



# The aggregate structure of the economy

*Improved foreign trade and productivity, as well as a continuing emphasis on services, mark the outlook for the coming decade as gross national product growth slows because of a decline in population growth*

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In a previous issue of the *Monthly Labor Review*, the Bureau of Labor Statistics published projections of the U.S. economy to the year 2000.<sup>1</sup> In this article, three alternatives which replace the earlier projections are examined: moderate-, low-, and high-growth projections. These alternatives are designed to provide a range of potential output and employment growth patterns during the 1990's, a range encompassing different assumptions about those items which affect future employment growth and which are difficult to project with any certainty.

The moderate-growth projection encompasses an economy which shows a more moderate rate of gross national product (GNP) growth in the coming decade than that for the previous 12 years. This slowing is due primarily to a slowing of labor force growth in an economy that is expected to continue reducing the Federal budget and foreign trade deficits. By way of comparison, the high-growth projection exhibits marked improvements in output growth during the period 1988 to 2000 as compared with the earlier period, due to higher population growth, less slowing in labor force growth, and a much higher rate of growth of labor productivity. Finally, the low-growth economy is characterized by much higher unemployment rates, higher inflation, continually increasing deficits in both Federal and foreign trade, much lower growth in productivity, and deeper swings in the business cycle. Projected rates of growth in real GNP for the period 1988–2000 range from 1.8 per-

cent annually in the low-trend projection to 3.2 percent each year in the high-trend projection.

By 2000, under the assumptions used by the Bureau in developing the projections, GNP ranges from \$4.9 trillion to \$5.8 trillion (in constant 1982 dollars), with disposable personal income between \$3.2 and \$3.8 trillion. Civilian employment is expected to range from 128.3 million persons in the low-trend projection to 141.7 million in the high-trend scenario, with the unemployment rate between 7 percent in the low and 4 percent in the high. Even in the high-growth projection, the average annual increase in employment is only 2.2 million, still lower than the 2.6 million average annual increase during the previous 12 years, from 1976 to 1988. Under the low-trend assumptions, employment is projected to increase by just 1.3 million persons each year. Table 1 shows the levels and growth rates of selected key economic variables for the period 1976–88 and projected to 2000.

## Framework of the projections

Periodically, BLS solicits proposals for a macroeconomic model for use in developing the projections. The current aggregate economic projections were prepared using the Data Resources, Inc., Annual Model of the U.S. Economy, a relatively small-scale model that simulates long-term macroeconomic policy.<sup>2</sup> Just over 200 exogenous variables are provided to the model to generate alternative economic

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outcomes for the U.S. economy. BLS analyses of the properties of medium-term models have shown that a relatively small number of these variables significantly affect the long-term projections of employment and major demand categories of GNP.<sup>3</sup> The assumptions entering into the variables are summarized in table 2 and are discussed below.

The projections are generally prepared with certain variables, 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, much more carefully evaluated than others. These target variables assist BLS in defining the important parameters for which alternatives are developed, but in no way should they be considered fixed. Rather, the preliminary values of these variables provide a test of reasonableness against which the overall projection results may be compared.

First, major target assumptions were made regarding business cycle fluctuations in the 1990's. Critical reviews of past projections have indicated that certain sectors of the economy, notably durable goods consumption and investment in equipment and structures, are overstated when no business cycle is present. Consequently, in order to improve the accuracy of the projections, two recessions have been

hypothesized for the period 1988–2000. It is important that this attribution not be read as a prediction by the BLS of recessions in any specific years. Rather, it is a bow to the seeming inevitability of business cycle fluctuations and the impact they have on the distribution and levels of demand GNP components.

A second major target variable used in evaluating a projection was the general trend expected for the unemployment rate. In a business cycle, the percent of the labor force out of work can be expected to rise dramatically, and it can be expected to fall just as dramatically during recovery periods. Nonetheless, a general trend in the underlying unemployment rate should be apparent in any given set of scenarios. Specifically, in the moderate-growth alternative, the unemployment rate is assumed to tend toward 5.5 percent, the level attained in 1988, a period following a long, sustained economic recovery and well-controlled inflation. The unemployment rate targets in the high- and low-growth scenarios are 4.0 percent and 7.0 percent, respectively.

#### Assumptions of moderate growth

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

*Fiscal policy.* Following the Vietnam 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. Real purchases of defense-related goods and services grew at an annual rate of 4.8 percent. A large proportion of this growth was attributable to research and development on the Strategic Defense Initiative program. Increased pressure to trim the budget deficit resulted in a \$2 billion cut in real defense spending in 1988. This move away from an emphasis on defense spending is assumed to continue throughout the coming decade, with real spending on military goods and services dropping at an average annual rate of 1.3 percent per year between 1988 and 2000.

