

Outlook: 1990–2005

The U.S. economy into the 21st century

Gross national product is projected to increase 1.5 percent per year (low-growth scenario), 2.3 percent (moderate growth), or 2.9 percent (high growth) over the 1990–2005 period; key shifts are expected in consumer, business, and government spending, and foreign trade

Norman C. Saunders

The Bureau of Labor Statistics has prepared projections of the U.S. economy to the year 2005, our first look into the 21st century. The new projections, with 1990 as the base year, extend previously published projections.¹ As with prior aggregate economic projections, three alternatives have been developed: low growth, moderate growth, and high growth. These alternatives are designed to examine a range of production possibilities over the next 15 years, a range based on different assumptions regarding those factors most open to question in future periods of time.

The moderate-growth projection is characterized by a gross national product (GNP) influenced by slowing labor force growth, an improved balance of foreign trade, some improvements in labor productivity, several key shifts in the distribution of the demand components of GNP, and a gradually improving Federal budget balance. In comparison, the high-growth model has stronger labor force and labor productivity growth, marked shifts in demand toward investment and exports, but with somewhat less optimistic foreign trade balances. Finally, the low-growth version contains lower estimates of population and labor force growth and a continuation of recent trends in demand shares and labor productivity growth.

Any attempt to look into the future is an endeavor filled with uncertainty. The alternative

projections prepared by BLS provide users with a range of results, a range which encompasses reasonable economic futures, but which in no sense completely exhaust all of the variations possible. The potential GNP and employment growth are determined by many factors, all subject to a wide range of values which may be chosen. The alternatives provided in this article attempt to address that uncertainty, at least for those variables deemed most critical in the process of determining GNP.

By 2005, under the assumptions used by the Bureau in developing these projections, GNP is expected to range between \$5.2 trillion and \$6.4 trillion (in 1982 dollars). This translates to an average annual rate of growth for real GNP of 1.5 percent in the low-growth alternative, 2.3 percent in the moderate growth, and 2.9 percent in the high alternative over the 1990 to 2005 period, contrasting with a historical rate of GNP growth of 2.9 percent between 1975 and 1990. Real disposable personal income ranges between \$3.7 and \$4.6 trillion, and disposable income per capita is predicted to range between \$35,000 and \$44,800, compared with the 1990 level of \$15,700.

Framework of the projections

More than 200 exogenous variables are provided to a macro-economic model used to gener-

Norman C. Saunders is an economist in the Office of Employment Projections, Bureau of Labor Statistics.

Base period comparisons

The horizon for this latest set of BLS projections is 15 years—from the base year 1990 to the target year 2005. To compare a set of projections with what has happened in the past, it is helpful to present the preceding historical period of an equal number of years, in this case, 1975 to 1990. That period is used in all of the major tables of the five articles in this series. However, no one historical period can adequately describe the events shaping the behavior of all of the individual variables considered in the projections. For that reason, the texts of the articles may refer to other, more representative, historical periods.

A further difficulty results from the fact that 1975 was the second year of a deep recession. Gross national product had declined, in real terms, for 2 consecutive years and the unemployment rate for 1975 was 8.5 percent. This inevitably leads to some distortion of growth rates computed from a base year of 1975 if one is attempting to assess long-term historical growth for the economy. The following table compares the 1975–90 rates of growth for selected items with those from 1973–90 and from 1979–90—both years generally accepted to be nearer the trend line of long-term growth. When those periods are compared with the projections, they are more like the projected period for most variables than is the 1975–90 period.

Another problem from a comparison perspective is that the U.S. economy entered a recession in June 1990. It is difficult to assess at the current time the extent that this recession has affected the past growth rates and how

much it will affect the 1990–2005 rates.

The reader of these articles is alerted to pay careful attention to the historical periods discussed in the texts and to be aware of apparent growth rate anomalies present in the 1975–90 period as they evaluate the results of the projections presented in this issue of the *Monthly Labor Review*.

Item	Historical			Moderate projection 1990–2005
	1973–90	1975–90	1979–90	
GNP, 1982 dollars	2.5	2.8	2.4	2.3
Personal consumption	2.8	3.1	2.7	2.3
Investment	1.7	4.0	1.7	2.7
Exports	5.8	6.5	5.3	4.5
Imports	5.4	6.1	6.0	3.7
Government	2.2	2.3	2.7	1.3
Population	1.0	1.0	1.0	.8
Labor force	2.0	1.9	1.6	1.3
Employment (household concept)	1.9	2.1	1.6	1.3
Nonfarm wage and salary employment	2.1	2.3	1.8	1.3
Unemployed	2.7	-1.0	1.0	1.2
GNP per employee, 1982 dollars . . . . .	.5	.8	.8	1.0
Disposable income, 1982 dollars	2.5	2.7	2.5	2.2
Disposable income per capita, 1982 dollars	1.4	1.7	1.4	1.5

ate projections of the U.S. economy.² A relatively small number of these assumptions significantly affect the long-term projections of employment and major demand categories of GNP.³ The assumptions are summarized in table 1.

In addition, the projections are generally prepared with selected variables which are much more carefully evaluated, such as the level of the unemployment rate, the rate of growth of labor productivity, the inflation rate, and the presence and severity of business cycle fluctuations. These “target” variables assist BLS in defining the important parameters for which alternatives are developed, but in no sense should they be considered as fixed. Rather, the preliminary target values provide a test of reasonableness against which the overall projection results may be compared.

Major target assumptions were made regarding business cycle fluctuations in the 1990’s. Critical reviews of past projection efforts in which trend growth was imposed on the future have indicated that certain sectors of the economy, notably durable goods consumption and investment in equipment and structures, are overstated when no cycle is present. Consequently, in order to improve the accuracy of the projections, two recessions were assumed during the 1990–2005 period in addition to the 1990–91 downturn. It is important that this assumption not be read as a prediction of recessions in any specific years. Rather, it is a bow to the seeming inevitability of business cycle fluctuations and the impact these fluctuations have on the distribution and levels of demand GNP

components. Nonetheless, it is important to note that neither a downturn nor a recovery period is projected for the year 2005. The year 2005 represents, in the view of BLS, a year on the long-term trend growth path for GNP. In addition to slightly differing results for the distribution of GNP, the assumption of recessions slightly lowers the overall rate of growth of GNP from what would have been projected in a straight trend-growth scenario.

Another major target assumption used in developing the projections was the general trend for the unemployment rate. In a business cycle, the percent of the labor force out of work can be expected to rise dramatically, and to fall just as dramatically in recovery periods. Nonetheless, a general trend in the underlying unemployment rate should be apparent in any set of projection scenarios. Specifically, in the moderate-growth alternative, the unemployment rate is assumed to tend toward the level attained in 1990, a period following a long, sustained economic recovery and well-controlled inflation. The unemployment rate targets are 4.0 percent in the high-growth scenario, 7.0 percent in the low-growth scenario, and 5.5 percent in the moderate-growth alternative.

Assumptions of moderate growth

Many assumptions must be spelled out in very specific terms in order for an economic model to generate estimates of future growth paths. Many of these assumptions, although important to specific parts of the model and its results, have very little impact on those components of the projections used in subsequent stages of the BLS projection process. The following discussion focuses on those assumptions which have the greatest impact on GNP, and on employment and productivity.

Fiscal policy. Following the Viet Nam War, real defense purchases declined steadily, reaching a low point at \$158 billion in 1976. Between 1976 and 1987, there was a resurgence of spending on defense preparedness. Real defense purchases of goods and services grew at an annual rate of 4.8 percent. A large proportion of this growth was attributable to efforts to modernize and expand U.S. Armed Forces capabilities, and included expenditures on such programs as the expansion of the Navy to a 600-ship fleet, the development of the B-1 bomber, increased air wing size, and more advanced rolling stock, such as new tanks and troop carriers. More

Table 1. Major assumptions affecting aggregate projections, 1975, 1990, and projected to 2005

Category	1975	1990	2005			1975-90	Average annual rates of change		
			Low	Moderate	High		1990-2005		
							Low	Moderate	High
Total population	216.1	251.4	275.6	281.6	281.6	1.0	.6	.8	.8
Population age 0-5	16.1	18.5	16.6	17.2	17.2	.9	-.7	-.5	-.5
Male population age 25-54	38.3	53.5	59.4	60.8	60.8	2.3	.7	.9	.9
Population age 16 and over	157.3	193.6	219.3	223.6	223.6	1.4	.8	1.0	1.0
Population age 16-19	17.0	14.1	15.6	16.0	16.0	-1.2	.7	.8	.8
Population age 22 and over	132.1	171.9	196.0	199.7	199.7	1.8	.9	1.0	1.0
Population age 65 and over	22.7	31.6	36.2	36.4	36.4	2.2	.9	.9	.9
Civilian labor force	93.8	124.8	141.8	150.8	156.2	1.9	.9	1.3	1.5
Trend household formation	71.7	93.2	101.2	105.0	105.0	1.8	.6	.8	.8
Defense purchases, 1982 dollars	\$161.1	\$259.1	\$198.3	\$216.0	\$222.8	3.2	-1.8	-1.2	-1.0
Nondefense purchases, 1982 dollars	\$65.3	\$84.9	\$104.1	\$113.4	\$120.9	1.8	1.2	1.8	2.2
Grants-in-aid to state and local governments, 1982 dollars	\$93.8	\$88.4	\$95.0	\$105.2	\$106.8	-.4	.5	1.2	1.3
Federal transfers, base level, 1982 dollars	\$232.7	\$357.4	\$503.5	\$515.7	\$578.6	2.9	2.3	2.5	3.3
Federal corporate profits tax rate	0.48	0.34	0.34	0.34	0.34	-2.3	0	0	0
State and local corporate profits tax rate	0.05	0.08	0.09	0.09	0.09	3.2	.8	.8	.8
Federal personal taxes, marginal rate	0.26	0.23	0.24	0.24	0.24	-.8	.3	.3	.3
Social insurance tax rate	0.12	0.16	0.18	0.18	0.18	1.9	.8	.8	.8
State and local indirect business taxes	\$116.2	\$379.9	\$1,097.4	\$1,122.5	\$1,175.3	8.2	7.3	7.5	7.8
Average miles/gallon, U.S. auto fleet	14.2	23.5	28.7	28.7	28.7	3.4	1.3	1.3	1.3
Interstate highway miles	36,969	42,493	42,574	42,574	42,574	.9	0	0	0
Federal gasoline tax	4.00	10.14	19.00	19.00	19.00	6.4	4.3	4.3	4.3
State and local gasoline tax	7.61	15.01	35.70	35.70	35.70	4.6	5.9	5.9	5.9
Required reserve ratio, demand and time deposits	1.53	1.05	1.00	1.03	1.06	-2.5	-.3	-.1	.1
Nonborrowed reserves	26.7	59.7	143.4	139.8	136.0	5.5	6.0	5.8	5.6

