return makes the current bull market already the strongest since that of the 1930s and the sixth best ever (Chart 2-10). (We define a bull market as persisting in a given year so long as the real return to stocks is positive over the year.) Interestingly, whereas the bull market of the 1930s represented a recovery from the 1929 market crash, the gains of the last 5 years

have built on top of strong stock market performance in the 1980s and early 1990s. Many economists profess surprise at the remarkable bull market of the 1990s; others offer explanations for the sustained run, including a decline in the risk premium that investors demand in return for holding stocks, and a rise in expected corporate productivity and profits.

The first step in evaluating the performance of the stock market is to consider what determines the price of an asset (such as a share in a corporation) that yields a risky return. A share of common stock provides the owner with a claim on a portion of the issuing corporation's future profits. Hence the share price should equal the present discounted value of the corporation's net profits (that is, after payments to employees, suppliers, bondholders, and other creditors) divided by the number of outstanding shares. The discounting of future profits reflects two factors: the opportunity cost associated with waiting for those future profits, and a premium related to the uncertainty about whether those profits will materialize. The opportunity cost of receiving a dollar next year equals the interest an investor would receive by buying a risk-free bond instead of the share of stock. Because a stock can be a risky investment, investors demand a rate of return on stocks that is above that on a relatively safe bond.

Changes in fundamentals such as corporate profits and interest rates appear to explain some but not all of the dramatic runup in stock prices. Corporate profits grew impressively over the 1990s, but not by as much as stock prices.

Chart 2-10 **Cumulative Real Returns in the Top Six Bull Markets Since 1802**
Only five previous bull markets in stocks have accumulated higher returns than the one that began in 1995.



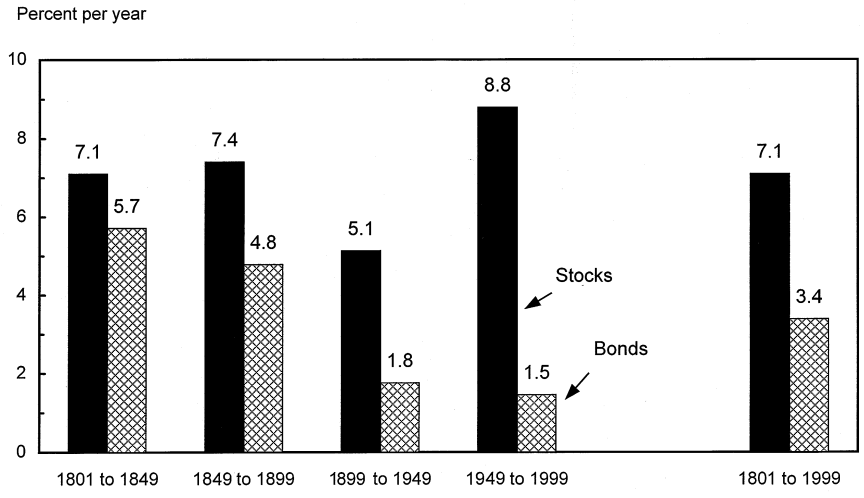
Note: Returns include reinvested dividends. A bull market is defined to persist in a given year so long as the real return to stocks is positive over the year.
Source: Jeremy Siegel, University of Pennsylvania.

From 1989 to 1999, corporate earnings more than doubled, and forecasts of future earnings were strong, on average, at the end of 1999. The inflation-adjusted yield on Treasury bonds, meanwhile, is little changed from its level of 10 years ago and thus has provided only a slight impetus to stock prices over the decade as a whole. The extraordinary rise in stock prices relative to actual profits has therefore led economists to hypothesize that changes have occurred beyond those measured by these fundamentals. One proposed explanation is that investors have reduced the premium that they demand for holding stocks. A second is that the outlook for future profits is brighter than commonly thought and that stock prices today more accurately reflect the true productivity and profitability of American businesses. We consider each hypothesis in turn.

The Equity Premium

From 1989 to 1999 the average annual real stock market return was over 14 percent, about 8½ percentage points higher than the average annual real return on long-term government securities. Although this level of return on stocks has been extraordinary, the fact that it has far exceeded the return on government bonds is nothing new. In fact, the excess return of stocks over bonds—the equity premium—has averaged about 4 percentage points over the last two centuries. The equity premium has also varied considerably over time, and over the second half of this century it has averaged about 7.3 percentage points (Chart 2-11).

Chart 2-11 **Real Stock and Bond Returns Since 1801**
Over the past two centuries, stock returns have exceeded returns on bonds over long periods.



Note: Returns include reinvested interest and dividends. The bond data are based on long-term government bonds when available; if not, similar highly-rated securities were used.
Source: Jeremy Siegel, University of Pennsylvania.

The additional riskiness of stock returns over that of bond returns does not appear large enough to justify an equity premium of over 7 percentage points, unless investors are extraordinarily risk-averse or their investment horizon is very short. For this reason, economists have long been puzzled by the large excess returns that the stock market has historically offered.

One explanation for the recent runup in stock prices is that investors may have been responding to the fact that stocks have historically yielded much higher returns than bonds over the long haul. In this view, the stock market was simply undervalued in the past, and the recent runup in prices was necessary to bring valuations in line with the fundamentals. Two developments may have spurred this behavior. First, the cost of owning a diversified portfolio of stocks has fallen with the creation of a growing number of low-cost mutual funds. Diversification reduces the risks associated with holding stocks and therefore should reduce the equity premium that investors demand as compensation for risk.

A second development is that a new generation of investors is now in the market, and the aversion of older investors to the risks of equity investing may have diminished. Investors may have had lingering memories of the bear market of the late 1960s and early 1970s, when the Dow Jones Industrial Average (adjusted for inflation) fell by more than 60 percent over 6 years. Some perhaps even remembered the Great Crash of 1929, when the Dow fell 64 percent in real terms over 3 years. Investors' attitudes toward the stock market, and their tolerance for risk, may have only recently recovered from these painful episodes. Meanwhile many from the baby-boom generation and later, who know bear markets only from history books, have become stock investors. Indeed, the older generation's recoil from stock investing may have been more emotional than rational. Even an unlucky investor who had invested in the stock market on the eve of the 1929 crash still would have realized a real return of nearly 6 percent a year, on average, over the next 30 years. In sum, both the low cost of diversification and changing attitudes toward the riskiness of stocks suggest reasons that may have led investors to bid up stock prices in the 1990s.

Intangible Capital

A second explanation for the bull market may be that investors have higher expectations for future corporate profits than they used to. In theory, the stock market value of a company should be closely related to the replacement value of its assets. For example, if a company owns only one asset, a factory that cost $10 million to build, the market value of that company should be $10 million (abstracting from other factors that affect its profitability).

One possible explanation for the rise in the stock market over the last decade is that U.S. businesses have accumulated large quantities of intangible capital in addition to physical capital (plant and equipment). Intangible cap-

ital includes the value of intellectual property (including patents from research and development investments), organizational structure, management expertise, and past investments in job training. These assets are not included in the national accounts' measure of physical capital but do raise the productive capacity of firms. In this view, stock market values—which should incorporate information about investments in tangible and intangible capital—should provide a better yardstick for capital than standard measures based on past investments in plant and equipment alone, which may understate the true productive potential of firms.

According to this explanation, the dramatic rise in the stock market value of corporate businesses during the 1990s derives from a large increase in their intangible capital stock, in addition to the increase implied by investments in plant and equipment. The implied surge in investment in intangible capital could have resulted from businesses' intensified efforts to increase efficiency and productivity. In addition, the explosion in information technologies and the Internet may have led to a surge in intangible capital investment, including the creation of new products and services and the redesign of production processes and management.

One implication of this hypothesis is that labor productivity growth should have increased sharply over the last few years, because workers now have more productive capital—both tangible and intangible—at their disposal. Although productivity growth has in fact increased, there is still too little evidence to support or reject the notion that the true productive capital stock has grown as rapidly as current stock market valuations imply.