Federal spending on nondefense purchases of goods and services grew at a real rate of only 0.6 percent a year between 1976 and 1988. As a result, such spending declined as a share of

**Table 1. Civilian unemployment rate and growth rates of selected key economic variables, 1976–88 and projected to 2000**

Item	1976	1988	2000		
			Low	Moderate	High
Civilian unemployment rate . . . . .	7.7	5.5	7.0	5.5	4.0
<b>Annual growth rate</b>					
		1976–88	1988–2000		
			Low	Moderate	High
<b>Economic variable:</b>					
Real GNP . . . . .	2.9	1.5	2.3	3.2	
GNP implicit deflator . . . . .	5.6	6.1	4.7	4.6	
Civilian labor force . . . . .	2.0	1.0	1.2	1.6	
Employment, household basis . . . . .	2.2	.9	1.2	1.5	
Real disposable personal income . . . . .	2.8	1.3	2.1	2.7	
Real disposable per-capita income . . . . .	1.8	.5	1.4	1.9	

GNP, from 2.4 percent in 1976 to just 1.7 percent in 1988, a post-World War II historical low. Numerous domestic Federal programs declined during this period. Recently, pressure has been growing for a larger dollar commitment by the Federal Government to many of these programs. Thus, real nondefense spending is expected to strengthen somewhat during the coming decade, growing at 2.0 percent each year between 1988 and 2000. Of course, this is still a slower rate of growth than that expected for overall GNP; thus, the decline in nondefense spending as a share of GNP is not reversed by this assumption, but merely halted at the 1.7-percent level of 1988.

Federal transfer payments to persons are determined in the BLS projections as a function of general economic conditions and a basic background level of transfers, that is to say, the real level of transfer payments that would be expected during periods of sustained high employment. This background level is expected to grow at a real rate of 2.8 percent a year between

1988 and 2000, down slightly from its 3-percent-per-year growth rate during the preceding 12 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 just the past few years. From 1988 to 2000, grants-in-aid are expected to grow at a real average annual rate of 0.8 percent, up markedly from the 1.1-percent average annual decline between 1976 and 1988, 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

**Table 2. Major assumptions affecting aggregate economic projections, 1976, 1988, and projected to 2000**

Item	1976	1988	2000			Average annual rates of growth			
			Low	Moderate	High	1976-88	1988-2000		
							Low	Moderate	High
Total population	218.17	246.05	268.26	268.26	272.33	1.0	0.7	0.7	0.7
Population age 0 to 5	15.62	18.27	16.90	16.90	17.78	1.3	-.6	-.6	-.3
Male population, age 25-54	39.00	51.25	58.90	58.90	59.97	2.3	1.2	1.2	1.2
Population age 16 and over	160.32	189.81	210.13	210.13	210.98	1.4	.9	.9	.8
Population age 16-19	17.19	14.89	15.21	15.21	15.13	-1.2	.2	.2	.1
Population age 22 and over	134.79	167.49	187.54	187.54	188.28	1.8	.9	.9	.9
Population age 65 and over	23.28	30.40	34.88	34.88	34.73	2.2	1.2	1.2	1.1
Trend household formation	73.32	91.00	103.95	104.38	105.58	1.8	1.1	1.2	1.2
Defense purchases (1982 dollars)	157.5	263.4	220.4	225.3	280.0	4.4	-1.5	-1.3	.5
Nondefense purchases (1982 dollars)	66.8	71.6	85.7	90.5	95.8	.6	1.5	2.0	2.5
Grants-in-aid to State and local governments (1982 dollars)	98.6	86.4	93.0	94.6	96.3	-1.1	.6	.8	.9
Federal transfers to persons, base level (1982 dollars)	238.5	338.8	447.1	463.3	471.6	3.0	2.3	2.6	2.8
Federal corporate profits tax rate	48.00	34.00	34.00	34.00	34.00	-2.8	.0	.0	.0
State and local corporate profits tax rate	5.65	10.41	12.76	12.77	12.77	5.2	1.7	1.7	1.7
Federal personal taxes, marginal rate	27.30	23.31	23.76	23.76	23.76	-1.3	.2	.2	.2
Social insurance tax rate	12.78	16.18	17.52	17.52	17.52	2.0	.7	.7	.7
State and local indirect business taxes	58.3	129.5	323.7	317.3	290.2	6.9	7.9	7.8	7.0
Interstate highway miles	38,182.4	41,979.3	42,479.9	42,479.9	42,479.9	.8	.1	.1	.1
Federal gasoline tax	4.00	9.97	9.97	12.00	9.97	7.9	.0	1.6	.0
State and local gasoline tax	7.69	14.77	30.15	30.15	30.15	5.6	6.1	6.1	6.1
Required reserve ratio, demand and time deposits	1.339	1.125	1.098	1.099	1.100	-1.4	-.2	-.2	-.2
Nonborrowed reserves	25.53	61.25	148.73	143.72	135.03	7.6	7.7	7.4	6.8

business conditions, the progressive nature of the tax system, surcharges, tax credits, and tax law changes. It has been assumed that there will be no changes in the tax law that will affect, in any significant manner, the currently mandated tax rates for corporations or persons, or social insurance and indirect business taxes.