SOURCE: Historical data are from the Bureau of Economic Analysis and Bureau of the Census, U.S. Department of Commerce; projected data are from the Bureau of Labor Statistics.

recently, increased pressure to trim the budget deficit has resulted in a \$6 billion cut in real defense spending between 1987 and 1990. A continued contraction in defense spending is assumed throughout the coming decade, with *real* spending on military goods and services dropping at an average annual rate of 1.2 percent between 1990 and 2005.

Federal spending on nondefense purchases of goods and services grew at a real rate of 1.8 percent a year between 1975 and 1990. As a result, such spending declined as a share of GNP, from 2.4 percent in 1975 to just 2.0 percent in 1990—a post-World War II historical low. Many domestic Federal programs declined during this period. Recently, growing pressure has been placed on the Federal Government to give firmer commitment to some of these programs. Thus, real nondefense spending is expected to strengthen somewhat during the coming decade, growing at 1.9 percent each year between 1990 and 2005. It should be noted that this is still a slower rate of growth than that projected for overall GNP. Thus, the decline in nondefense spending as a share of GNP is not reversed by this assumption.

Federal transfer payments to persons are determined in the projections as a function of general economic conditions and a basic background level of transfers, that is, the real level of transfer payments that would be expected during periods of sustained high employment. This background level is projected to grow at a real rate of 2.5 percent a year between 1990 and 2005, down slightly from the 2.9 percent growth during the preceding 15 years.

Real grants-in-aid to State and local governments have been cut relatively sharply during the 1970's and the first half of the 1980's, primarily in the area of Federal revenue sharing grants, but also in many of the earmarked grant programs. The continued deterioration of our interstate highway system, however, has stimulated some fairly sharp increases in this category of grant spending during the past few years. Between 1980 and 1985, for example, real grants declined at an average annual rate of 3.4 percent. Between 1985 and 1990, however, real grants-in-aid increased, at a rate of 1.3 percent each year. From 1990 to 2005, grants-in-aid are assumed to grow at a real average annual rate of 1.2 percent, up markedly from the 0.4-percent average annual declines between 1975 and 1990, a reflection primarily of the continuing effort to repair and modernize our highways and bridges.

On the revenue side, most tax rates are specified exogenously as statutory rates or average marginal rates. The relevant effective rates for taxes on corporations and personal income are

then derived from the mandated rates, general business conditions, progressivity, surcharges, tax credits, and other tax law changes. It has been assumed that no major changes will affect the currently mandated tax rates for corporations, persons, or for social insurance and indirect business taxes.

Monetary policy. The monetary sector of the economic model has been designed to determine the rate of growth of the money supply commensurate with long-term stable growth and the determination of interest rates consistent with steady growth and controlled inflation. In short-run models, the monetary authority wields much more power in determining the growth of the economy than is the case in the long-term formulation. There are only two critical monetary assumptions which need to be specified for the moderate-growth projection—the required reserve ratio on demand and time deposits and the nonborrowed reserves of member banks. Both are assumed to be set in a way best described as accommodative, maintaining a roughly constant rate of growth of velocity and stable interest rates.

Demographic. The population estimates underlying the moderate and high growth projections are the high-migration scenario developed by the Bureau of the Census.⁴ The Census Bureau's middle scenario population underlies the low-growth projections. The high-migration civilian labor force projections, developed by BLS to be consistent with the Census Bureau population projections, are incorporated in the moderate-growth scenario in place of labor force estimates derived in the long-term model.⁵ The only other major demographic assumption is the new household formation rate, derived from earlier Census Bureau projections, modified by BLS to reflect the later population data.

Energy. The demand for energy is determined in the model by general economic activity levels and the price of energy relative to other goods. That supply is adequate to meet demand is assumed. Domestic production of petroleum and natural gas is determined exogenously and specified as that percent of total petroleum and natural gas consumption produced domestically. The balance of the petroleum and natural gas necessary to meet our demand level is imported. The average import price of crude petroleum is determined within the model. Imported oil, on a BTU-content basis, is assumed to account for just over 40 percent of domestic needs by 2005, up sharply from the 24-percent share of demand accounted for by imports in 1990, but consistent with pro-

jections developed within the Department of Energy.⁶

General assumptions. It was further assumed that there would be no major wars, oil embargoes, other major price shocks, or serious natural catastrophes during the projection period.

Moderate-growth projections

As noted earlier, real GNP is expected to grow at an average annual rate of 2.3 percent between 1990 and 2005 in the moderate-growth projections. This compares to the rate of growth of 2.9 percent annually during the previous 15-year period, 1975–90. To understand why the GNP is expected to slow so markedly in the future, one must examine the behavior of the major factors of production—labor and capital. The supply of labor, as represented by the civilian labor force, will slow to a 1.3-percent rate of growth over the 1990–2005 period, down 0.6 percentage points from the 1975–90 growth rate of 1.9 percent. As population growth slows, so too will labor force growth, in spite of higher immigration assumptions. Offsetting this to some extent is a higher utilization rate for labor and a slight improvement in GNP per employee, estimated to increase at an annual rate of 1.0 percent between 1990 and 2005, up from the 0.8-percent growth experienced during the 1975–90 period.

It should be noted that the 1975–90 period has been chosen to provide a comparison between a 15-year historical period and a 15-year projection period. There is no single period which well describes all of the economic phenomenon occurring during the past 15 years. As a result, this article often refers to relevant historical subperiods that are more meaningful. (See box, page 14, for an examination of some of the drawbacks to using the 1975–90 period for analytical purposes.)

In spite of the more moderate projection for growth, we are looking at an economy which shows long-term improvements, in that several of the economic ills which have been with us show improvement—the Federal budget deficit is improved, the U.S. improves its trading position in world markets, and employment growth remains steady. The following examines the moderate-growth projections in more detail.

Personal consumption expenditures. Personal consumption expenditures have traditionally accounted for the largest share of GNP. Between 1958 and 1974, such expenditures, in constant prices, have averaged 60 percent of final purchases. Beginning in 1975, however, a major structural shift in the U.S. economy appears to have taken place. From that year to 1990, per-

sonal consumption has averaged 64 percent of GNP, with the peak year in 1986, when personal consumption expenditures accounted for almost 66 percent of total final sales.

The increasing share of GNP accounted for by consumption appears, for the most part, to have been at the expense of gross savings. The personal savings rate began a long, slow slide in the mid-1970's, declining from an average of 8 percent for the 1970's to an average of just 5.3 percent during the 1980's. Further, the personal savings rate averaged only 4 percent over the 1985–89 period.

Accompanying the declining rate of personal savings was a Federal budget deficit⁷ (an important, albeit negative, component of gross savings) which grew from \$12 billion in 1974 to a peak of \$207 billion in 1986, lowering the gross savings rate from almost 15 percent in 1975 to 13.3 percent in 1985 and further to just 12 percent of nominal GNP by 1990. The impact of these structural shifts in the gross savings rate, a key factor in the determination of funds available for investment growth in our economy, will be more fully covered in the discussion of investment spending. Suffice it to say, though, that the result has been a personal consumer spending surge focused on durable goods—notably autos and consumer electronics—and on a vast array of consumer services—primarily medical, but also with considerable growth in industries providing sophisticated financial services to consumers.

BLS projections result in very little expected change in the share of GNP accounted for by personal spending. As noted, however, this clearly reverses the long-run historical trend. In 2005, the moderate growth projections show personal consumption expenditures accounting for 64.3 percent of GNP, virtually unchanged from the 1990 share of 64.5 percent. (See table 2.) This halting of the upward trend in the personal consumption expenditures share of GNP results primarily from the aging of the baby-boom population, a group which is beginning to anticipate the need for retirement funds. By major product categories, however, some interesting shifts in the composition of personal consumption expenditures are expected. (See table 3.)