It is inherently difficult to measure and evaluate the different variables, including perceptions of risk and profitability, that factor into stock market prices. The proper valuation of technology stocks—the group that has driven much of the market's growth in the last 2 years—is particularly tricky. Some of these stocks currently have low or even negative earnings but hold the potential for strong profits in the future. Because these companies lack the proven track record of long-term growth that more established firms usually have, their stock prices may in principle be more prone to volatility as investors revise their forecasts of future profits. Experts have a mixed record of perceiving the underlying determinants of stock values. As already noted, some were puzzled by the strength of the bull market in the late 1990s, yet the market continued to soar. On the other hand, Irving Fisher, one of the founders of financial economics, famously claimed just 2 weeks before the 1929 crash that "Stock prices have reached what looks like a permanently high plateau." In the final analysis, it is likely that neither of the two hypotheses described here will prove completely correct, and that several factors, perhaps including an overoptimistic view of future corporate profitability, have combined to propel the stock market upward.

Saving and Investment

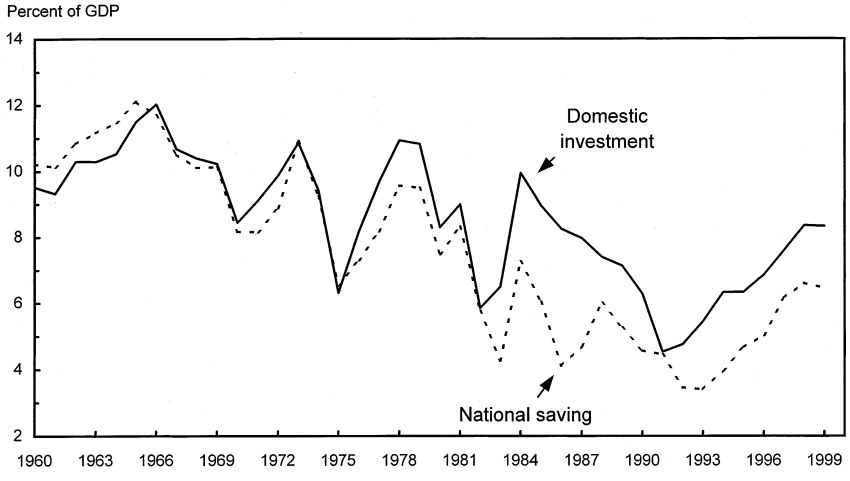
Investment is the economic bridge linking the present to the future. By deferring consumption today, we make available resources for investment, which increases our ability to produce and consume in the future. Over the last two decades, net domestic investment (gross investment minus capital consumption) has generally exceeded net national saving, and the difference has been made up by foreigners (Chart 2-12). Moreover, the share of GDP that was saved had been very low through much of the 1980s and early 1990s. This low rate of saving and its shortfall relative to domestic investment have led some to conclude that the United States is not "saving enough," especially in light of the upcoming retirement of the baby-boomers. The picture is not quite as clear, however, as these simple figures would suggest.

Trends in Saving

The ratio of net national saving to GDP has risen about 3 percentage points over the last 7 years. Despite this sizable improvement, this ratio remains low relative to its levels of the 1960s and 1970s. Indeed, if the national saving-GDP ratio were equal today to its levels in those decades, it would suffice to cover domestic investment.

The recent upward trend in net national saving is the net result of changes in the saving patterns of households, businesses, and governments. The ratio

Chart 2-12 **Net National Saving and Net Domestic Investment**
Net domestic investment has exceeded net national saving in most years since the 1960s. In 1999 the difference reached 2 percent of GDP.



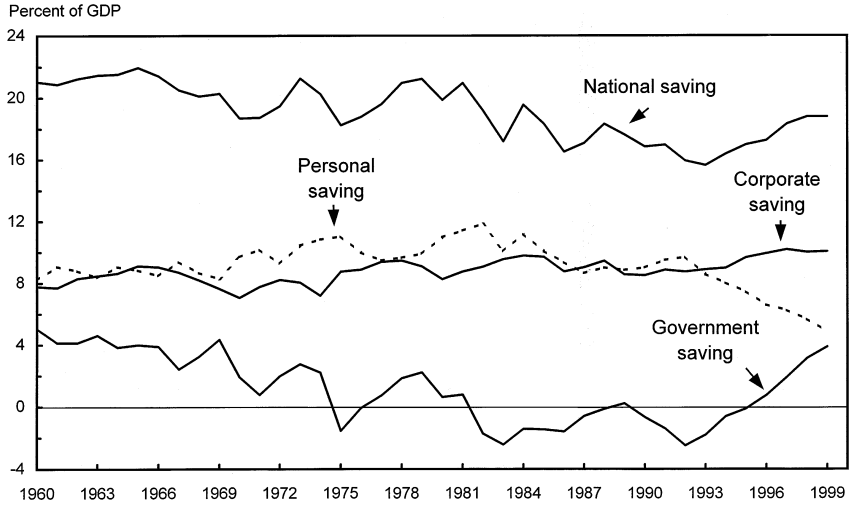
Note: Net national saving minus net domestic investment is equal to net foreign investment minus the statistical discrepancy. Data for 1999 are averages of first three quarters.
Source: Department of Commerce (Bureau of Economic Analysis).

of gross personal saving to GDP has declined nearly 5 percentage points over the last 7 years. However, over the same period, the gross national saving rate—the sum of personal, business, and government saving—has increased by 3 percentage points (Chart 2-13). The source of this difference lies in the reversal of the role played by the Federal Government, which has transformed itself from a major borrower into a major saver. In addition, State and local governments have increased their saving as a share of GDP. Corporate saving has also been on a gradual upward trend through the 1990s. Yet as already noted, despite these positive developments in government and business saving, the national saving rate remains low relative to its 1960s and 1970s levels. There are, however, reasons to believe that the measured national saving rate does not accurately portray the accumulation of assets capable of supporting future consumption.

Saving and Asset Accumulation

Although national saving is not as high today as in past periods, Americans have nevertheless been accumulating vast quantities of assets. The ultimate purpose of saving and investing is to provide resources for future consumption. To paraphrase Adam Smith, consumption is the sole end and purpose of all saving. In considering the ability to consume in the future, it makes sense

Chart 2-13 **Gross National Saving**
Relative to GDP, gross national saving held steady in 1999 as an increase in government saving offset a decline in personal saving, which fell to its lowest level in at least 40 years.



Note: Data for 1999 are averages of first three quarters.
Source: Department of Commerce (Bureau of Economic Analysis).

to look at not only how much we save, but also at how that saving is invested and how productive that investment is.

Much saving goes ultimately into business investment, where it raises future productivity and thus output. The reported nominal national saving and investment rates conceal an important development, namely, a sharp decline in the relative price of business equipment, owing in large part to quality improvements in capital goods. One dollar of saving buys more business equipment, on a quality-adjusted basis, today than before. As a result, the increase in productive business assets corresponding to the average dollar saved by Americans has risen over time.

The recent runup in the stock market, already discussed, allows an even more optimistic view on asset accumulation. Real household stock market wealth has more than doubled since 1995. To the extent that this runup in stock prices reflects an increase in the productive capacity of U.S. corporations—say, owing to investments in intangible capital or especially high returns to investments in information technologies—this increase in wealth augurs a real increase in future sustainable consumption. On the other hand, rises in share prices resulting from changes in U.S. investors' willingness to hold stocks or from overly optimistic views of future earnings do not imply additional resources available for national consumption.

The upswing in the national saving rate over the last several years provides an encouraging sign regarding the Nation's preparations for the future. To the extent that recent saving is more productive than past saving, so much the better. In any case, the Federal Government can further advance this favorable trend in national saving by maintaining fiscal discipline, paying down the debt, and thereby raising government saving.

The End of the Business Cycle?

Growth has been a defining characteristic of the U.S. economic experience over the last century, but only when viewed from a long perspective: employment and income have often deviated, sometimes sharply, from their rising long-run trends. Time and again the economy has risen over a period of years to a temporary peak of activity, only to fall back downward, bottom out at a trough, and from there once again begin to rise. These peaks and troughs represent turning points of the business cycle; an expansion is defined as the period that starts from a trough and ends when a new peak is reached. Although the business cycle has been a recurring feature of the U.S. economy for as far back as we have reliable data, some observers have argued that the economy in the 1990s has fundamentally changed and that the concept of the traditional business cycle is outdated.