*Monetary policy.* In the Data Resources long-term economic model, the monetary sector has been designed to determine the rate of growth of the money supply commensurate with long-term stable growth, as well as 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 accommodating, maintaining a roughly constant rate of growth of velocity and stable interest rates.

*Demographic considerations.* The population estimates underlying the aggregate projections are the middle-growth series developed by the Bureau of the Census.<sup>4</sup> The middle-level civilian labor force projections, developed by BLS to be consistent with the Census Bureau population projections, are incorporated into the moderate-growth scenario in place of labor force estimates derived in the long-term model.<sup>5</sup> The only other major demographic assumption is the new-household formation rate, derived from earlier Census Bureau projections and modified by BLS to reflect the later population data.

*Energy.* The demand for energy is determined within the DRI 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 the calculated level of demand is imported. The average import price of crude petroleum is determined within the model. Imported oil is assumed to account for just over 44 percent of domestic consumption by 2000, down considerably from the 63.2 percent import share in 1988, but consistent with projections developed within the Department of Energy.<sup>6</sup>

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

### Results of moderate-growth projection

As noted previously, GNP, or the sum total of all goods and services produced for final consumption, is projected to increase in real terms at an average annual rate of 2.3 percent between 1988 and 2000, a significant slowdown from the prior 12-year period, during which GNP increased at an average rate of almost 3.0 percent.

The goods and services our economy can produce are a function of the available supplies of the factors of production. At the aggregate level of detail, the two most important factors of production are labor and capital. The labor input to the production process is expected to slow markedly during the coming decade as population growth and, therefore, the labor force slows. Between 1976 and 1988, employment—that is, the number of persons employed—increased at an average annual rate of 2.2 percent, resulting in a gain of more than 26 million employed persons, or 2.2 million per year on average. A slower population growth rate from 1988 to 2000 results in employment growth slipping to 1.2 percent per year during that period, an increase of 18.2 million.

In the moderate-growth projection, labor productivity, as measured by real GNP per employee, is expected to grow at an average annual rate of 1.0 percent between 1988 and 2000, only a slight improvement from the previous 12-year period, when it increased by 0.7 percent each year.

To understand why labor productivity is expected to improve only very little during the coming decade, it is necessary to turn to the other major factor of production, the capital stock. Between 1976 and 1988, the productive capital stock grew by almost 1.5 billion dollars in real terms, an annual rate of growth of 3.3 percent. When the capital stock is adjusted for capacity utilization, the rate of growth was an even more impressive 4.0 percent a year over the past 12 years. In order to maintain this high rate of growth of the capital stock and, as a result, strong growth in labor productivity, a major shift in the distribution of GNP is required, one unprecedented in historical terms. As we shall see in a later section, although investment is expected to account for slightly increasing shares of GNP in the coming decade, the increase will not be enough to stimulate such strong growth in the capital stock. In fact, at a projected annual rate of growth of 2.6 percent, the capital stock is expected to grow more slowly

*Consumer spending is projected to grow at a slower rate in the coming decade than at any time in the postwar era.*

between 1988 and 2000 than during the earlier period. Adjusting for capacity utilization drops this rate even more, to 2.4 percent. Such a rate of growth is still adequate to generate some increases in labor productivity relative to growth in the 1970's and 1980's, but not high enough to warrant a return to the high productivity growth of the 1960's.

Nonetheless, the moderate-growth projection offers the prospect of a basically healthy economy, one in which both the Federal Government and foreign trade deficits are moderated, inflation remains at low to moderate rates, and employment growth stays relatively high.

The following subsections examine in more detail the demand components of GNP and the GNP as income. A summary of demand growth is shown in table 3, and the sources and uses of income are presented in table 4.

*Personal consumption.* As its name implies, this category of gross national product represents the spending by individuals for goods, both durable and nondurable, and services. Consumption is primarily affected by income growth, but it is also determined by demographic factors, such as population growth and changes in the composition of the population by age, and changes in the relative prices of consumer goods and services. Consumer spending is projected to grow at a slower rate in the coming decade than at virtually any time in the post-war era. For the most part, this slowing reflects slower population growth and lower household formation rates, but it also occurs because of generally slower growth in disposable income. The slowdown in income growth takes place because of generally slower economic growth and an increasing tax take, as an ever larger share of income falls into higher tax brackets.

Consumption expenditures, as a proportion of GNP, have increased from the mid-1970's

through the present time, attaining a share that was surpassed only in the few years immediately following World War II, as pent-up wartime demand was finally satisfied. While trade and government budget deficits have made the current high levels of consumption expenditures possible in the short run, many argue that they are not sustainable over the long run. Personal consumption is now near 65 percent of GNP, up from 63.8 percent in 1976. By 2000, consumption is expected to drop back down to 64.3 percent of GNP, a share of the economy's productive capacity more in keeping with long-term relationships.