Population projections imply a marked slowdown in new entrants to the driving-age population, thus indicating relatively flat new car sales over the entire projection period—rising from 9.9 million units in 1989 to about 10.5 million units in 2005. The aging of the population, however, results in a tendency toward larger, higher-valued cars, on average, thus allowing spending on new cars to slightly outpace overall consumer spending and slightly raising

new cars as a share of personal consumption expenditures, from 6.6 percent in 1990 to 6.7 percent by 2005.

Spending on furniture, other durable goods, and clothing is expected to continue to grow much more rapidly than overall consumption between 1990 and 2005. The major growth component of this spending category is the “other consumer durables” group. This component comprises the burgeoning array of sophisticated electronic devices becoming increasingly available to consumer markets. The revolution in consumer electronics began as a spin-off from space and military research and development programs of the 1970’s and 1980’s, but consumer electronics has now developed as a major research and development effort in its own right as the tremendous potential for the market becomes more greatly appreciated by the electronics industry. In addition, very strong growth in sporting goods and in apparel is expected throughout the projection period.

Consumer energy use—gasoline and motor oil for our automobiles and fuel oil, natural gas, and electricity for heating and air-conditioning our homes—has grown at a relatively slow pace since 1972, a reaction to higher energy costs and a reflection of the economy-wide move toward energy conservation. More efficient automobiles and appliances and better insulated homes have led to declining consumer energy use, from a 10.4-percent share of overall personal consumption expenditures in 1975 to 7.2 percent by 1990. The moderate-growth projections assume that many of these trends will continue, leading to energy use accounting for only 6.1 percent of consumption spending by 2005.

Consumer spending on nondurables generally consists of “subsistence” items, such as

food, cleaning products, cosmetics, and other short-term consumables. As family incomes rise, expenditures on nondurables also rise, up to a point. After that point is reached, spending on these items, at the household level, tends to flatten out. There is, after all, a limit to how many calories one family can consume, be they hamburgers, steak, or tofu. Generally, improving standards of living in the United States have thus led to this component of consumer spending accounting for smaller shares in overall consumption over time. Between 1975 and 1990, for example, nondurables consumption fell from a 28-percent share of personal consumption expenditures to 23.3 percent. This is not to say that spending on these items declined absolutely, but that it simply grew at a significantly slower pace than overall personal consumption expenditures. BLS projections expect the trend to continue as spending on food and other nondurables is projected to increase at a rate of 1.4 percent annually. The share will continue to decline, reaching 20.6 percent by 2005.

The Bureau of the Census population projections imply a noticeable slowdown in new net household formation. This is borne out in the BLS projections of consumer spending for housing. Some offsets to the slowdown are anticipated as consumers purchase new homes with rising average values, but this effect is expected to be relatively small. Thus, the share of consumer spending allocated to housing needs will continue to drop slightly, reaching 13.2 percent of total personal consumption spending by 2005, down from 14.1 percent in 1990.

Spending on consumer services, on the other hand, is expected to proceed at a much more robust rate than overall consumer spending—2.9 percent annual growth between 1990 and

Table 2. **Gross national product by major demand category, 1975, 1990, and projected to 2005**

Category	Billions of 1982 dollars					Percent distribution					Average annual rates of change			
	1975	1990	2005			1975	1990	2005			1975–90	1990–2005		
			Low	Moderate	High			Low	Moderate	High		Low	Moderate	High
Gross national product	\$2,695.0	\$4,155.8	\$5,223.6	\$5,842.6	\$6,365.7	100.0	100.0	100.0	100.0	100.0	2.9	1.5	2.3	2.9
Personal consumption	1,711.9	2,682.2	3,456.9	3,757.3	4,133.9	63.5	64.5	66.2	64.3	64.9	3.0	1.7	2.3	2.9
Investment	383.3	690.3	883.7	1,024.9	1,154.1	14.2	16.6	16.9	17.5	18.1	4.0	1.7	2.7	3.5
Exports	259.7	630.3	1,110.5	1,217.0	1,351.4	9.6	15.2	21.3	20.8	21.2	6.1	3.8	4.5	5.2
Imports	-240.8	-667.8	-1,143.9	-1,156.3	-1,343.1	-8.9	-16.1	-21.9	-19.8	-21.1	7.0	3.7	3.7	4.8
National defense	161.1	259.1	198.3	216.0	222.8	6.0	6.2	3.8	3.7	3.5	3.2	-1.8	-1.2	-1.0
Federal nondefense	65.3	84.9	104.1	113.4	120.9	2.4	2.0	2.0	1.9	1.9	1.8	1.4	1.9	2.4
State and local government	354.6	476.8	614.0	670.3	725.7	13.2	11.5	11.8	11.5	11.4	2.0	1.7	2.3	2.8

SOURCE: Historical data are from the Bureau of Economic Analysis, U.S. Department of Commerce; projected data are from Bureau of Labor Statistics.

Table 3. Personal consumption expenditures by type, 1975, 1990, and projected to 2005

Category	Billions of 1982 dollars					Percent distribution					Average annual rates of change			
	1975	1990	2005			1975	1990	2005			1975-90	1990-2005		
			Low	Moderate	High			Low	Moderate	High		Low	Moderate	High
Personal consumption ..	\$1,711.9	\$2,682.2	\$3,456.9	\$3,757.3	\$4,133.9	100.0	100.0	100.0	100.0	100.0	3.0	1.7	2.3	2.9
Motor vehicles and parts	91.1	177.8	215.2	252.5	292.2	5.3	6.6	6.2	6.7	7.1	4.6	1.3	2.4	3.4
Furniture, clothing, and other durables	202.6	423.3	581.9	655.6	732.0	11.8	15.8	16.8	17.4	17.7	5.0	2.1	3.0	3.7
Fuel oil, gasoline, and natural gas..	140.2	137.7	145.4	152.4	165.5	8.2	5.1	4.2	4.1	4.0	-.1	.4	.7	1.1
Food and other nondurables	474.5	624.9	741.5	774.5	831.7	27.7	23.3	21.4	20.6	20.1	1.9	1.1	1.4	1.9
Housing	265.7	377.1	474.1	496.7	522.0	15.5	14.1	13.7	13.2	12.6	2.4	1.5	1.9	2.2
Electricity	37.0	57.0	72.7	75.7	82.8	2.2	2.1	2.1	2.0	2.0	2.9	1.6	1.9	2.5
Other services	500.8	884.4	1,266.1	1,349.9	1,507.7	29.3	33.0	35.5	35.9	36.5	3.9	2.4	2.9	3.6

SOURCE: Historical data are from the Bureau of Economic Analysis, U.S. Department of Commerce; projected data are from the Bureau of Labor Statistics.

2005. The share of the consumer dollar allocated to services is projected to grow noticeably, reaching almost 36 percent in 2005, up from 29 percent in 1975 and 33 percent in 1990. As the population ages and as medical technology advances, the demand for medical services will continue to grow disproportionately. As previously noted, however, the 1980's have seen major growth in new services such as investment counseling and other professional services and these trends are also expected to continue over the projection horizon. In addition, stronger than average growth is expected for some of the traditional service sectors, such as air travel and all of the recreation categories, such as health clubs and sporting event attendance.

In summary, consumer spending during the 1990-2005 projection period will be healthy, slowing as overall GNP slows, but continuing to account for a major part of expected economic growth. Significant distributional shifts are expected, but, for the most part, there will be continued trends as those exhibited in the 1970's and 1980's.

Gross private domestic investment. Gross private domestic investment (referred to as private investment hereinafter) is comprised of business fixed investment—purchases of nonresidential structures and purchases of producers' durable equipment; construction of residential buildings—and changes in business inventories. Over the historical period, private investment has accounted for a remarkably stable share of GNP—16.5 percent during the 1960's, 17 percent over the 1970's, and 16.8 percent during the 1980's. (See table 4.) This seeming stability in the averages can be deceptive, however.

Business investment—purchases of plant and equipment—has traditionally been the most volatile component of GNP, responding sharply and even wildly at times to swings in the business cycle. Equipment purchases, for example, ranged from a low of 4.7 percent of real GNP in 1961 to a high of 8.1 percent in 1979. Even more noteworthy is the spectacular range in annual growth rates over the post-World War II period, from a low of -12 percent in 1975 to a high of 20.4 percent in 1984. Over the projection period, BLS expects equipment purchases to continue to grow more rapidly than overall GNP, attaining a 10.8-percent share of GNP by 2005. What is notable, however, about producers' durable equipment growth in the 1980's and that growth projected to 2005 is the growing proportion accounted for by computers. Because of the enormous quality increases over the past 10 years in business computing, constant-dollar estimates of this commodity grew at a phenomenal pace during the 1980's. Many analysts of this industry expect this to continue almost unabated throughout the projection period.

Recent improvements in the data used to deflate computer purchases have resulted in very large price declines, a result of better accounting for quality change. For example, an equivalent of computing power which may have cost \$1,000 in 1990 might well have cost as much as \$20,000 early in the decade of the 1980's. Because base-weighted price indexes are used for deflation purposes, the effect is to increase the real value of computers at a much more rapid rate than the other real components of producer's durable equipment. In fact, if the rate of growth of real computer purchases were extrapolated to 2005 at the same rate experienced during the 1980's,

the result would reach a level of computer purchases accounting for a sizeable portion of GNP.

Analyses using current or moving weights indicate that computers, while still accounting for ever larger shares of equipment purchases, are not growing at the rate implied by the use of the base-year-weighted price indexes used for deflation purposes. This pricing/quality phenomenon thus leads to an expected rate of growth in equipment purchases that, at first glance, seem consistent with a much higher rate of growth of labor productivity than is in fact implied by the moderate-growth projections. This is not to say that the computer revolution has not had an impact on productivity. It is simply to note that the constant-dollar share of computers may well overstate the real, productive growth in capital in the U.S. economy.