The beginnings and ends of U.S. business cycles are determined well after the fact by the Business Cycle Dating Committee of the National Bureau of Economic Research (NBER), a private, nonprofit organization of professional economists. For instance, the March 1991 trough that marked the beginning of the present expansion was not announced by the committee until December 1992. In identifying the monthly dates for peaks and troughs, the committee looks for across-the-board movements in a large array of economic indicators such as output, income, and employment. Using this methodology, the NBER has determined that since 1854 there have been 31 expansions and 31 recessions, representing 30 peak-to-peak business cycles, not including today's ongoing expansion. Although they are called "cycles," these economic fluctuations are neither regular nor predictable. The longest expansion to date was that of the 1960s, which lasted 106 months. (The current expansion is expected to pass that mark in February 2000.) The longest contraction on record lasted over 5 years, from the October 1873 peak to the March 1879 trough, whereas the shortest lasted only 6 months, from January to July 1980.

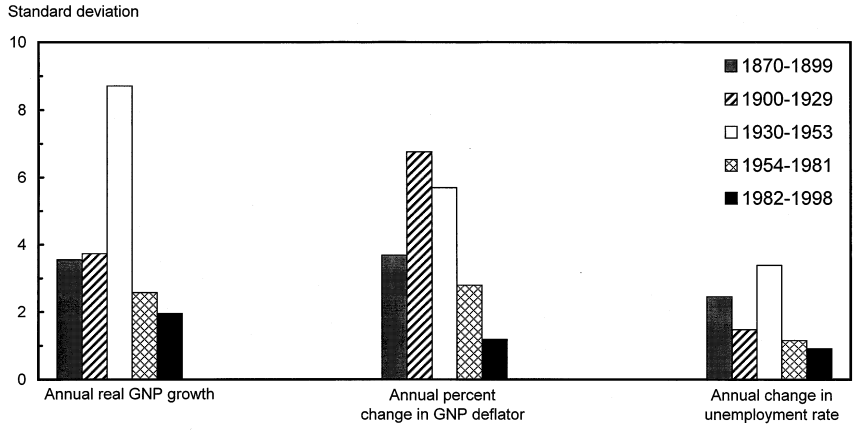
The Changing Nature of Business Cycles in the United States

Forty-one years ago a former chairman of the Council of Economic Advisers predicted that "The business cycle is unlikely to be as disturbing or troublesome to our children as it once was to our fathers." Research quantifying the degree to which business cycles have moderated over time confirms this view. If the severity of economic fluctuations is measured in terms of the output lost during a recession, the 14 recessions between 1900 and 1953 cost on average about three times as much as the 7 recessions since then. Even if the Great Depression of the 1930s is excluded, recessions in the earlier period still were on average more than one and a half times as severe as those in the 1954-99 period.

Other evidence supports the notion that business cycle fluctuations have diminished over time. From 1982 to 1998, fluctuations in GNP and unemployment were on average about 20 percent smaller than they were from 1954 to 1981, and fluctuations in inflation were less than half as large on average (Chart 2-14). With the caveat that data from the 19th century and the early 20th century are less reliable than and not directly comparable to recent data, business cycle fluctuations appear to have become less severe in the second half of the 20th century than in earlier periods.

One other way to think about the postwar moderation of the business cycle is in terms of the length of time that the economy has spent in recession and the amount of time it has spent in expansion. The average length of expansions nearly doubled in the second half of the century, from about 2½ years during 1900-53 to about 5 years since then, and the average length of economic contractions has fallen from about 17 months to less than 11 months.

Chart 2-14 **Fluctuations in Output, Inflation, and Unemployment**
Business cycle fluctuations have been less severe on average in the second half of the 20th century than in earlier periods.



Note: Unemployment data begin in 1891.
Sources: Department of Commerce (Bureau of the Census and Bureau of Economic Analysis); Department of Labor (Bureau of Labor Statistics); Christina D. Romer, "The New Prewar Business Cycle Reconsidered: New Estimates of Gross National Product, 1869-1908," *Journal of Political Economy*, 1989, and "Spurious Volatility in Historical Unemployment Data," *Journal of Political Economy*, 1986.

Sources of Business Cycle Moderation

One source of moderation in the business cycle is the changing nature of the U.S. economy. Historically, inventories have been one of the most volatile components of spending. Businesses now tend to operate with much leaner inventory stocks than before, and they appear to be better able to adjust these stocks to changing economic conditions. The composition of output has also tended to move from more volatile toward less volatile sectors. Spending on services, which tends to be relatively insensitive to cyclical fluctuations, made up over half of GDP in 1999, compared with less than a third in 1950. Conversely, the cyclically sensitive manufacturing sector makes up a smaller share of aggregate output and employment than in the past.

The growing role of stabilization policies—fiscal and monetary policies, which buffer the effects of destabilizing influences on the economy—may also have contributed to this moderation of the business cycle. Over the last century, the role of fiscal policy in affecting the business cycle not only has grown but has indeed changed fundamentally. At the beginning of the 20th century, the Federal Government's role in the economy was tiny. In 1900 there was no Federal income tax and no Social Security, and total Federal receipts equaled a mere 3 percent of GNP. The Nation's monetary policy was generally one of simple adherence to the gold standard, which limited the use of monetary policy as a stabilizing tool.

The Federal Government's role in macroeconomic stabilization grew in importance following World War II. Although the income tax had been

introduced in 1913 and Social Security in 1937, by 1940 income and payroll taxes equaled only 3 percent of GNP. Income and payroll tax revenue rose thereafter as a share of GNP and has averaged around 14 percent over the last 30 years. It amounted to over 16 percent of GNP in 1999. The role and character of monetary policy likewise underwent a fundamental transformation during the late 20th century. Recent experience supports the view that modern monetary policy can achieve the long-run goal of price stability while aiding in the cause of short-run macroeconomic stabilization by "leaning against the wind" when macroeconomic imbalances develop.

Do Expansions Die of Old Age?

One question that has intrigued economists is whether each expansion contains the seeds of its own destruction. Is it true that the longer an expansion lasts, the more likely it is to end in the next quarter or the next year? Studies find no compelling evidence that postwar expansions possess an inherent tendency to die of old age. Instead, they appear to fall victim to specific events related to economic disturbances or government policies. For instance, the Iraqi invasion of Kuwait, which led to a doubling of oil prices in the fall of 1990, contributed to the decline in economic activity during the recession of 1990-91. American consumers, having suffered through the tripling of oil prices in 1973-74 and their subsequent doubling in 1979, anticipated negative repercussions on the U.S. economy, and consumer confidence declined sharply and consumption fell.

An example of policy affecting the end of an expansion is the Federal Reserve's successful disinflation at the end of the 1970s and in the early 1980s. In 1979 the CPI inflation rate reached 11 percent. Under a new chairman, the Federal Reserve dedicated itself to a renewed effort to reduce inflation, which fell 8 percentage points over 4 years, to about 3 percent by the end of 1983. As a result, the short expansion that started in July 1980 came to a halt one year later. With the Federal funds rate peaking at just over 19 percent in June 1981, the economy fell into a 16-month recession, during which the unemployment rate rose above 10 percent.

An Expansion Is Only as Old as It Feels, and This One Still Feels Young

Although the current expansion entered its 105th month in December 1999—what might be considered old age, based on the history of U.S. business cycles—it still appears young and vibrant when compared to the later stages of past long expansions. What is noteworthy in today's economy is the absence of developments that are frequently identified with the twilight of an expansion. In particular, productivity has accelerated during the last several

years, rather than stagnated as in other mature expansions, and price inflation has been on a falling, not a rising, trend.

In the later stages of the two previous long expansions, productivity growth slowed to just above a 1 percent annual rate (Table 2-2). In contrast, over the last 2 years, productivity has been growing nearly 3 percent a year, in part owing to rapid business investment. Strong productivity growth has enabled the economy to grow rapidly and helped restrain the cost pressures typically associated with a strong economy.