Demographic factors play a critical role in determining the amount and composition of long-term consumer expenditures. Population growth in general and labor force growth in particular are crucial determinants of potential GNP growth. The expected slowdown in annual population growth, from 1.0 percent over the past 12 years to 0.7 percent over the next 12, reduces the potential growth of both output and consumption: both the number of workers and the number of consumers will be growing more slowly. In addition, the changing age structure of the population has three major implications for consumer spending over the remainder of the century.

First, and most important, the baby-boom generation is moving out of its initial household-forming years and into its peak earning years. This trend will weaken demand for household furnishings, except to the extent that this component of the population can be persuaded to upgrade existing furniture. As baby-boomers' income grows, however, demand for consumer electronics and other, more discretionary items should be boosted. This will partially offset the general decline in demand growth for these goods due to weakening overall income growth.

Table 3. Gross national product by major demand categories, 1976, 1988, and projected to 2000

Category	Billions of 1982 dollars					Percent distribution					Average annual rates of change			
	1976	1988	2000			1976	1988	2000			1976-88	1988-2000		
			Low	Moderate	High			Low	Moderate	High		Low	Moderate	High
Gross national product .....	\$2,826.7	\$3,996.1	\$4,771.9	\$5,222.4	\$5,840.4	100.0	100.0	100.0	100.0	100.0	2.9	1.5	2.3	3.2
Personal														
consumption .....	1,803.9	2,592.2	3,087.7	3,356.5	3,592.6	63.8	64.9	64.7	64.3	61.5	3.1	1.5	2.2	2.8
Investment .....	431.4	721.8	893.0	956.2	1,207.3	15.3	18.1	18.7	18.3	20.7	4.4	1.8	2.4	4.4
Exports .....	274.5	504.8	776.3	879.9	1,116.1	9.7	12.6	16.3	16.8	19.1	5.2	3.7	4.7	6.8
Imports .....	-285.4	-605.0	-787.5	-829.1	-1,038.5	-10.1	-15.1	-16.5	-15.9	-17.8	6.5	2.2	2.7	4.6
Government .....	580.3	782.3	802.3	858.9	962.8	20.5	19.6	16.8	16.4	16.5	2.5	.2	.8	1.7
Federal .....	224.3	328.7	293.0	315.8	375.8	7.9	8.2	6.1	6.0	6.4	3.2	-1.0	-.3	1.1
State and local ..	356.0	453.6	509.3	543.1	587.0	12.6	11.4	10.7	10.4	10.1	2.0	1.0	1.5	2.2

NOTE: Historical data are from the U.S. Department of Commerce.

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Second, the number of children will decline over the next 12 years, resulting in weakened demand for toys and children's apparel.

Last, the elderly population will increase only slightly in the 1990's. In fact, the share of the population over age 65 will remain virtually constant between 1994 and 2000. Furthermore, this age group's share of total income will not rise significantly through the end of the century. This will limit somewhat the growth of demand for medical services. However, the fact that those over age 85 are the fastest growing population group is expected to keep demand growth for medical services strong. As this broad age group moves into the 75-and-over category after the turn of the century, the impact on medical spending for the elderly will be felt even more strongly. The shifting shares of consumption, stated in constant 1982 dollars, among the various categories of spending are shown in table 5.

*Motor vehicles and parts.* The U.S. automotive market has reached a plateau: virtually all of the macroeconomic determinants of car sales—the labor force, the number of households, and the driving-age population—are expected to grow far more slowly in the coming decade than during the past 12 years, resulting in a slower rate of growth in automobile sales. The cost of car ownership is also expected to rise with increasing gas prices throughout the projection period.

Industry trends, as well, support a slow-growth sales outlook. Loan maturities are increasing—from around 4 years in 1984 to almost 5 presently—leaving many buyers with a debt

burden greater than the value of the car for a longer period of time. In such positions of "negative equity," buyers are inclined to wait a bit longer before trading the vehicle for a new one; longer trade-in cycles and a lower scrap-age rate are a direct result. This tendency is reinforced by the manufacturer's policy of offering extended warranties, providing the buyer more comprehensive protection for a longer period of time.

Parts sales are expected to be relatively higher over the coming decade as cars are held longer. Taken together, motor vehicles and parts sales, in real terms, are expected to grow at a very moderate pace of 1.8 percent each year between 1988 and 2000, down from the much higher real sales pace of 4.1 percent annually between 1976 and 1988.

*Other durable goods.* Real spending on furniture, household equipment, and all other durable goods was by far the fastest growing component of consumer spending over the past 12 years, increasing at an average annual rate of 5.2 percent between 1976 and 1988. This situation was due to several factors. First, the baby-boom generation was in its prime household-forming stage. Second, baby-boomers developed a taste for "high-tech" consumer electronics. Finally, rapid advances in technology brought new, sophisticated electronic products into the market at lower prices.