Equipment spending, excluding computers, grew at an average annual rate of 2.7 percent between 1975 and 1990 and is expected to grow at an average annual rate of 2.2 percent between 1990 and 2005, a considerably lower rate of growth than the projections might initially imply. This is the main reason the high growth of investment over the 1990–2005 period does not result in a renaissance of labor productivity, but instead, in only mild improvements in the outlook for that factor of production.

Over the historical period, nonresidential construction growth has generally been slowing. During the 1960's, this category of investment

accounted for almost 5 percent of GNP. The share fell to 4.1 percent during the 1970's and, further, to 3.8 percent during the 1980's. In spite of this slowing, construction markets are currently glutted with an oversupply of office and commercial buildings. The working off of this glut is expected to span an important part of the next 15 years, and nonresidential construction is predicted to fall even further as a result, to a 2.5-percent share of GNP, by 2005. Most of the slowing can be accounted for by the rapid movement of the U.S. economy over the past two decades to a more service-oriented structure. As more employment is found in service establishments, the industrial buildings component of nonresidential construction has slipped dramatically, leading to the declining shares noted above in spite of the boom in office and commercial buildings seen during the late 1970's and early 1980's.

The market for residential construction had been remarkably stable from 1960–79, accounting for almost 5.5 percent of GNP during that entire period. As the baby-boom generation has aged, however, and moved away from that period of their lives when new households were being formed, the residential share of GNP began to decline, averaging 3.8 percent during the 1980's. Offsetting the slowdown a bit is the wave of children of the baby boom, who will be establishing households over the next 15 years. But this phenomenon is expected to do no more

Table 4. Gross private domestic investment, 1975, 1990, and projected to 2005

Category	Billions of 1982 dollars					Percent distribution					Average annual rates of change			
	1975	1990	2005			1975	1990	2005			1975–90	1990–2005		
			Low	Moderate	High			Low	Moderate	High		Low	Moderate	High
Gross private domestic investment	\$383.3	\$690.3	\$883.7	\$1,024.9	\$1,154.1	100.0	100.0	100.0	100.0	100.0	4.0	1.7	2.7	3.5
Business fixed investment	281.2	513.9	651.3	776.1	872.1	73.4	74.4	73.7	75.7	75.6	4.1	1.6	2.8	3.6
Producers' durable equipment	178.4	392.9	536.3	629.2	699.6	46.5	56.9	60.7	61.4	60.6	5.4	2.1	3.2	3.9
Public utility construction	27.2	20.8	21.5	25.7	31.8	7.1	3.0	2.4	2.5	2.8	-1.8	.2	1.4	2.9
Mining and petroleum construction	19.5	17.0	19.5	23.5	24.8	5.1	2.5	2.2	2.3	2.1	-9	.9	1.3	2.5
Buildings and other construction	56.1	83.2	74.0	97.7	115.9	14.6	12.1	8.4	9.5	10.0	2.7	-8	1.1	2.2
Residential construction	114.9	177.5	203.8	217.8	250.8	30.0	25.7	23.1	21.3	21.7	2.9	.9	1.4	2.3
Change in business inventories	-12.8	-1.1	28.6	31.0	31.2	-3.3	-2	3.2	3.0	2.7	...	...	...	...

SOURCE: Historical data are from the Bureau of Economic Analysis, U.S. Department of Commerce; projected data are from the Bureau of Labor Statistics.

than hold the line as residential construction's share of GNP is projected by BLS to remain flat over the coming period, remaining at the 3.8-percent share range.

In summary, private investment is expected to grow more rapidly than overall GNP during the 1990–2005 period, entirely as a result of strong growth in producers' durable equipment. Much of this apparent strength is attributable to the increasing share of equipment purchases of computers, thus leading BLS to expect a relatively minor impact on labor productivity.

Exports and imports. It is safe to say that U.S. imports and exports of goods and services are the two components of GNP which have gained the most in importance over the past 30 years. In 1960, real gross exports accounted for 5.9 percent of GNP, while real imports tallied a 6.1-percent share. By 1990, relative GNP shares had risen to 14.4 percent for real gross exports and 15.7 percent for real imports. Until the early 1980's, growth for both categories of U.S. foreign trade had proceeded apace, with some years showing small real trade deficits and others, small surpluses. In nominal terms, the U.S. economy had not experienced a trade deficit since 1945.

Between 1980 and 1985, in response to expanding Federal deficits, high interest rates, and declining foreign markets, the exchange value of the U.S. dollar began to increase at an unprecedented rate.⁸

Year	Value of the dollar	Net exports	
		1982 dollars	Current dollars
1980	87.4	\$57.0	\$32.1
1981	103.4	49.4	33.9
1982	116.6	26.3	26.3
1983	125.3	-19.9	-6.1
1984	138.2	-84.0	-58.9
1985	143.0	-104.3	-78.0
1986	112.2	-129.7	-97.4
1987	96.9	-118.5	-114.7
1988	92.7	-75.9	-74.1
1989	98.6	-54.1	-46.1
1990	89.1	-37.5	-38.0

The result was cheaper imports, more expensive exports, and, for the first time since World War II, massive and growing nominal trade deficits. The response from both the public and private sectors to this crisis was heartening to U.S. manufacturers. Serious efforts to curtail Federal deficit growth, combined with a relatively stable and growing domestic economy during much of the 1980's, has resulted in generally lower interest rates and some improvement in the Federal deficit. At the same time, many domestic industries have been working hard to streamline their production processes,

improve the quality of their goods, and to once more develop new markets abroad and to become more competitive in old markets. The restructuring of many of the Eastern Bloc economies in the past several years has also served to open up vast new potential markets to U.S. businesses, at least over the long run.

During the latter half of the 1980's, all categories of real exports grew at dramatic rates. Capital goods exports, which had declined 0.2 percent a year between 1980 and 1985, grew more than 18 percent each year, in real terms, between 1985 and 1990. This category was followed by real consumer goods exports, which grew 10.4 percent each year, on average, over the latter half of the 1980's. Foods, feeds, and beverages exports and services exports both improved their growth to more than 8 percent a year, in real terms, during the latter 1980's, following sharp annual declines between 1980 and 1985 for these exports.

Import growth, on the other hand, slowed sharply for most categories during the last half of the decade. Consumer goods imports increased 4.3 percent on average between 1985 and 1990, a healthy rate of growth until compared with its 16.2-percent growth rate during the 1980–85 period. Automotive imports grew by only 1.1 percent a year over this latter 1980's period, following almost 19 percent annual growth between 1980 and 1985.

The result, as can be seen in the text tabulation, has been a major improvement in both the exchange rate and in U.S. trade balances. Problems still exist, however. During the 1980's, the U.S. economy saw huge increases in foreign ownership of domestic industries. U.S. direct investment abroad grew from \$208 billion in 1982 to \$373 billion by 1989, an average annual rate of growth of 8.7 percent. During the same period, foreign direct investment in the United States grew from \$125 billion to \$400 billion, more than 18 percent annual growth. The flow of income out of the United States due to these investments will continue to be a weakening factor in U.S. foreign trade positions for the foreseeable future.

Nonetheless, BLS projections for foreign trade are not bleak. The largest drops in the value of the dollar appear to be behind us, but the exchange rate is expected to continue to improve at a moderate pace, reaching a level of 74.9 by 2005, down from 89.1 in 1990—an average annual decline of 1.1 percent. The exchange rate in the macroeconomic model is affected primarily by the real non-oil trade balance relative to overall exports and secondarily by relative wholesale prices and relative bond rates. As exports grow and trade balances improve as a result of,

among other things, declining exchange rates, the impact is to further move the exchange rate in a downward direction. The real net balance on goods and services is predicted to continue to improve, coming into balance sometime during the mid-1990's, and attaining a net positive level of \$61 billion by 2005.

By end-use category, the major areas of growth in exports are predicted for capital goods and consumer goods; both are expected to increase their share of gross exports by significant amounts in the next 15 years. (See table 5.) Import growth is expected to moderate sharply, with major dropoffs in foods, feeds, and beverages; capital goods; and consumer goods. The strong growth in imports of services, from a 15.6-percent share of gross imports in 1990 to a 16.7-percent slice by 2005, reflects, primarily, expected growth in factor income—the return on foreign investment in the United States.

In summary, the improvement in the U.S. foreign trade position seen during the latter half of the 1980's is expected to continue. It should be noted, however, that this is perhaps one of the least understood areas of the projections and the

area subject to the greatest uncertainty. For that reason, significant spreads in foreign trade behavior are examined more closely in the alternative projections presented later in this article.

Federal Government. The Federal Government budget has been dominated over the past decade by one consideration: how to bring the growing deficit under control. The deficit grew from \$16.1 billion in 1979 to \$207 billion in 1987. Over this period, effective personal tax rates declined from 13.4 percent to 12.6 percent, while various expenditure categories continued to grow.