Inflation trends provide a second sign of an expansion's age and health. Late in the expansions of the 1960s and the 1980s, high rates of utilization and decelerating productivity contributed to an acceleration in prices, that is, a rising inflation rate. In the current expansion, even with unemployment well below 5 percent, the acceleration in productivity has helped keep inflation stable. In fact, inflation has fallen relative to the previous 2-year period. Surveys of inflation expectations provide a further encouraging sign that inflation remains in check: these surveys show that both consumers and professional forecasters expect inflation to stay low over the next several years. Some have argued that the U.S. economy is now nearly immune to the business cycle, because of the effects of increased international competition, rapid innovation and productivity growth, and improved flexibility of the production and distribution systems.

TABLE 2-2.— *The Late-Expansion Economy and the Current Expansion*
[Average annual percent change, except as noted]

Item	Last 2 years of earlier expansions		Most recent 2 years of current expansion
	1967 Q4 to 1969 Q4	1988 Q3 to 1990 Q3	1997 Q4 to 1999 Q4
Real GDP per capita	2.5	1.6	[1] 3.4
Unemployment rate [2]	3.5	5.3	4.4
Productivity [3]	1.3	1.1	[4] 3.0
Real business fixed investment	6.0	3.1	[1] 10.0
CPI-U-RS [5]	5.3	4.7	2.0
CPI-U-RS acceleration [6]	2.1	.9	-.4

[1] Preliminary.
[2] Percent; annual average for 1968-69, 1988 Q4-1990 Q3, and 1998-99.
[3] Output per hour worked in the nonfarm business sector.
[4] Change through 1999 Q3.
[5] For pre-1978 data, CPI-U used.
[6] Percentage-point difference in 2-year average annual inflation rate from that of preceding 2 years.

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

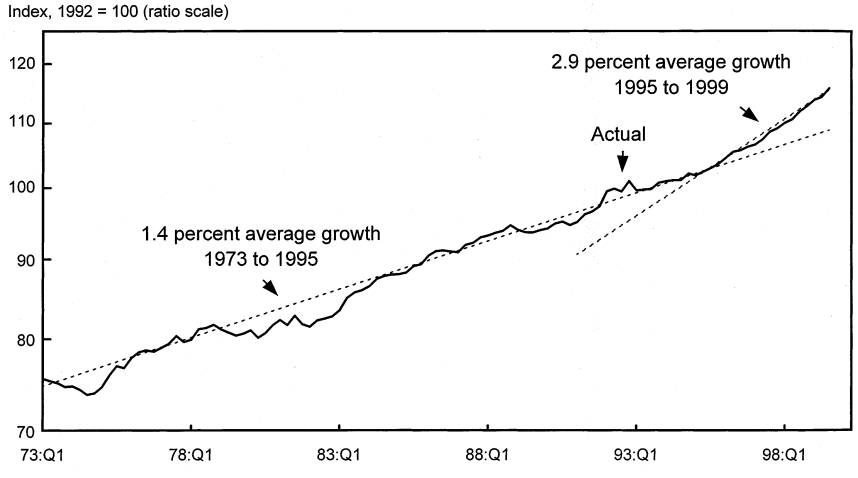
Of course, it is premature to declare the business cycle dead. But there are reasons to believe that the economy will continue to perform as well as, if not better than, it has in the recent past, with less of the roller-coaster ride that characterized the 1970s and early 1980s (not to mention earlier decades). Unlike in the 1980s and early 1990s, fiscal discipline is now the order of the day. Projected surpluses can now be used to pay down the debt and free up capital for investment in education, business, and technology, spurring faster growth. Likewise, the Federal Reserve no longer follows the stop-and-go policies of the 1970s, but instead practices a systematic policy that fosters price stability and long-term growth.

The Economic Outlook

As always, the growth of the supply-side components of GDP underlies the projection of long-term growth. In particular, the prospect for continued productivity growth is the key issue in the economic outlook and the source of many of the upside and downside risks to the Administration's projection.

Labor productivity trended upward at an average annual rate of 1.4 percent from 1973 to 1995 but then accelerated to a 2.9 percent clip over the past 4 years (Chart 2-15). The unexpected surge in productivity growth has led to several positive developments: it has restrained inflation, allowing the unemployment rate to fall lower than it otherwise might; it has increased econom-

Chart 2-15 **Labor Productivity (Nonfarm Business Sector)**
Labor productivity trended upward at an average annual rate of 1.4 percent from 1973 to 1995. It then accelerated to a 2.9 percent clip over the past 4 years.



Note: Productivity is the average of income- and product-side measures. Productivity for 1999 is inferred from the first three quarters.
Sources: Department of Commerce (Bureau of Economic Analysis) and Department of Labor (Bureau of Labor Statistics).

ic growth, with positive effects on the Federal budget balance; and it has boosted stock market valuations.

Over the past 4 years, the income-side measure of output, gross domestic income, has grown half a percentage point per year faster than the product-side measure, gross domestic product. Because measurement error enters into both, the Council of Economic Advisers believes that we learn something from each, and therefore the following discussion focuses on an average of the two measures in discussing trend productivity and potential output.

What Has Caused Productivity Growth to Rise?

Because the apparent acceleration in productivity is less than 4 years old, its cause and future continuation remain controversial. A year ago, available data showed productivity growth to be within the range of normal cyclical variation. But more recent data, especially the October benchmark revision to the national accounts (Box 2-3), place the acceleration on more solid footing. National accounts revisions result from changes in price measurement and new definitions as well as the arrival of new data. Abstracting from the first two, the data-based revision over 1995-98 allows us to advance the start of the acceleration at least to 1997 and perhaps as early as 1995. And insofar as the revised data are more accurate, they make the identification of the acceleration more credible. The Council's analysis finds that two developments account for half of this acceleration: an increase in capital—especially computer and software capital—and productivity growth in the computer-producing sector.

Labor productivity increases when workers have more capital to work with. Capital deepening has been a persistent feature of the U.S. economy since World War II, as capital services per hour has increased in almost every year. Yet in 1995, business investment as a share of GDP climbed above its long-term average, and it has continued upward since. As a result, capital services per hour grew faster after 1995 than before. Estimation using preliminary data and established methods of growth accounting (that is, weighting the growth rate of capital services per hour by capital's cost share) finds that capital deepening accounts for 1.53 percentage points of annual labor productivity growth during the 1995-99 period. This is up from 1.06 percentage points during the 1973-95 period (second line in Table 2-3). The difference between these growth rates shows that capital deepening accounts for 0.47 percentage point of the 1.47-percentage-point acceleration in productivity after 1995 (Table 2-3, column 3). Investment in computers and software accounts for all of this gain from capital deepening. (Official data on capital services will not be released until mid-2000, and so these calculations remain tentative.)

This contribution from capital deepening is important, but it is not the whole story. Although capital deepening contributes to labor productivity growth in the long run, it has not been a reliable guide to year-to-year fluctu-

Box 2-3. What Did We Learn from the GDP Benchmark Revision?

The Commerce Department's benchmark revision of the GDP statistics, released by the Bureau of Economic Analysis last October, incorporated new data from the last full economic census (conducted every 5 years) and from the benchmark input-output accounts from 1992, as well as from the revised annual sources that are usually incorporated in the annual July GDP revision. The benchmark revision also provided an opportunity to change accounting definitions and to make the pre-1995 accounts consistent with current methods of deflation.

Spending. Over the 11-year period from 1987 to 1998, revisions raised the annual rate of growth of real GDP by an average of 0.4 percentage point. The revisions fall into three main categories (Chart 2-16): revisions to source data, revisions to the methods used in adjusting for inflation, and new definitions of spending categories and subcategories.

Incorporating new source data from the economic censuses and other sources added about 0.2 percentage point per year to growth since 1994 but had little impact on earlier years.

Changes in deflation methodology accounted for the largest component of the benchmark revision for the 1987-94 period. This change reflects the retrospective application of current CPI methods to the years 1978-94. (These methods were already in use for the post-1994 period.)