Owing primarily to the expected slowdown in the rate of household formation, spending growth in the category of other durable goods is projected to slow dramatically over the projec-

Table 4. Gross national product as income, 1976, 1988, and projected to 2000

[Billions of current dollars, except where noted]

Category	1976	1988	2000			Percent distribution					Average annual rate of change			
			Low	Moderate	High	1976	1988	2000			1976-88	1988-2000		
								Low	Moderate	High		Low	Moderate	High
Gross national product	\$1,782.8	\$4,864.3	\$10,862.3	\$11,027.0	\$12,245.8	100.0	100.0	100.0	100.0	100.0	8.7	6.9	7.1	8.0
Net national product	1,603.6	4,357.9	9,765.2	9,924.3	11,018.1	89.9	89.6	89.9	90.0	90.0	8.7	7.0	7.1	8.0
National income	1,441.4	3,968.4	9,015.7	9,053.2	9,968.1	80.9	81.6	83.0	82.1	81.4	8.8	7.1	7.1	8.0
Compensation	1,057.9	2,904.7	6,532.1	6,613.9	7,383.8	59.3	59.7	60.1	60.0	60.3	8.8	7.0	7.1	8.1
Proprietors' income	137.7	324.5	641.7	691.8	723.9	7.7	6.7	5.9	6.3	5.9	7.4	5.8	6.5	6.9
Rental income	11.9	19.3	30.6	35.6	34.4	.7	.4	.3	.3	.3	4.1	3.9	5.2	4.9
Corporate profits	145.2	328.4	436.6	619.7	659.3	8.1	6.8	4.0	5.6	5.4	7.0	2.4	5.4	6.0
Net interest	88.8	391.5	968.6	1,178.4	1,242.7	5.0	8.0	8.9	10.7	10.1	13.2	7.8	9.6	10.1
Personal income	1,451.4	4,062.1	9,113.5	9,174.5	10,049.5	81.4	83.5	83.9	83.2	82.1	9.0	7.0	7.0	7.8
Disposable personal income	1,252.6	3,471.8	7,766.5	7,807.1	8,379.3	70.3	71.4	71.5	70.8	68.4	8.9	6.9	7.0	7.6
Billions of 1982 dollars	2,000.8	2,788.3	3,247.4	3,590.1	3,818.6	...	...	...	...	...	2.8	1.3	2.1	2.7
Per capita, current dollars	5,741.4	14,103.0	28,950.4	29,560.1	31,210.3	...	...	...	...	...	7.8	6.2	6.4	6.8
Per capita, 1982 dollars	9,170.8	11,326.0	12,076.2	13,382.5	14,223.1	...	...	...	...	...	1.8	.5	1.4	1.9

tion period, to an average rate of 2.6 percent annually. Nonetheless, the category will remain among the growth leaders of consumption. The demand for consumer electronics will remain strong, while that for most other durables, such as sporting goods, jewelry, books, boats, aircraft, and optical goods, will moderate somewhat over the next 12 years.

**Energy.** Consumer demand for gasoline and motor oil, home heating oil and natural gas, and electricity exhibited the weakest growth of all sectors of consumer demand during the period 1976–88—only 0.8 percent each year in real terms. This was due to several factors, most notably mandated miles-per-gallon targets for new cars, more efficiently designed and insulated homes, and general concern about the growing U.S. energy deficit. Although some of these factors appear to be less influential in the later period of the 1980's, the price of oil is expected to rise at a moderately strong pace during the coming decade, as many of the fears of oil embargoes are being replaced by fears of environmental degradation. Thus, the growth of energy use by consumers is expected to proceed at roughly the same pace during the remaining years of the century—0.7 percent per year.

**Food, clothing, and other nondurables.** In the short run, apparel sales can be quite volatile, depending on the match between consumers' fashion preferences and manufacturers' decisions. Long-term growth, however, is more sensitive to growth in population and income than to fashion trends, and these factors undercut clothing spending growth over the projection period. The only strength in this sector comes from a moderation in price increases, due to the slower descent of the dollar and increased domestic sourcing by the apparel industry.

While never a rapid growth category, food spending is also expected to slow in real terms. Primarily responsible for the slowdown is slower population growth, although slower income growth is expected to limit restaurant receipts growth as well.

Real spending for other nondurable goods, which include items such as drugs, toiletries, tobacco, cleaning supplies, and many other consumer items, is expected to continue to be relatively slow, although growth will probably weaken less here than for many other consumer spending categories. The shrinking number of homemakers will contribute to added spending weakness throughout this category.