Expenditures on military research and development and on the acquisition of more sophisticated weapons systems raised the nominal defense share of Federal expenditures from 23.3 percent in 1979 to 27.5 percent by 1987. As the deficit expanded rapidly, this pushed net interest payments from an 8.2-percent to a 13.3-percent share of Federal expenditures during the same period. Losing ground as a share of Federal Government expenditures over the 1979–87 period were transfer programs (from 40.4 percent to 38.6 percent of expenditures), grants-in-aid to

Table 5. Exports and imports of goods and services, 1975, 1990, and projected to 2005

Category	Billions of 1982 dollars					Percent distribution					Average annual rates of change			
	1975	1990	2005			1975	1990	2005			1975–90	1990–2005		
			Low	Moderate	High			Low	Moderate	High		Low	Moderate	High
Exports of goods and services . . .	\$259.7	\$630.3	\$1,110.5	\$1,217.0	\$1,351.4	100.0	100.0	100.0	100.0	100.0	6.1	3.8	4.5	5.2
Foods, feeds and beverages	20.1	37.8	47.7	51.5	58.6	7.7	6.0	4.3	4.2	4.3	4.3	1.6	2.1	3.0
Industrial supplies and materials . . .	43.7	96.0	155.5	158.2	184.6	16.8	15.4	14.0	13.0	13.7	5.4	3.3	3.4	4.5
Capital goods	62.7	199.7	423.3	478.6	528.3	24.1	31.7	38.1	39.3	39.1	8.0	5.1	6.0	6.7
Automobiles and parts	23.4	30.7	39.9	46.1	50.9	9.0	4.9	3.6	3.8	3.8	1.8	1.8	2.7	3.4
Consumer and other goods	21.8	60.2	122.3	137.3	152.8	8.4	9.6	11.0	11.3	11.3	7.0	4.8	5.7	6.4
Services	88.1	205.9	321.8	345.3	376.2	33.9	32.4	29.0	28.4	27.8	5.8	3.0	3.5	4.1
Imports of goods and services . . .	240.8	667.8	1,143.9	1,156.3	1,343.1	100.0	100.0	100.0	100.0	100.0	7.0	3.7	3.7	4.8
Foods, feeds and beverages	14.6	25.2	26.8	27.7	31.8	6.1	3.8	2.3	2.4	2.4	3.7	.4	.6	1.6
Industrial supplies and materials . . .	38.3	73.5	101.9	105.2	114.6	15.9	11.0	8.9	9.2	8.5	4.4	2.2	2.4	3.0
Petroleum	75.2	95.1	144.8	150.2	177.3	31.2	14.3	12.7	13.1	13.2	1.6	2.8	3.1	4.2
Capital goods	38.3	156.6	278.8	283.5	331.0	15.9	23.6	24.4	24.8	24.6	9.8	3.9	4.0	5.1
Automobiles and parts	23.1	64.2	80.1	88.8	108.2	9.6	9.6	7.0	7.8	8.1	7.1	1.5	2.2	3.5
Consumer and other goods	23.1	103.9	203.7	190.5	231.9	9.6	15.6	17.8	16.7	17.3	10.5	4.6	4.1	5.5
Services	52.9	149.3	307.8	310.4	348.3	22.0	22.1	26.9	27.1	25.9	7.2	4.9	5.0	5.8
Net foreign trade	18.8	-37.5	-33.4	60.7	8.3	...	...	...	...	...	...	...	...	...

SOURCE: Historical data are from the Bureau of Economic Analysis, U.S. Department of Commerce; projected data are from the Bureau of Labor Statistics.

Table 6. Federal government receipts and expenditures, 1975, 1990, and projected to 2005

Category	Billions of 1982 dollars					Percent distribution					Average annual rates of change			
	1975	1990	2005			1975	1990	2005			1975-90	1990-2005		
			Low	Moderate	High			Low	Moderate	High		Low	Moderate	High
Receipts	\$294.9	\$1,111.7	\$2,805.9	\$3,109.1	\$3,743.2	100.0	100.0	100.0	100.0	100.0	9.2	6.4	7.1	8.4
Personal taxes	125.9	493.2	1,130.6	1,340.1	1,797.1	42.7	44.4	40.3	43.1	48.0	9.5	5.7	6.9	9.0
Corporate profits taxes	43.6	110.1	209.5	251.8	283.6	14.8	9.9	7.5	8.1	7.6	6.4	4.4	5.7	6.5
Indirect business taxes	23.8	61.7	160.2	176.4	212.5	8.1	5.6	5.7	5.7	5.7	6.6	6.6	7.3	8.6
Social insurance contributions	101.6	446.7	1,305.6	1,340.8	1,450.0	34.5	40.2	46.5	43.1	38.7	10.4	7.4	7.6	8.2
Expenditures	364.2	1,273.0	2,981.1	3,168.3	3,795.7	100.0	100.0	100.0	100.0	100.0	8.7	5.8	6.3	7.6
Purchases of goods and services	129.2	424.2	787.4	938.1	974.4	35.5	33.3	26.4	29.6	25.7	8.2	4.2	5.4	5.7
Transfer payments	150.8	509.1	1,482.4	1,458.3	1,961.2	41.4	40.0	49.7	46.0	51.7	8.4	7.4	7.3	9.4
Grants-in-aid to State and local governments	54.6	130.6	351.4	432.6	501.1	15.0	10.3	11.8	13.7	13.2	6.0	6.8	8.3	9.4
Net interest paid	23.0	186.3	301.2	275.2	283.8	6.3	14.6	10.1	8.7	7.5	15.0	3.3	2.6	2.8
Subsidies less current surplus	6.9	22.8	58.7	64.1	75.2	1.9	1.8	2.0	2.0	2.0	8.3	6.5	7.1	8.3
Federal surplus	-69.4	-161.3	-175.2	-59.2	52.5	...	...	...	...	...	...	...	...	...

SOURCE: Historical data are from the Bureau of Economic Analysis, U.S. Department of Commerce; projected data are from the Bureau of Labor Statistics.

State and local governments (from 15.4 percent to 9.6 percent), and purchases of nondefense goods and services (from 10.8 to 8.1 percent).

Stringent cost-cutting measures, along with some minor tax increases, have served, by 1990, to gain some control over the Federal budget, lowering it to \$161 billion in that year. Although Operation Desert Storm will likely have the short-term effect of raising the deficit again in 1991, BLS projects that a major restructuring of government spending is likely, which, combined with relatively stable tax rates, is expected to improve the deficit picture by 2005. (See table 6.)

Considering huge deficits of the mid-1980's followed by startling worldwide political developments, BLS has assumed that between 1990 and 2000, real defense spending in the U.S. will decline 2.2 percent each year, dropping from \$259 billion in 1990 to \$207 billion by 2000 in 1982 dollars.⁹ Thereafter, it is assumed that some resumption of real defense spending growth will occur (an average annual rate of increase of 0.8 percent), leaving defense purchases at \$216 billion in 2005. In nominal terms, this results in an increase in defense spending of \$224 billion over the 1990-2005 period, compared with a like increase of \$224 billion in the prior 15-year period, 1975-90, and represents a defense share of Federal expenditures cut to 17.4 percent in 2005, down from 24.9 percent in 1990.

It is further assumed that both transfer programs and grants-in-aid will increase their share

of Federal spending by 2005. Real transfers per recipient have been assumed constant over the projection period. The increasing share of transfers (from 39 percent in 1990 to 52 percent by 2005) is explained entirely by rising client populations, notably in the older age groups seeking enhanced medical programs. Grants-in-aid are expected to rise not only as a share of expenditures (from 10 percent in 1990 to 13 percent by 2005), but also in real terms, in response to a growing concern that infrastructure improvement and repair can no longer be postponed.

The result of these assumptions is that the Federal deficit, which amounted to 3.6 percent of nominal GNP in 1987, will decline to \$31 billion by 1999—a 0.3-percent share of GNP—and remain roughly at that level for the remainder of the projection period. On the revenue side of the accounts, it has been assumed that effective tax rates will decline very moderately over the period. Constant tax rates or mild increases could, therefore, result in significantly different estimates of the Federal deficit (or surplus).

State and local government. Real purchases of goods and services by State and local governments steadily increased their share of GNP throughout the 1960's and early 1970's, peaking at 13.2 percent of GNP in 1975, up from an 11-percent share in 1960. An important part of the increase was funded by increasing grants-in-aid from the Federal Government—both in ear-

Table 7. State and local government receipts and expenditures, 1975, 1990, and projected to 2005

Category	Billions of current dollars					Percent distribution					Average annual rates of change			
	1975	1990	2005			1975	1990	2005			1975–90	1990–2005		
			Low	Moderate	High			Low	Moderate	High		Low	Moderate	High
Receipts	\$239.6	\$800.1	\$2,187.6	\$2,469.8	\$2,893.5	100.0	100.0	100.0	100.0	100.0	8.4	6.9	7.8	8.9
Personal taxes	44.7	206.6	570.1	675.7	906.5	18.7	25.8	26.1	27.4	31.3	10.7	7.0	8.2	10.4
Corporate profits taxes	7.3	24.0	35.9	47.8	62.5	3.0	3.0	1.6	1.9	2.2	8.3	2.7	4.7	6.6
Indirect business taxes	116.2	378.7	1,097.4	1,122.5	1,175.3	48.5	47.3	50.2	45.4	40.6	8.2	7.4	7.5	7.8
Social insurance contributions	16.8	60.2	132.8	191.2	248.1	7.0	7.5	6.1	7.7	8.6	8.9	5.4	8.0	9.9
Grants-in-aid from Federal government	54.6	130.6	351.4	432.6	501.1	22.8	16.3	16.1	17.5	17.3	6.0	6.8	8.3	9.4
Expenditures	235.2	764.7	1,932.5	2,308.0	2,716.8	100.0	100.0	100.0	100.0	100.0	8.2	6.4	7.6	8.8
Purchases of goods and services	205.9	673.8	1,652.2	2,025.0	2,375.2	87.5	88.1	85.5	87.7	87.4	8.2	5.3	7.6	8.8
Transfer payments	38.9	162.9	414.0	429.5	456.2	16.5	21.3	21.4	18.6	16.8	10.0	6.4	6.7	7.1
Net interest paid	-5.1	-51.7	-78.5	-60.7	-56.2	-2.2	-6.8	-4.1	-2.6	-2.1	7.8	2.8	1.1	0.6
Subsidies less current surplus	-4.5	-20.3	-55.2	-56.1	-58.4	-1.9	-2.7	-2.9	-2.4	-2.1	2.4	6.9	7.0	7.3
State and local surplus	4.5	35.4	255.1	161.8	176.7	...	...	...	...	...	...	...	...	...