Among several new definitions introduced, the most significant is the inclusion of computer software purchases in investment, which raises the growth rate of real GDP by an average of 0.18 percentage point per year over 1987-98. By 1998 the cumulative impact of these definitional changes was to raise the measured level of nominal GDP by 2.0 percent and the growth of real GDP since 1959 by 3.5 percent.

Income and saving. In the GDP accounts, pension plans for government employees were moved from the government to the household sector, so that employer contributions to (and interest and dividends earned by) these pension plans are now classified as personal income. On the other hand, pension benefit payments were removed from the transfer income component of personal income. This reclassification boosted personal saving but reduced government saving by an offsetting amount. The personal saving rate still shows a marked decline over the 1990s but was no longer negative in 1999 as it was under the old GDP accounts. New source data boosted measured wages and salaries substantially in 1998, adding to income and saving.

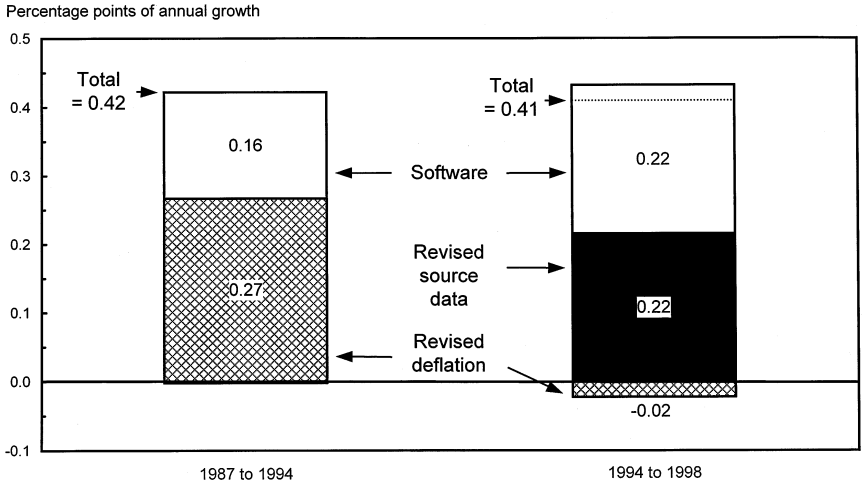
With software now classified as investment, software depreciation is added to the income side of the accounts. Although the new definition boosted gross national saving, net saving is changed little.

Productivity. The reclassification of software as investment and the improvements in deflation methodology boosted measured productivity

continued on next page...

Box 2-3.—*continued*
growth over most of the historical period affected by these revisions and had been anticipated. In contrast, the changes brought about by the new source data were unexpected and revealed that productivity (on a consistently measured basis) had been growing faster than had been previously believed.

Chart 2-16 **Sources of Revisions to Real GDP Growth**
Revised deflation methods explain most of the upward revision to real GDP growth for the 1987 to 1994 period, but half of the post-1994 revision is due to new source data.



Note: Revised deflation is a residual category that may include other factors. The partition of the real GDP revision into three parts is approximate. Detail may not add to totals because of rounding.
Sources: Department of Commerce (Bureau of Economic Analysis) and Council of Economic Advisers.

ations in productivity. In addition, the power of capital deepening to explain even long-run changes can be overstated. For example, capital shallowing accounts for very little of the post-1973 productivity slowdown.

Increasing quality of the work force has been another persistent feature of U.S. economic growth. The American work force has become better educated, and since about 1980 the average worker is more experienced. Nothing dramatically new happened to the index of labor composition (which measures the effect of education and work experience on productivity) after 1995, but it may have added an additional 0.05 percentage point to labor productivity growth after 1995 (third line in Table 2-3).

Besides their role in capital deepening, computers enter GDP directly as part of consumer durables and business investment. Hence, productivity growth in the production of computers contributes directly to overall pro-

TABLE 2-3.—*Accounting for the Productivity Acceleration in the 1990s*

[Average annual percent change, except as noted]

Item	1973 to 1995	1995 to 1999	Acceleration[1]
Labor productivity	1.43	2.90	1.47
LESS: Contribution of			
Capital services	1.06	1.53	.47
Labor quality	.26	.31	.05
Computer sector total factor productivity	.16	.39	.23
EQUALS: Total factor productivity excluding computers	-.06	.65	.70

[1] Percentage points.

Note.—Labor productivity is the average of income-and product-side measures of nonfarm business output per hour worked.
Data for 1999 estimated by Council of Economic Advisers.
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) for hours and labor quality; Macroeconomic Advisers, LLC for capital services; and Council of Economic Advisers.

ductivity growth. Productivity growth has been particularly rapid in the computer-producing sector. A measure of productivity in the computer-producing sector would capture this direct effect. However, it is impossible to be precise about computer sector productivity because of the difficulty in measuring the real inputs (such as engineering and other business services) to this sector from other sectors. In lieu of a direct productivity measure, the rate of decline in the relative price of computers tells us something about quality improvement in the computer sector. The price of computers relative to that of nonfarm output, which had been falling at an 18 percent average annual rate before 1995, fell at a 29 percent annual rate thereafter, indicating an acceleration in computer quality after 1995. An estimation that weights these changes by the share of final sales of computers in nonfarm output (about 1¼ percent) finds that improved computer quality added 0.23 percentage point to the post-1995 acceleration (fourth line of Table 2-3). (These methods and estimates are, of course, approximate; one study using different methods attributes most of the acceleration in trend productivity to the computer-producing sector.)

These three explanations—capital deepening, changing labor composition, and rising computer quality—may account for half of the post-1995 acceleration in productivity. The other half reflects all the other factors that affect productivity growth. These may include cyclical influences and new efficiencies from the use of the Internet, especially for business-to-business transactions.

The Outlook for Productivity

Can the factors that account for the more rapid pace of labor productivity growth since 1995 be sustained? The data provide a mixed but, on balance, positive picture.

The trend toward a more educated work force seems likely to continue with support from the Administration's policy of promoting investment in education and job training. Moreover, the median age of the work force will continue to rise through at least 2008, when the leading edge of the baby-boom generation retires. But these trends are not expected to shift, and as a result, the contribution of labor composition to productivity is not likely to change much from its historical average of 0.3 percentage point per year.

The decline in the relative price of computers has been particularly rapid over the past 4 years, and so it is prudent to expect that this rate will return to its long-term rate of about 20 percent per year. If that happens, computers' contribution to productivity growth will drop from about 0.4 to 0.3 percentage point per year.

The growth rate of capital services per hour increased in 4 of the past 5 years, reaching 5.4 percent in 1999—a rate that implies a 2-percentage-point yearly contribution of capital deepening to labor productivity growth. For 2000 the pace of capital deepening is likely to increase further, because the current level of investment is already very high. (The rate of growth of capital services depends on the level of investment.) Projections over the longer run are more speculative, but the level of nominal investment is expected to remain high relative to nominal output. The President's budget proposal—in which the Federal Government continues to pay down the Federal debt—also promotes this investment. This high-investment economy is likely to promote a continued strong pace of capital deepening and strong productivity growth.

Besides the contributions of labor and capital, cyclical and other considerations enter the productivity forecast. Most important, the level of productivity in 1999 was likely above its trend, as hiring probably has not caught up with the surge in output, and many vacancies probably remain unfilled. A model that allows labor productivity to differ from its trend because of these cyclical influences estimates the trend of labor productivity growth at a 1.8 percent annual rate since 1990, up from a 1.6 percent annual rate from the peak of the previous business cycle to 1990. Simulations from this model overestimate the level of productivity from 1993 through 1997 and underestimate it thereafter. Although these errors may stem from the lack of a role for capital deepening in the model, this omission has the offsetting benefit that the estimate of the long-term trend in labor productivity is not overly sensitive to cyclical movements in investment spending.