**Services.** Growth in spending on housing is expected to moderate by only a very small amount. Spending on housing grew at an aver-

**Table 5. Major components of personal consumption, 1976, 1988, and projected to 2000**

Category	1976	1988	2000		
			Low	Moderate	High
<b>Constant 1982 dollars (thousands)</b>					
Total personal consumption . . .	\$1,804.0	\$2,592.2	\$3,024.8	\$3,356.5	\$3,592.6
Motor vehicles . . . . .	109.6	177.7	196.3	220.6	230.6
Other durables . . . . .	215.0	392.4	488.1	532.5	591.9
Fuels . . . . .	185.9	204.3	203.6	222.1	261.0
Other nondurables . . . . .	496.1	616.7	673.4	758.1	789.1
Housing . . . . .	273.3	366.5	447.1	471.6	502.2
Other services . . . . .	524.1	834.6	1,016.3	1,151.6	1,217.8
<b>Percent distribution</b>					
Total personal consumption . . .	100.0	100.0	100.0	100.0	100.0
Motor vehicles . . . . .	6.1	6.9	6.5	6.6	6.4
Other durables . . . . .	11.9	15.1	16.1	15.9	16.5
Fuels . . . . .	10.3	7.9	6.7	6.6	7.3
Other nondurables . . . . .	27.5	23.8	22.3	22.6	22.0
Other services . . . . .	29.2	32.2	33.6	34.3	33.9

age annual rate of 2.5 percent between 1976 and 1988 and is projected to drop to a 2.1-percent rate of growth during the remainder of the century.

Other services present a different story, however. Spending on services other than housing accounted for the third-highest growth rate among consumer spending categories during the period 1976–88, a rate of 4.0 percent a year, falling behind only the spending rates for the two consumer durable categories. In the coming decade, slower population and income growth will contribute to a weakness in all of the consumer service categories. Offsetting this, however, is the tendency to a more service-oriented economy.

Higher income families demand increasingly more sophisticated banking and investment services. The significant jump in two-earner families and single heads of household over the last 12 years has resulted in increasing demands for all sorts of personal services—maids and child care, for example. Households have also been spending larger proportions of their income on legal services, while high-technology innovations have led to a greater array of more expensive medical services available to consumers. In short, the tendency to a more service-oriented economy will offset many of the weakening factors mentioned earlier, leading to personal consumption of services accounting for the highest rate of growth of all the consumption categories—2.7 percent each year between 1988 and 2000.

**Business investment.** This category of the GNP represents spending by businesses on equipment

and on buildings such as factories, commercial establishments, and offices. Between 1976 and 1988, fixed business investment modestly increased its share of the GNP from 10.3 to 12.4 percent, reflecting a real rate of growth of 4.4 percent each year. Like GNP as a whole, business investment is expected to grow more slowly during the next 12 years—3.0 percent real growth each year between 1988 and 2000—but it will continue to account for larger portions of the GNP. By 2000, real business fixed investment is expected to account for 13.3 percent of GNP, even while declining sharply during the two recessionary periods hypothesized for the coming decade. The mix of investment types, in constant 1982 dollars, is also projected to change in the decade ahead, as shown in table 6.

Over the past decade, fixed business investment has been increasingly devoted to replacement rather than net addition to the capital stock. This is partly a reflection of the growing importance of computers in business spending. More generally, it also represents a rise in real long-term interest rates and capital cost, which encourages investment in short-term, cost-reducing assets and discourages investment in long-term, capacity-expanding fixed assets. Because real long-term capital costs are expected to decline in the 1990's, investment in somewhat more durable assets may rise, affecting long-term labor productivity.

Spending on producers' durable equipment is expected to grow at a 3.2-percent annual real rate between 1988 and 2000, down markedly from the 5.7 percent average annual rate of growth during the prior 12 years. Despite this slowdown in growth, equipment spending should grow to 10.2 percent of GNP in 2000, up from 9.1 percent in 1988, and up even further from its surprisingly low 6.6 percent share of GNP in 1976. The role of computers in equipment spending growth cannot be overemphasized. Excluding office equipment from the producers' durable equipment figure in table 6 leaves equipment spending relatively flat in terms of its GNP share. The computer component of equipment spending is one of the chief factors responsible for boosting labor productivity.

Spending on nonresidential construction as a whole is expected to grow somewhat more rapidly during the coming decade than it did during the last 12 years, something of a different story from most categories of GNP.

The largest component of investment in structures, as a category of GNP, is investment in buildings other than public utilities and mining and petroleum drilling. The depreciation lifetimes laid down by the Economic Recovery Tax Act of 1981 led to a tax-related investment surge in offices and other commercial buildings during the early 1980's. The Tax Reform Act of 1986 removed many of the tax-shelter incentives, but not the building supply. Vacancy rates have begun to retreat from their peak, but excess capacity is not expected to be drained out of the economy until the early 1990's. Combining the modest recovery this implies after 1993 for commercial buildings with the capacity-straining improvements expected in foreign trade balances leads to this category of nonresidential construction growing at an average annual real rate of 2.3 percent between 1988 and 2000, down moderately from the 3.5-percent rate of growth attained from 1976 to 1988.