SOURCE: Historical data are from the Bureau of Economic Analysis, U.S. Department of Commerce; projected data are from the Bureau of Labor Statistics.

marked funds, such as the Federal Highway Trust Fund, and in nonallocated monies from the general revenue sharing program begun during the Nixon Administration.

From 1975 through the early 1980's, the general revenue sharing program was phased out. The belief that the interstate highway system was "finished" led to further slowdowns in Federal grants. As a result, State and local purchases of goods and services again receded to a share of GNP of 11.4 percent by 1990, very close to the 1960 share.

During the 1980's, many State and local programs were cut, sometimes sharply, in response to general taxpayer dissatisfaction and to the needs of fiscal integrity. Offsetting the cuts, to some extent, was a resumption in growth of Federal Highway Trust Fund monies, as it became apparent that even if the interstate highway system were complete, some significant maintenance and repair expenditures would be required to keep it in working order.¹⁰

Both trends are expected to continue into the future. Fiscal belt-tightening will remain a fact of life for State and local governments throughout the next 15 years, especially with regard to social programs. This will be necessary in order to maintain balanced budgets in the face of increasing needs for public safety expenditures and incarceration facilities. BLS has further assumed that real grants-in-aid will grow at a rate

of 1.3 percent over the next 15 years in response to infrastructure maintenance needs. As a result, State and local spending on goods and services are projected to maintain a constant share of GNP over the 15-year projection period—11.5 percent, in real terms, in 2005. (See table 7.)

Income, employment, and productivity. Between 1975 and 1990, there was a shift away from labor income toward interest and dividend income. (See table 8.) Interest and dividends in 1990 accounted for 14.8 percent of personal income, up from 9.5 percent in 1975, while labor income fell from a 55.1-percent share in 1975 to a 54.2-percent share in 1990. The implication is that there was a relative shift in income growth. Families with high incomes (those most readily able to afford investment portfolios) appear to have gained income relative to moderate- and low-income earners during the same period of time. The BLS projections imply a reversal of this trend in income disparity over the next 15 years as labor-type income shares return to their 1975 values by 2005.

Per capita disposable income is projected to increase at an average annual rate of 6.2 percent, reaching a level of almost \$39,000 by 2005—an increase of \$23,000 from 1990. In real terms, this translates to a 2.2-percent growth each year over the projection horizon, very close to the projected GNP growth of 2.3 percent annually. In

short, BLS expects the moderate-growth projections to be characterized by moderate increases in the real standard of living.

Although the unemployment rate will fluctuate over the next 15 years as business cycles overtake the economy, the expectation in the moderate-growth projection is that the unemployed will continue to account, on average, for a roughly constant share of the labor force. (See table 9.) This yields employment growth of 1.3 percent each year over the 1990–2005 period, an increase of 26 million employed persons. On average, this implies that 1.73 million new jobs will open up in the economy each year over the coming decade and a half.

As noted earlier, real GNP is expected to grow by 2.3 percent each year between 1990 and 2005. How can we account for this growth? In the simplest possible accounting scheme, the supply of labor, as represented by the civilian labor force, is projected to increase at a 1.3-percent annual rate, which leaves exactly 1.0 percent of the expected GNP growth remaining to be accounted for by other factors, such as changes in labor quality, changes in the quantity and quality of available capital, and changes in labor and capital utilization rates, all of which conveniently fall under the rubric of “labor productivity.” In fact, real GNP per employee, a very rough proxy for labor productivity, is expected to grow

Table 8. Gross national product as income, 1975, 1990, and projected to 2005

Category	Billions of current dollars					Percent distribution					Average annual rates of change			
	1975	1990	2005			1975	1990	2005			1975–90	1990–2005		
			Low	Moderate	High			Low	Moderate	High		Low	Moderate	High
Gross national product	\$1,598.4	\$5,463.0	\$12,547.5	\$14,792.0	\$17,429.6	100.0	100.0	100.0	100.0	100.0	8.5	5.7	6.9	8.0
Net national product	1,436.6	4,887.4	10,911.9	13,451.3	15,793.9	89.9	89.5	87.0	90.9	90.6	8.5	5.5	7.0	8.1
National income	1,289.1	4,417.5	9,524.8	12,064.3	14,406.9	80.6	80.9	75.9	81.6	82.7	8.6	5.3	6.9	8.2
Personal income	1,313.4	4,645.6	11,345.7	12,910.1	15,349.9	82.2	85.0	90.4	87.3	88.1	8.8	6.1	7.1	8.3
Wages and salaries	814.7	2,705.3	6,769.7	7,542.6	9,490.0	51.0	49.5	54.0	51.0	54.4	8.3	6.3	7.1	8.7
Other labor income	65.9	258.1	479.2	694.3	823.2	4.1	4.7	3.8	4.7	4.7	9.5	4.2	6.8	8.0
Proprietors' income	125.4	402.4	972.6	1,202.7	1,302.7	7.8	7.4	7.8	8.1	7.5	8.1	6.1	7.6	8.1
Rental income	13.5	6.7	17.2	19.2	21.3	.8	.1	.1	.1	.1	-4.6	6.5	7.3	8.0
Personal dividend income	28.7	123.8	279.5	355.2	402.2	1.8	2.3	2.2	2.4	2.3	10.2	5.6	7.3	8.2
Personal interest income	122.5	680.9	1,685.8	1,844.8	1,962.1	7.7	12.5	13.4	12.5	11.3	12.1	6.2	6.9	7.3
Net transfer payments	142.7	468.4	1,141.7	1,251.3	1,348.4	8.9	8.6	9.1	8.5	7.7	8.2	6.1	6.8	7.3
Disposable personal income	1,142.8	3,945.8	9,645.0	10,894.3	12,645.7	71.5	72.2	76.9	73.6	72.6	8.6	6.1	7.0	8.1
Personal consumption	1,012.8	3,658.1	8,920.1	10,158.0	11,802.3	63.4	67.0	71.1	68.7	67.7	8.9	6.1	7.0	8.1
Interest and transfer payments	25.3	108.7	263.0	267.5	274.3	1.6	2.0	2.1	1.8	1.6	10.2	6.1	6.2	8.0
Personal savings	104.7	179.1	461.9	468.8	569.1	6.6	3.3	3.7	3.2	3.3	3.6	6.5	6.6	8.0
Disposable personal income (billions of 1982 dollars)	1,931.6	2,893.3	3,723.4	4,029.6	4,573.5	...	...	...	...	...	2.7	1.7	2.2	3.1
Per capita disposable personal income (1982 dollars)	8,900	11,500	13,500	14,300	16,200	...	...	...	...	...	1.7	1.1	1.5	2.3
Per capita disposable personal income (current dollars)	5,300	15,700	35,000	38,700	44,800	...	...	...	...	...	7.5	5.5	6.2	7.2
Personal savings rate (percent)	9.2	4.5	4.8	4.3	4.5	...	...	...	...	...	...	...	...	...

SOURCE: Historical data are from the Bureau of Economic Analysis, U.S. Department of Commerce; projected data are from the Bureau of Labor Statistics.

by 1.0 percent a year over the projection period—a small but noticeable improvement over the GNP per employee growth during the 1975–90 period.¹¹

We also noted earlier a shift toward investment during the projection period. In fact, this increasing share of current spending on capital goods is enough to generate a growth in real capital per employee of 0.8 percent annually, slightly lower than the growth in this factor noted during the prior 15-year period. The implication seems clear—productivity growth is expected to improve somewhat not because of any boom in capital spending, but rather, because of an increase in quality—either the quality of available labor, the quality of available capital, or some mix of both factors.

Alternative projections

As stated earlier, users should keep in mind that economic and employment projections are filled with uncertainty. GNP and employment growth are determined by many factors—all of which are subject to a wide range of values. The following discussion of the low- and high-growth scenarios attempts to address the uncertainty.

As with the moderate-growth projections, a number of assumptions must be spelled out in order to generate alternative low- and high-growth paths. Some of the more than 200 exogenous variables necessary to generate a solution from the macroeconomic model are especially important in the determination of the level of GNP, the demand distribution of GNP, and the level of employment required to produce GNP. Following are the most important assumptions underlying the low- and high-growth alternative scenarios. (See table 1.)

Fiscal policy. In the low-growth alternative, real defense purchases of goods and services are

assumed to decline over the entire projection period to \$198 billion, an average annual rate of decline of 1.8 percent and approximately \$18 billion lower than defense purchases in the moderate-growth alternative. Because the Federal deficit continues to be a chronic presence in the low-growth alternative, any tendency to turn around the annual declines in spending in the 2000–05 period, as was assumed in the moderate-growth version, is absent from this scenario.