Second, the projection depends on the time horizon. A projection for the near future extrapolates recent trends, whereas a projection for the distant

future extrapolates long-term trends. Near-term projections ought to balance the probable continued role of capital deepening in supporting strong productivity growth with the likelihood that a lot of job vacancies will be filled. Weighting these considerations, the Administration projects the trend rate of increase in labor productivity at 2.2 percent per year for 1999-2002, which is down from the nearly 3 percent pace actually observed over the past few years. The projection of productivity growth then begins to fade toward its long-term rate, with growth of 2.0 percent for 2003-05 and then 1.8 percent for 2006-10. Productivity over the entire 1999-2010 interval is projected to grow at a 2.0 percent average annual rate.

Supply-Side Components of GDP

In addition to productivity, the factors on the supply side whose effects on GDP growth sum to total GDP growth include population, the labor force participation rate, the employment rate, the workweek, and the two additional ratios shown in Table 2-4. In line with the latest projection from the

TABLE 2-4.—*Accounting for Growth in Real GDP, 1960-2007*

[Average annual percent change]

Item	1960 Q2 to 1973 Q4	1973 Q4 to 1990 Q3	1990 Q3 to 1999 Q3	1999 Q3 to 2007 Q4
1) Civilian noninstitutional population aged 16 and over	1.8	1.5	1.1	1.1
2) PLUS: Civilian labor force participation rate [1]	.2	.5	.0	.0
3) EQUALS: Civilian labor force [1]	2.0	2.0	1.0	1.1
4) PLUS: Civilian employment rate [1]	.0	-.1	.2	-.1
5) EQUALS: Civilian employment [1]	2.0	1.9	1.2	1.0
6) PLUS: Nonfarm business employment as a share of civilian employment [1 2]	.1	.1	.4	.2
7) EQUALS: Nonfarm business employment	2.1	2.0	1.6	1.2
8) PLUS: Average weekly hours (nonfarm business)	-.5	-.4	.1	.0
9) EQUALS: Hours of all persons (nonfarm business)	1.6	1.7	1.7	1.2
10) PLUS: Output per hour (productivity, nonfarm business)	2.8	1.5	2.0 [3] 2.4	2.0
11) EQUALS: Nonfarm business output	4.5	3.1	3.8 [3] 4.1	3.2
12) PLUS: Ratio of real GDP to nonfarm business output [4]	-.3	-.2	-.5 [3] -.7	-.3
13) EQUALS: Real GDP	4.2	3.0	3.2 [3] 3.4	[5] 2.8

[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] Income-side definition.
[4] Line 12 translates nonfarm business output back into output for all sectors (GDP), which includes the output of farms and general government.
[5] GDP growth is projected to fall below its underlying trend for this period (about 3 percent) as the employment rate is projected to fall 0.1 percent per year over this period.

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

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

Bureau of the Census, the working-age population is projected to grow at almost 1.1 percent annually through 2007 (a bit faster than projected last year). In line with the latest projection from the Bureau of Labor Statistics, the labor force participation rate is projected to increase by less than 0.1 percent per year. The length of the average workweek is projected to remain about flat over the entire projection horizon. In contrast, the employment rate is projected to decline roughly 0.1 percent per year as the unemployment rate edges up to 5.2 percent—the middle of the range judged consistent with long-run inflation stability. From 2008 on, growth in the working-age population slows a bit, and the labor force participation rate begins to fall as the first wave of the baby-boom cohort reaches the early retirement age of 62.

Budget Effects of a High-Investment Economy

An economy fueled by high investment—especially in computers—will be characterized by two forces that partly offset the positive effects on the Federal budget of faster productivity growth: higher depreciation and a larger wedge between the CPI and the GDP price index.

A high-investment economy is an economy in which a large share of output is required to replace worn-out capital, simply because more investment means more capital goods to be depreciated. The share of nominal business fixed investment in nominal GDP, which had averaged 11 percent since 1959, increased to about 12½ percent by the end of 1999 and is likely to increase further in the near term. The 1½-percentage-point increase in the investment share thus far portends a similar increase in the share of total gross domestic income claimed by depreciation. As depreciation claims an increasing share of income, less room will be available for the taxable components such as profits and wages and salaries.

The rapid decline in computer prices, together with an increasing nominal share of computers in GDP, also has negative effects on the Federal surplus through the "wedge" between the CPI and the GDP price index. A larger wedge reduces the Federal budget surplus because cost-of-living adjustments for Social Security and other indexed programs increase with the CPI, whereas Federal revenues increase with the slower-growing GDP price index. The effect is reinforced by the fact that the CPI is also used to index income tax brackets and other features of the tax code.

Rapid declines in computer prices increase the wedge, because computer prices have a 10 times larger weight in the GDP price index (1.1 percent) than in the CPI (where the December 1999 relative importance weight is only 0.11 percent). For example, computer price declines held down the increase of the GDP price index by 0.23 percentage point but reduced CPI inflation by only 0.03 percentage point.

Over the past 6 years, the CPI-U-RS has increased 0.6 percentage point per year faster than the GDP price index. The projected wedge is in line with this historical average, as the Administration's inflation projection flattens out after 2002 at 2.6 percent for the CPI and 2.0 percent for the GDP price index (Table 2-5).

TABLE 2-5.—*Administration Forecast*

Item	Actual		2000	2001	2002	2003	2004	2005	2006
	1998	1999							
	Percent change, fourth quarter to fourth quarter								
Nominal GDP	5.9	[1] 5.9	4.8	4.6	4.6	4.5	5.0	5.1	4.9
Real GDP (chain-type)	4.6	[1] 4.2	2.9	2.6	2.5	2.5	3.0	3.0	2.9
GDP price index (chain-type)	1.1	[1] 1.6	1.9	2.0	2.0	2.0	2.0	2.0	2.0
Consumer price index (CPI-U)	1.5	2.7	2.3	2.5	2.6	2.6	2.6	2.6	2.6
	Calendar year average								
Unemployment rate (percent)	4.5	4.2	4.2	4.5	5.0	5.2	5.2	5.2	5.2
Interest rate, 91-day Treasury bills (percent)	4.8	4.7	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Interest rate, 10-year Treasury notes (percent)	5.3	5.7	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Nonfarm payroll employment (millions)	125.8	[1]128.6	129.9	131.1	132.9	134.5	135.2	136.3	138.3

[1] Preliminary.

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.

What Has Held Inflation in Check?

During the past 2½ years the key measures of inflation have remained low and stable despite an unemployment rate below 5 percent. Previous experience suggests that such a sustained period of low unemployment would push up the inflation rate. Yet inflation, as measured by the four-quarter change in the price index for GDP and the core CPI, has remained remarkably subdued.

In the 1995 and 1996 editions of the *Economic Report of the President*, the NAIRU, the unemployment rate consistent with stable inflation, was estimated to lie in a range centered around 5¾ percent. There is growing evidence that the NAIRU has fallen below that level. Indeed, several studies using statistical methods that allow the NAIRU to change over time estimate a pronounced drop in the late 1990s. Possible causes include spare manufacturing capacity, new efficiencies in the labor market from the expanded use of temporary help workers and Internet job search resources, higher-than-expected productivity growth, and declining import prices. Manufacturing capacity was discussed previously; the other factors are considered below.

The Changing Labor Force

Over the past two decades, the aging of the baby-boom generation has reduced the proportion of younger workers in the labor force. In the mid- and late 1970s, young baby-boomers swelled the ranks of the youngest segment of the labor force: in 1978 nearly 25 percent of American workers were between the ages of 16 and 24. As the baby-boom generation aged, this share fell and is now about 16 percent. Because younger workers are typically more prone to unemployment spells than older workers (the unemployment rate of workers aged 16-24 is nearly three times that of workers over 25), this aging of the labor force reduced the overall NAIRU. According to recent estimates, the changing age profile of American workers accounts for about 0.7 percentage point of the reduction in the NAIRU during the 1980s but had no significant further effect in the 1990s.