The most dramatic changes in business investment, however, have to do with the other two categories of nonresidential construction—public utilities and mining and petroleum drilling. Public utility construction has declined steadily as a share of real GNP since the early 1970's and will likely drop further before stabilizing in the early 1990's. Electric utilities overestimated demand and made excessive additions to their capacity in the 1970's and early 1980's. As a result, their capital spending has declined. However, projected growth in energy consumption is expected to absorb this excess capacity by the early 1990's, resulting in a resurgence of growth thereafter. This modest real growth, projected at an annual average rate of 1.5 per-

Table 6. Categories of investment, 1976, 1988, and projected to 2000

Category	1976	1988	2000		
			Low	Moderate	High
<b>Constant 1982 dollars (thousands)</b>					
All investments	\$453.6	\$721.8	\$910.5	\$956.2	\$1,207.3
Nonresidential	290.6	487.5	666.3	697.1	892.3
Producers' durable equipment	186.2	362.4	519.8	530.1	698.0
Structures	104.4	125.1	146.6	167.0	194.3
Public utilities	29.9	25.3	26.7	30.4	37.7
Mining and petroleum	20.9	18.8	28.7	30.5	41.4
Other	53.7	81.0	91.2	106.1	115.2
Residential	140.8	191.8	227.0	244.9	275.4
Inventory change	22.2	42.5	17.2	14.2	39.6
<b>Percent distribution</b>					
All investments	100.0	100.0	100.0	100.0	100.0
Nonresidential	64.1	67.5	73.2	72.9	73.9
Producers' durable equipment	41.0	50.2	57.1	55.4	57.8
Structures	23.0	17.3	16.1	17.5	16.1
Public utilities	6.6	3.5	2.9	3.2	3.1
Mining and petroleum	4.6	2.6	3.2	3.2	3.4
Other	11.8	11.2	10.0	11.1	9.5
Residential	31.0	26.6	24.9	25.6	22.8
Inventory change	4.9	5.9	1.9	1.5	3.3



cent between 1988 and 2000, will be just adequate to maintain the category of investment in public utilities' share of real GNP at 0.6 percent.

The category of investment in mining and petroleum drilling activity is also currently felt to be near a trough, with some prospect for a turnaround possible as oil prices increase throughout the 1990's. Moderate growth is expected to occur during the decade.

*Residential investment.* From 1976 to 1988, a pent-up demand for housing resulting from the high mortgage rates of the late 1970's and early 1980's, combined with favorable tax incentives for rental property, kept new construction running at a rapid 1.732 million starts per year, on average. The Tax Reform Act of 1986 and the satisfaction of much of the pent-up demand, however, reduced starts in the late 1980's. The general slowdown in population growth and its subsequent effect on household formation rates, together with the two business cycle troughs hypothesized to occur during the 1990's, are expected to further restrict new housing construction, leading to an average of 1.315 million housing starts per year between 1988 and 2000.

Although fewer households will be formed during the 1990's, due primarily to the sharp drop in birth rates in the 1960's, the growth in the population ages 35 to 64 will continue to accelerate, resulting in a continuing shift of buyers into the tradeup market. Thus, new homes will increase in size and are generally expected to increase in quality as well, leading to an increase in the average real value of a housing unit during the coming decade. This will offset, to some extent at least, the demographic-induced slowdowns in housing starts. Real spending on residential investment, which grew at an average annual rate of 2.6 percent between 1976 and 1988, is expected to moderate only slightly, to 2.1 percent, between 1988 and 2000.

*Foreign trade.* The U.S. foreign trade position, along with the Federal deficit, is currently one of the most difficult economic problems facing the economy. Imports of goods and services are determined in the BLS projection model by spending on domestic goods and by relative prices, that is, the prices of imported goods relative to comparable domestic producer prices. Exports are a function of foreign industrial production and relative prices. For both imports and exports, relative prices are adjusted for exchange rate fluctuations. The trade deficit during the 1980's jumped from \$11 billion in 1976 to almost \$140 billion in 1986.

Many factors have been cited as contributing

to the trade deficit: trade barriers abroad, the alleged poor quality of U.S. goods, the emergence of the newly industrializing East Asian nations, and a shortfall in U.S. national saving caused by an increase in Federal Government dissaving (that is, spending in excess of revenues) combined with a reduction in private saving, to name just a few. Not unimportant during the period of the late 1970's was the large increase in the value of the dollar vis-a-vis the currencies of our major trading partners, a development which led to relatively cheaper imports and a consequent rise in the trade deficit. In 1987, the value of the dollar dropped sharply, and it has continued to decline by more moderate amounts since that time. The moderate-growth BLS projection holds that this trend to a lower valued dollar will continue throughout the projection period. The initial effects of the devaluation were a worsening of the trade deficit as imports suddenly became more expensive.<sup>7</sup> Over the long run, however, consumers and businesses are expected to adjust their spending patterns, leading to marked slowdowns in import growth.

As noted previously, consumer spending is expected to moderate in growth and slowly to account for a more normal share of GNP, thus boosting private saving over the coming decade to some extent. More importantly, it has been assumed that considerable fiscal restraint will be exercised in the early to mid-1990's, resulting in a decline in the Federal deficit. Finally, foreign economic activity is expected to proceed at generally higher rates of growth than U.S. industrial production, thus providing a spur to export growth, especially in the area of manufacturing machinery, goods in which the United States excels.