In the high-growth alternative, on the other hand, strong economic growth and growing Federal surpluses near the end of the projection period allow for a shorter period of decline in real defense spending and a somewhat more marked turnaround after 2000. Here, the assumption is that defense spending will also decline, in real terms, at an average annual rate of 1.0 percent, resulting in real defense purchases of \$223 billion in 2005, about \$7 billion higher than the moderate-growth projections, but still about \$36 billion lower than in 1990.

In a like manner, nondefense purchases of goods and services in the low-growth scenario are assumed to grow less rapidly than in the moderate-growth case—1.2 percent growth each year, compared with the moderate-growth rate of 1.8 percent—in response to continuing high deficits and the need to gain some control over Federal spending. The fact that there is any real growth at all for this category of Federal spending is related almost entirely to the fact that client populations for many Federal transfer programs are expected to grow more rapidly in response to the more difficult economic conditions anticipated in the low-growth scenario, thus leading to some expansion in administrative needs for these programs.

In the high-growth alternative, growing surpluses are expected to result in a renewed interest in a broad range of federally-funded pro-

Table 9. Labor supply and factors affecting productivity, 1975, 1990, and projected to 2005

Category	1975	1990	2005			Average annual rates of change			
			Low	Moderate	High	1975–1990	1990–2005		
							Low	Moderate	High
Total population (millions)	216.0	251.4	275.6	281.6	281.6	1.0	0.6	0.8	0.8
Military force level	2.1	2.1	1.6	1.7	1.8	0	-1.8	-1.4	-1.0
Civilian labor force	93.8	124.8	141.8	150.8	156.2	1.9	.9	1.3	1.5
Civilian employment	85.8	117.9	131.9	142.5	149.9	2.1	.8	1.3	1.6
Unemployed	7.9	6.9	9.9	8.3	6.2	-1.0	2.4	1.2	-0.7
Civilian unemployment rate (percent)	8.5	5.5	7.0	5.5	4.0	...	...	...	...
GNP per employee (1982 dollars)	\$31.41	\$35.25	\$40.51	\$41.00	\$42.44	.8	.9	1.0	1.2
Capital per employee (1982 dollars)	\$23.61	\$27.38	\$28.59	\$30.92	\$32.40	1.0	.3	.8	1.1

SOURCE: Historical data are from the Bureau of the Census, Bureau of Economic Analysis, and the Bureau of Labor Statistics; projected data are from the Bureau of Labor Statistics.

grams, from the improvement of educational resources to more diverse programs for environmental awareness and improvement. In this scenario, real nondefense purchases of goods and services are assumed to grow at an annual rate of 2.2 percent.

These two sets of assumptions encompass a \$17 billion range in real nondefense purchases in 2005—from \$104 billion in the low-growth version to \$121 billion in the high-growth alternative. In all cases, nondefense purchases account for sharply lower shares of GNP in 2005—3.8 percent for the low-growth version and 3.5 percent for the high-growth—down from the 6.2-percent nondefense share in 1990.

Federal grants-in-aid to State and local governments are also expected to range widely in the alternative projections in 2005, from a real level of \$95 billion in the low-growth to \$107 billion in the high.

The Federal corporate profits tax rate, the marginal Federal personal tax rate, and the combined employer-employee social insurance contribution rate are all assumed to be the same across the three alternatives. Thus, differences noted among the scenarios in Federal revenues are attributable only to the differences in economic activity.

Monetary policy. As in the moderate-growth alternative, monetary policy levers are set in the macroeconomic model to be accommodative to reasonably noninflationary growth. The high-growth alternative encompasses a somewhat less restrictive monetary authority and the low-growth, a somewhat more restrictive one, but in neither case are the differences great enough to account for significant shares of the differences in the real economic growth path or inflation.

Demographic. Both the moderate- and high-growth alternatives are based on the high-migration scenario of the Bureau of the Census. Significantly higher projections of labor force participation rates in the high-growth alternative lead to a civilian labor force of 156.2 million in 2005, 5.4 million higher than in the moderate-growth projection.¹² Lower labor force participation rate projections, combined with the Census Bureau's middle population scenario, lead to a low-growth projection for the civilian labor force of 141.8 million persons—9 million lower than the moderate-growth assumptions of 150.8 million.

The trend of household formation rates, based on the Census Bureau's population projections, is identical between the moderate- and high-growth alternatives—105 million in 2005—but is significantly lower in the low-growth version,

falling to 101.2 million in 2005 in response to the lower population projections assumed.

As noted earlier, assumed unemployment rates range between 4 percent in the high-growth alternative—indicative of a healthy, dynamic economy—and 7 percent in the low-growth version—symptomatic of a more chronically depressed and stagnant economic environment.

The assumed range in the civilian labor force and in the civilian unemployment rate are the primary factors affecting the projected spread in GNP growth rates in the alternatives. Demographic factors in the long-term also have important impacts on the distribution of demand.

Other assumptions. As with the moderate-growth projection, two cyclical troughs have been imposed on the alternatives, falling in the mid-1990's and the early 2000's. In the low-growth projections, the downturns are deep and relatively prolonged—true recessions. The high-growth alternative, on the other hand, is characterized more by growth slowdowns at these two time periods, rather than by real declines in GNP and employment. In both alternatives, the year 2005 should be considered on the long-term growth path—it is neither a downturn year nor the year following the recession trough.

The low-growth projection was designed primarily to provide a look at what the projection period would be like if poorer economic conditions were to persist. Critical assumptions in this scenario include supply factors constraining the economy's ability to expand and below-trend growth in population and the labor force, capital stocks, and productivity. Further, inflation steadily regains momentum in the 1990's and remains above trend for almost all of the projection period. Combined with a presupposition of deeper recessions and relatively sluggish recoveries, this leads to a real GNP approximately \$620 billion lower in 2005 in the low-growth projection than in the moderate-growth projection, with employment lower by more than 10.5 million.

The high-growth projection, in contrast, assumes somewhat stronger growth in labor force participation, a major shift toward the production of investment goods, and a general moderation of inflation. The result is a GNP of \$6.4 trillion in 2005, \$523 billion higher than in the moderate projection. The sustained growth leads to an unemployment rate of 4.0 percent in 2005, implying more than 7 million additional employed persons that year than in the moderate-growth projection.

The two alternatives to the moderate-growth projection encompass a \$1.1 trillion spread in real GNP in 2005—a range of potential annual average growth from 1.5 to 2.9 percent—a dif-

ference of 14.4 million persons in the civilian labor force, and an 8 million difference in the number of employed persons.

Low-growth alternative. In the low-growth projection, the major factors affecting potential GNP growth include: a lower estimate of the population, resulting in slower labor force growth (0.9 percent a year, attaining a level about 9 million fewer persons in 2005 than in the moderate-growth projection); and slower growth in capital per employee (0.3 percent per year, well below the 0.8 percent annual rate in the moderate-growth projection) as a result of investment slowdowns. Another significant factor lending itself to the sluggish economic performance in the low-trend projection is the inflation rate. The implicit GNP deflator is assumed to increase at an average annual rate of 4.7 percent between 1990 and 2005 in the moderate-growth projection, compared with a much higher projected growth rate of 6.2 percent each year in the low-growth scenario, reminiscent of the high-inflation/low-growth phenomenon of the 1970's.

Over the projection period, real consumer spending is projected to grow at an average annual rate of 1.7 percent, compared with 2.3-percent growth in the moderate-growth projection. Higher interest rates and lower income growth result in particularly adverse effects on durable goods spending, with autos and other durables leading the slowdowns. Motor vehicles and parts purchases are projected to grow in real terms at a rate of 1.3 percent a year over the projection period, an almost 50-percent reduction in growth from the moderate projection, and spending on other durable goods is projected to move at a 2.1-percent annual pace, slower than the 3-percent growth in the moderate projection, due to expected cutbacks in purchases of furniture and consumer electronics. Slowdowns in this category are offset slightly by less-than-average slowing in clothing purchases, one of the "subsistence" categories of consumer spending, typically the last expenditure items to be cut in slow economic periods.

Food and other nondurables are projected to grow at an annual average rate of 1.1 percent over the 1990–2005 period, slower than in the moderate-growth projections, but not as slow as that projected for durable goods purchases.

Expenditures on housing and electricity are projected to grow by 1.5 and 1.6 percent over the projection horizon, primarily in response to slower growth in private household formation rates, but also affected to some extent by the overall climate of slower economic growth. Comparatively, these two categories of consumer services grew at rates of 2.4 percent and

2.9 percent between 1975 and 1990, a period which experienced much stronger growth in demand for housing and related services.

Finally, consumer services are projected to increase less rapidly, but to still account for an almost 36 percent share of overall consumption by 2005, up from a 33-percent share in 1990 and continuing a trend exhibited over the entire post World War II period.

In spite of the sharp reduction in growth, however, consumer spending is expected to maintain an even higher share of GNP than it had in the 1980's, increasing from 64.5 percent of GNP in 1990 to 66.2 percent by 2005, thus continuing to exacerbate the problem of low consumer savings and its ultimate effect on investment and productivity growth. Share increases are projected for expenditures on housing, energy, food, and other nondurable items.