Rising education levels may also have brought down the NAIRU. The 1980s and 1990s were a period of marked increases in the educational attainment of the U.S. labor force. In 1998, for example, 57 percent of workers had some college education, up from about one-third in the mid-1970s. Unemployment rates are consistently lower for groups with more years of schooling. For instance, the unemployment rate for those with no high school diploma averages about 4 percentage points higher than for those with a high school diploma but no college. And the unemployment rate of those with a high school diploma but no college degree is about 3 percentage points higher than that for college graduates. These differences in unemployment rates may also reflect other worker characteristics that are correlated with education, however, obscuring any causal link between educational attainment and the NAIRU.

Temporary Help Agencies

The rapid growth of the temporary help industry may also have contributed to a decline in the NAIRU. Temporary help agencies have existed since the 1920s, but their role in labor markets expanded greatly during the 1980s and 1990s. Between 1982 and 1999, total employment in this industry increased more than sevenfold, and the industry's share of overall employment has grown from less than 0.5 percent in the early 1980s to more than 2.3 percent in 1999.

One way the temporary help industry may reduce the NAIRU is by creating short-term employment opportunities for workers who might otherwise be unemployed. Businesses in cyclical or volatile industries need flexibility to scale their payrolls up or down as demand fluctuates. Businesses frequently need temporary employees with specialized skills, who can substitute for permanent employees on leave. Similarly, the growing availability of temporary

work enables job hunters to work while they search for a permanent position and provides opportunities for people who desire to work intermittently.

Labor market data support the hypothesis that the temporary help industry creates employment opportunities. Thus far during this expansion, the temporary help industry has created 1.9 million new jobs, and this figure does not count those workers who found permanent jobs through their temporary assignments. Moreover, in 1997, 60 percent of all temporary workers would have preferred permanent positions, and about a third of this group were actively seeking permanent employment. This suggests that a significant proportion of temporary workers would have been unemployed in the absence of the temporary help industry. In fact, a recent study found that the unemployment rate in 1997 might have been up to 0.3 percentage point higher if only half of these "involuntary" temporary workers had remained idle while they sought permanent employment.

The Internet Job Market

Yet another partial explanation for the decline in the NAIRU is improved job matching through the Internet. The new medium has recently added to its many functions that of providing the virtual space for a burgeoning labor market. As both job hunters and recruiters discover its advantages, the Internet job market is rapidly becoming part of the mainstream job market. According to one study, nearly 60 percent of human resources managers used online recruiting in 1998, up from 13 percent in 1996. Moreover, a survey found that large companies are increasing the resources devoted to Internet recruiting.

A leading Internet jobs clearinghouse is America's Job Bank. Part of America's Career Kit (see Chapter 4), America's Job Bank is a partnership between the Department of Labor and the public employment services operated by the States. Funded by unemployment insurance tax revenues, America's Job Bank links 1,800 employment service offices around the country, aggregating information on over 1.5 million job seekers and a similar number of job opportunities in one convenient, easily accessible Internet site. Job hunters can post their resumes and search the job listing data base; firms can post job listings and search the resume data base. America's Job Bank charges no transaction or usage fees for either job seekers or employers.

Internet job sites such as America's Job Bank represent a more efficient mechanism for clearing labor markets than has been available before. These sites dramatically reduce the cost of the search process for both job hunters and recruiters, enabling labor market participants to investigate a greater number of opportunities in less time and at lower cost. One study found that the cost per hire of Internet advertising for an opening is about one-eighth that of traditional advertising methods. Such improvements in efficiency

make it easier and cheaper for job seekers to find suitable openings and for corporate recruiters to find suitable candidates.

Productivity and the NAIRU

Over long periods, labor productivity and real product wages (hourly compensation deflated by the price of output) move in tandem, because businesses can afford to give real wage increases that are justified by productivity gains, and competition forces them to do so. Eventually, a change in the rate of productivity growth tends to be matched by an equal change in the growth of both actual and anticipated real wages. Breaks in trend productivity growth, however, are difficult to recognize, and therefore wage and price inflation adjust only gradually to any change.

A significant break in the trend rate of productivity growth has occurred once before since accurate statistics have been kept. That break occurred after 1973. The productivity slowdown at that time elevated the NAIRU and contributed—along with demographics, oil price increases, and strong demand—to rising inflation in the late 1970s. During that period, nominal hourly compensation increased at a rate that would have been consistent with stable inflation if productivity had still been growing at its pre-1973 trend. Instead, because productivity growth had fallen, the higher compensation resulted in rising inflation of unit labor costs and prices. Making matters worse, many wage setters adjusted to the higher rate of inflation, creating a wage-price spiral. This process of rising inflation might have continued had the back-to-back recessions of 1980 and 1981-82 not raised the unemployment rate to 10 percent, well above the NAIRU. By the mid-1980s inflation was again stable, but gains in real hourly compensation (deflated by the output price) had settled down to about 1½ percent per year—a drop of almost half from the pace of the 1960s.

The acceleration in productivity after 1995 may have initiated a similar process, but in reverse, allowing the unemployment rate to fall lower, with less consequence for inflation, than would have been possible otherwise. The rate of growth of nominal hourly compensation has increased during recent years, but these nominal increases have not resulted in rising price inflation. Businesses have been able to grant these larger pay increases without raising price inflation, partly because increases in unit labor costs have remained stable as rising productivity growth offset the rising compensation gains.

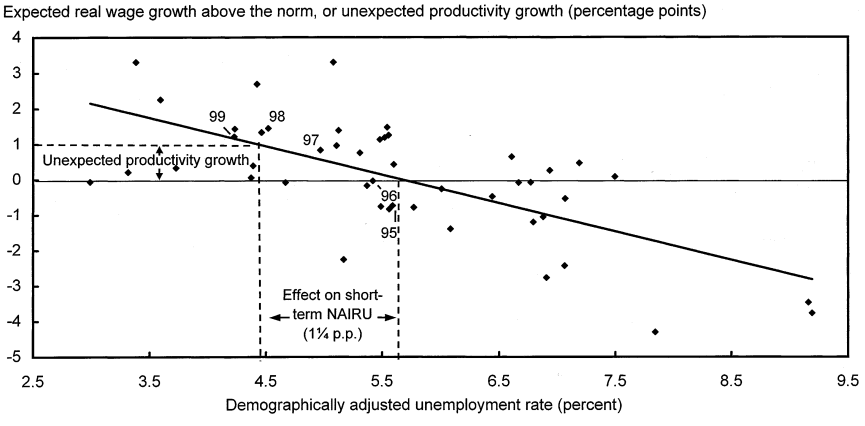
The new, higher trend growth rate of productivity since 1995 could have temporarily lowered the NAIRU, because it can take many years for firms and workers to recognize this favorable development and incorporate it into their wage-setting process. In the meantime, the productivity surprise can stabilize inflation of unit labor costs and prices even at unemployment rates below the previous NAIRU. The Phillips curve estimated from the scatter diagram in

Chart 2-17 shows how this could happen. It assumes that nominal increases in hourly compensation reflect three factors: a bonus for tight labor markets, as reflected in a low unemployment rate; a full adjustment for expected price inflation (with backward-looking inflation expectations); and a normal increase in real wages (which here will be called the "real wage norm"). The real wage norm may reflect prevailing views of the trend in labor productivity. But little is known about how the real wage norm is formed, and therefore the model is estimated on the assumption that the real wage norm reflects the previous year's increase in real hourly compensation.

With stable productivity growth, and with unemployment equal to the long-term NAIRU (where the diagonal regression line crosses the x-axis in the chart), wage and price inflation are stable from one year to the next. However, a 1-percentage-point positive surprise in productivity growth has the effect of temporarily lowering the NAIRU by 1¼ percentage point. With nominal wage growth unchanged and productivity growth higher, unit labor costs, and with them price inflation, would fall if the unemployment rate does not change. Only with a lower employment rate would unit labor costs and price inflation be stabilized. Hence the short-term NAIRU is lower.

The effect of the increase in productivity growth on unemployment probably will not last indefinitely. If productivity growth is maintained at its current high level, it will cease to be "unexpected," the real wage norm will eventually rise to that same level, and the short-term NAIRU will gravitate back to its long-term level.

Chart 2-17 **The Phillips Curve, Productivity, and the NAIRU**
If productivity grows 1 percentage point faster than expectations, the short-term NAIRU falls by 1¼ percentage point.