The less favorable economic conditions in the low-growth projection severely curtail investment. In this scenario, total investment is expected to grow at a rate of only 1.7 percent per year between 1990 and 2005—less than half the 4.0-percent rate of growth experienced by this component of GNP during the prior 15 years, and considerably lower than the 2.7-percent rate of growth projected in the moderate-growth alternative. Absolute declines are projected for buildings and other nonresidential construction, as lower rates of growth extend the time period necessary to work off the glut of office building construction of the 1980's. This category of nonresidential construction is projected to decline in real terms from just over \$83 billion in 1990 to \$74 billion in 2005, an average annual rate of decline of 0.8 percent and to account for an 8.4-percent share of gross investment, down noticeably from the 12.1-percent share in 1990.

Producers' durable equipment is projected to increase at a rate of only 2.1 percent annually in the low-growth alternative, leading to a projected increase in capital per employee of only 0.3 percent a year over the 1990 to 2005 period. Residential construction is also projected to slow relative to both the historical period and to the moderate-growth projection, but is expected to account for a slightly larger share of gross investment (23.1 percent) than does the moderate-growth alternative (21.3 percent) as the other categories of investment are harder hit by slower economic growth.

In the area of foreign trade, a higher valued dollar in the low-growth projection than in the moderate projection chokes off the growth in exports that was beginning to materialize in the late 1980's. Although all end-use categories of exports are projected to grow slightly less rapidly than in the moderate-growth projections,

foods, feeds, and beverages, industrial supplies and materials, and services are expected to slightly increase their share of overall exports of goods and services relative to the moderate-growth alternative, as capital goods, automobiles and parts, and consumer goods slow more rapidly than overall export growth. This is a typical response to slower growth in foreign economies, caused at least in part by the economic slowdowns in the United States.

Imports, on the other hand, are only slightly lower than the level projected for the moderate-growth scenario, a result of the impact of cheaper prices due to exchange rate problems. Consumer goods imports are actually projected to grow more rapidly than in the moderate-growth projection, as high-demand consumer electronics items, supplied primarily from foreign sources, become cheaper as the value of the dollar rises. The result is a foreign trade real net deficit of \$33 billion in 2005 on the goods and services account.

Slower economic growth leads to much slower growth in Federal revenues, 6.4 percent each year, on average, in the low-growth projections, relative to the projected 7.1-percent growth each year in the moderate-growth projection. Even with assumed offsets from slowdowns in Federal expenditure growth, the Federal budget deficit is projected to remain high over the entire 1990–2005 period, reaching \$175.2 billion in nominal terms in 2005. However, it should be realized that the deficit accounts for only 1.4 percent of nominal GNP in 2005 in this low-growth projection, still down sharply from the 3-percent of nominal GNP accounted for by the deficit in 1990.

All of these factors, resulting from a continuation of many of the economic problems of the 1980's, lead to projected employment growth of only 0.8 percent annually—an increase of fewer than 15 million employed persons between 1990 and 2005, 1 million persons per year, on average. This compares with a projected average growth of 1.6 million employed persons per year in the moderate-growth projection.

High-growth alternative. In the high-growth projection, output growth is spurred by higher labor force participation rates, resulting in labor force growth of 1.5 percent annually between 1990 and 2005. A lower inflation rate in a dynamic, strengthened economy, stemming from both lower energy price increases and a better ability to respond to growing demand pressures, results in much higher capital per employee accumulation—1.1 percent annual growth over the projection period, compared with 0.8 percent average growth in the moderate projection. Consequently, labor productivity is expected to

grow 1.2 percent a year, 50 percent faster than its growth rate between 1975 and 1990.

Personal consumption spending is projected to grow at a more rapid rate—2.9 percent annually over the projection horizon—in the high-growth projection than in the moderate-growth scenario, but the tendency to high consumption seen in the low-growth alternative is not present in the high-growth scenario. Consumer spending accounts for a 64.9-percent share of GNP in 2005—the same as in the moderate-growth projection—as income growth keeps pace with the consumer's desire to spend extra income. Overall, consumption is higher in all categories, but the greatest effect of high income growth is in durable goods, primarily autos and housing. Spending on motor vehicles and parts is expected to increase at an average annual rate of 3.4 percent over the projection period, and to increase its share of total consumption spending to 7.1 percent. As in the moderate-growth projection, an affluent prime-age population will buy more expensive automobiles, thus sharply offsetting any slowdowns due to slower growth in new entrants to the driving age population.

Fuel oil, gasoline, and natural gas, food and other nondurables, and housing are all predicted to account for slightly smaller shares of overall consumption in the high-growth alternative than in the moderate-growth projection, as higher income growth tends to be spent for luxury items rather than for basic subsistence items. Consumer services growth is expected to be 0.7 percentage points more in the high-growth alternative than in the moderate-growth alternative, as past trends are continued.

Investment growth, projected at 3.5 percent a year over the 1990–2005 period, is still short of the 4.0-percent growth in the prior 1975–90 period. However, a larger portion of this growth is focused on equipment spending, whereas much of the growth during the former period was centered on office buildings and other structure-type investments with a smaller potential impact on labor productivity. The strong growth in equipment—3.9 percent each year, almost twice that projected in the low-growth scenario—together with its impact on the productive capital stock, is attributable primarily to the lower inflation, nonexistent Federal deficit, and lower interest rates that prevail in the high-growth projection.

These same factors also have significant impact on exchange rates and the consequent growth in demand for exports. Overall, exports of goods and services are projected to increase at an average annual rate of 5.2 percent, 0.7 percentage points higher than in the moderate-growth projection. Exceeding this average rate

of growth are exports of foods, feeds, and beverages and industrial supplies and materials, as new markets are expected to open in Eastern Europe for these traditional export favorites.

Although domestic demand for imported goods continues at a brisk pace over the projection period, exports still are expected to outpace import growth.

The lower value of the dollar results in sharply higher real export growth in the high-growth scenario. Stronger-than-average growth is projected for exports of capital goods and industrial supplies and materials. Imports continue to grow strongly, buoyed by strong income growth and demand for many products not manufactured in the United States, but this growth is tempered, to a certain extent, by lower exchange rates and the consequent higher prices for imported goods.

The net effect of the high-growth alternative is a projected GNP growth equaling that of the prior 15-year period: 2.9 percent per year from 1990 to 2005, and average annual increases in employed persons of 2.1 million persons per year.

IN SUMMARY, BLS PROJECTIONS for the 1990–2005 period encompass a \$1.1 trillion spread in real GNP, an 18 million person spread in employment, and some sharp differences in potential GNP distribution. Such a wide range of alternative projections are developed to present a variety of potential economic behavior over the coming 15-year period, delineating those areas most subject to uncertainty. BLS does not ascribe levels of probability to any of the alternatives presented in this article. □

Footnotes

¹ Previously published projections to the year 2000 appeared as a series of five articles in the *Monthly Labor Review*, November 1989.

² Periodically, BLS solicits proposals for a macro-econometric model for use in developing the projections. The current aggregate economic projections have been prepared using the Data Resources, Inc. Annual Model of the U.S. Economy, a relatively small-scale model designed to generate long-term macroeconomic policy simulations. See Data Resources, Inc., "The DRI Annual Model of the U.S. Economy," *U.S. Long Term Review*, Winter 1986–87, pp. 30–42.

³ For a detailed description of the analytical methodology used, see Norman C. Saunders, "Sensitivity of the BLS economic projections to exogenous variables," *Monthly Labor Review*, December 1986, pp. 23–29. A like analysis has been carried out for the Data Resources, Inc. Long-term Model, but the results have not been published.

⁴ Projections of the Population of the United States, 1987 to 2080, *Current Population Reports*, Series P–25, No. 1018 (Bureau of the Census, 1989).

⁵ See Howard N. Fullerton, Jr., "Labor force projections: the baby-boom moves on," *Monthly Labor Review*, November 1991, pp. 31–44.

⁶ See *Annual Energy Outlook 1990* (U.S. Department of Energy, 1991). The Department of Energy publishes each year a range of estimates regarding energy supply and demand over the coming 20 years. Scenarios consistent with basic BLS assumptions are chosen and the energy sectors of the Data Resources Inc. model are matched to the Department of Energy results.

⁷ All references to Federal budget deficits in this article refer to the National Income and Product Accounts concept of the deficit, formulated on an annual, calendar-year basis.

⁸ Figures in the value of the dollar column are multilateral trade-weighted indexes of the value of the U.S. dollar, in nominal terms, prepared by the Board of Governors of the Federal Reserve System.

⁹ For a more complete discussion of the impacts of future defense spending cuts on employment by industry and occupation, see Norman C. Saunders, "Defense spending in the 1990's—the effect of deeper cuts," *Monthly Labor Review*, October 1990, pp. 3–15.

¹⁰ For two interesting discussions of the relationship between infrastructure investment and productivity growth, see David Alan Aschauer, "Is Public Expenditure Productive?," *Journal of Monetary Economics*, March 1989, pp. 177–200; and Alicia H. Munnell, "Why Has Productivity Growth Declined? Productivity and Public Investment," *New England Economic Review*, January/February 1990, pp. 3–22.

¹¹ Labor productivity, in these projections, is represented by real GNP per employee. Based on historical relationships between overall GNP per employee and private business productivity, the Office of Productivity and Technology of the Bureau of Labor Statistics has estimated that the 1.0-percent growth in GNP per employee between 1990 and 2005 adjusts to a 1.3- to 1.4-percent rate of growth in output per hour in the private business sector, the more traditional historic measure of labor productivity.

¹² See Fullerton, "The baby boom moves on."