Note: Fitted 1953-99 data with fourth quarter-to-fourth quarter percent changes in hourly compensation and the price deflator for the nonfarm business sector. Wage and price inflation in 1999 are estimated based on the first three quarters. Annual average unemployment rate uses fixed (1993) labor force weights for six age-sex groups.
Sources: Department of Commerce (Bureau of Economic Analysis), Department of Labor (Bureau of Labor Statistics), and Council of Economic Advisers.

Declining Relative Import Prices

A decline in the relative price of imports can affect the short-term NAIRU in a manner similar to an acceleration of productivity. Competition from imports restrains the markup of prices over unit labor costs and thus reduces price inflation for a given rate of wage inflation. (A 1 percent decline in relative import prices lowers the inflation rate by 0.1 percentage point.) The 4 percent annual rate of decline in the price of nonpetroleum imports relative to U.S. nonfarm business prices during 1997 and 1998 lowered nonfarm price inflation by about 0.4 percentage point per year. The effect on the short-term NAIRU is similar to that of a productivity acceleration of the same magnitude and can be argued to have lowered the NAIRU by about 0.5 percentage point.

World price trends cannot be expected to continue to restrain inflation as much as they have in recent years. The relative price of nonpetroleum imports firmed in 1999, and with strength returning to overseas economies, these prices are likely to increase in 2000. In addition, the rebound in oil prices in 1999 may exert some upward pressure on prices of commodities that use oil as an input.

The Unemployment Forecast

The Administration's projection of the unemployment rate roughly follows its projection of the short-term NAIRU and reflects the factors just discussed. The short-term NAIRU, which has been centered around 5¾ percent over the postwar period and in the mid-1990s, probably fell into the 4 to 4½ percent range through the combination of the temporary help and Internet innovations to the labor market, the productivity surprise, falling relative import prices, and perhaps other factors. It is very difficult to quantify the long-term effects of the temporary help and Internet innovations to the labor market. For the purpose of its conservative forecast, the Administration estimates that they account for roughly a 0.5-percentage-point permanent reduction in the NAIRU from its historical average, to a range centered around 5.2 percent. In contrast, the effects of the productivity surprise and falling relative import prices are temporary and are expected to erode over the next several years. As a consequence, in the Administration's conservative projection, the unemployment rate edges up to 5.2 percent by 2003 and remains at that level thereafter.

The Near-Term Outlook

After growing at a 4.3 percent annual rate over the past 4 years, real GDP is projected to decelerate to an annual growth rate of 2.9 percent over the four quarters of 2000. This rate, which was slightly above the consensus projection

of professional economic forecasters when the GDP projection was finalized in November, is now a bit on the low side.

Because it constitutes two-thirds of GDP, consumption is expected to account for much of the expected deceleration. Personal outlays increased faster than disposable income in each of the past 7 years, and the saving rate plunged to 2 percent by the end of 1999. Although these consumption gains are consistent with the rapid rise in stock market wealth, they are not likely to persist unless the stock market continues to surge. More likely, real consumption growth will slow from its 5 percent rate over the past 2 years to rates consistent with the growth of real disposable income. However, if the stock market performs as well this year as it has in the recent past, it would present some upside risk to the Administration's projection.

Real business fixed investment has increased faster than real GDP in almost every year of this expansion. This pattern is expected to persist over the projection horizon as technological change boosts demand for computers and communications equipment. In contrast, real business purchases of industrial equipment have been nearly flat for the past year, and real investment in nonresidential structures has declined. If total demand slows as expected, purchases of these other investment goods and structures may decline.

Residential investment has been very strong, owing to continued gains in real disposable income and increases in wealth. With real incomes continuing to rise, housing starts are expected to remain high. However, the pace of residential investment is likely to fall back to a rate in line with the demographics of household growth.

Inventories remain quite lean in relation to sales. In fact, nonfarm inventories (measured as months of supply) have fallen to the lowest level on record. These lean stocks militate against any near-term threat to the expansion from excessive inventories. Nevertheless, as this report goes to press, there is speculation that firms may have stockpiled a buffer against Y2K disruptions before the turn of the year, planning to work off these stocks afterward.

Real exports, which had grown only 2 percent over the four quarters of 1998, grew 4 percent during 1999. The pickup may reflect an economic rebound among the United States' trading partners, especially those affected by the Asian economic crises. For example, Korean GDP grew at a 15 percent annual rate in the first three quarters of 1999 after falling 5 percent over the four quarters of 1998. Exports to a group of 10 major U.S. trading partners in East Asia, which fell $38 billion during the first year of the crisis (from the second quarter of 1997 to the second quarter of 1998), have recouped about half of that loss. A pickup is also evident among the 11 countries that have adopted the euro as their currency. In these countries GDP has accelerated to a 2.8 percent annual rate of growth during the first three quarters of 1999, from a 1.9 percent annual rate during the four quarters of 1998. The matur-

ing recovery among these trading partners is expected to lead to solid growth of U.S. exports for the next several years.

Even with this growth in export markets, however, net exports are likely to fall even further in the near future as U.S. demand for imports continues to outstrip foreign demand for U.S. exports. Nevertheless, the current account balance is expected to stabilize after 2001 and then improve, as foreign output growth boosts export demand while slower growth in the United States curbs import demand.

Interest rates are expected to remain flat over the entire 11-year projection span, at 5.2 percent (on a bank discount basis) for 91-day Treasury bills and 6.1 percent for the 10-year Treasury yield. Real interest rates, calculated by subtracting the Administration's expected rate of inflation (2.6 percent in the long term as measured by the CPI) from projected nominal rates, are projected to be similar to their historical averages.

On the income side, the Administration's projection is based on the long-run stability of the labor share of GDP. This share is flat over the projection period at about 58 percent—its historical long-run average. Wages as a share of total compensation are expected to erode slightly, as other labor income, especially medical insurance premiums, is expected to grow faster than wages. Because the labor share is projected to be flat and stable, so too is the capital share. However, the division of income within the capital share is not stable. As noted earlier, a rise in the depreciation share is a partial offset to the benefits of a high-investment economy, and this growing depreciation expense is projected to come at the expense of profits. Profits before tax, which were 9.2 percent of GDP in the third quarter of 1999, are projected to slide to about 7¼ percent of GDP by 2006.

A moderation in output growth to 2.5 percent is projected for 2001-03 (Table 2-5), 0.7 percentage point below the economy's potential growth rate at the beginning of that period. The tightness in labor and product markets at the beginning of the period is expected to dissipate during this slow-growth period. Over these 3 years, the unemployment rate is expected to edge up slowly to 5.2 percent, the middle of the range of unemployment compatible in the long run with stable inflation. From 2003 to 2007, the Administration's forecast is built around a 3.0 percent growth rate of potential output. From 2008 to 2010, real GDP slows further to a 2.6 percent annual rate, reflecting slower population growth and the anticipated retirement of the first wave of the baby-boom generation.

The Administration does not believe that annual growth of 3 percent is the best the economy can do; rather this projection reflects a conservative estimate of the effects of Administration policies to promote education and to foster a high-investment economy by paying down the national debt. The outcome could be even better—as indeed it has been for the past 4 years. But the

Administration's forecast is used for a very important purpose: to project Federal revenue and outlays so that the government can meet its responsibilities while living within its means. For this purpose, excessive optimism is dangerous and can stand in the way of making difficult but necessary budget choices. On the other hand, excessive pessimism can force difficult and possibly counterproductive decisions where none is required. In the final analysis, the only worthy objective is the creation of a sound forecast that uses all available information as fully as possible.

As of December 1999, the current economic expansion, having lasted 105 months, was the longest ever during peacetime and only a month shy of the longest on record. There is no apparent reason why this expansion cannot continue. As already noted, expansions do not die of old age. It is always difficult to forecast the future of the economy, but the current situation of low and stable core inflation and lean inventories reveals no obvious signs of an imminent slowdown. The most likely prognosis is therefore the same as last year's: sustained job creation and continued noninflationary growth.