The net effect of the preceding factors is a trade deficit that is projected to come into balance in real terms near the middle of the decade. Nominal trade flows then reach a balance a few years later. Note, however, that, perhaps more than any other component of the GNP, foreign trade is most critically linked to fiscal assumptions. Thus, small changes in the Federal deficit in the future, relative to the projected levels in the BLS analysis, or changes in relative exchange rates, could result in significant differences in the foreign trade figures. Table 7 details the foreign trade growth rates, both actual and projected, for major end-use categories.

Note from the table that it is not a speedup in the growth of exports but rather a sharp dropoff in the rate of growth of imports, especially of durable goods, which accounts for the projected improvement in the U.S. trade balance during the coming decade. This is most apparent in

*Business investment is expected to grow more slowly during the next 12 years, but it will continue to account for larger portions of the GNP.*

automotive imports. As foreign auto producers choose to locate production facilities in this country, their output becomes a domestic product in the eyes of the national income accountants, thus lowering import growth and at the same time increasing our exports—that is, to the extent that these U.S. production facilities are used to satisfy automotive demand in other countries.

**Government.** Since the tax cuts of 1981, the Federal budget deficit has reversed an earlier trend toward lower levels and increased rapidly, peaking at \$205.6 billion in 1986.<sup>8</sup> Thereafter, cutbacks in spending growth and a general increase in tax collections led to a lower, but still high, Federal deficit—just more than \$152 billion in 1988.

The economic growth expected for the coming decade will not be enough, by itself, to eliminate the remaining deficit. For that reason, moderation is seen over the next 12 years in both defense and nondefense spending, in grants to States and localities, and in various transfer programs. Additionally, effective personal tax rates are expected to continue to creep upward as proportionately more income reaches higher tax rates, attaining historically high levels toward the end of the decade.

All of these efforts are projected to lead to a balanced Federal budget relatively late in the century, as table 8 shows.

On the State and local government side, it is expected that the trend toward tax-limiting referendums prevalent during the 1980's will gradually ease as people increase the demand for

services provided at the State or local level. Because grants-in-aid from the Federal Government will continue to account for smaller and smaller shares of State spending needs, the increased program spending will, in large part, be paid for by the States' own resources. Table 9 shows selected State budgetary items as a percent of GNP for 1976 and 1988 and projected to 2000.

**Labor productivity.** In the long run, growth in living standards is determined by the rate of growth of productivity. Between 1988 and 2000, labor productivity<sup>9</sup> growth is expected to average 1.0 percent per year, up from the 0.7-percent average growth during the previous 12-year period, but about in line with growth in labor productivity from 1964 to 1976.

The projected improvement in labor productivity growth results partly from faster growth in capital stock per worker. Labor force growth slows from 2.0 percent annually between 1976 and 1988 to 1.2 percent per year between 1988 and 2000, due to slower growth in both the population and labor force participation rates. By devoting an increasing share of real national output to capital investment, though, the annual growth rate of the effective private nonresidential capital stock increases to 3.5 percent from 3.3 percent, on average. In addition, the composition of the labor force becomes more favorable as the baby-boom generation moves into its prime working years, boosting the average experience and educational level of the work force and, therefore, its productivity.

**Income.** There are no surprising shifts in income distribution in the moderate-growth projection. Personal income accounts for a slightly smaller share of GNP in 2000 than in 1988, as does disposable personal income, reflecting primarily the shift back to a more normal share for income and spending on the personal side than the high levels of the mid-1980's. As effective tax rates continue to increase throughout the projection period, relatively less income remains for consumption.

Real per capita disposable income is expected to reach \$13,383 by 2000, reflecting a slowdown in growth from the 1976–88 period. The personal savings rate is anticipated to range between 5 and 6 percent during the next 12 years, a significant improvement over the low savings rates of the 1982–88 period of time.

In summary, the moderate-growth scenario suggests a growing economy characterized by an improving Federal deficit, a return to somewhat higher productivity growth, and the prospect of an improvement in foreign trade deficits during the coming decade. Although

Table 7. Foreign trade, 1976, 1988, and 2000 (moderate projection), and growth rates, 1976–88 and 1988–2000 (moderate projection)

Category	Year			Growth rate (percent)	
	1976	1988	2000	1976–88	1988–2000
Exports (billions of 1982 dollars)	\$274.5	\$504.8	\$879.9	5.2	4.7
Foods, feeds, and beverages	22.8	33.8	49.9	3.3	3.3
Industrial supplies	47.2	79.9	129.5	4.5	4.1
Capital goods	61.1	146.5	321.6	7.6	6.8
Automotive	24.5	28.6	49.4	1.3	4.7
Consumer goods	22.1	56.0	96.2	8.1	4.6
Services	96.8	160.0	233.3	4.3	3.2
Imports (billions of 1982 dollars)	285.6	595.7	829.0	6.3	2.8
Food, feeds, and beverages	16.6	22.5	23.1	2.6	.2
Industrial supplies	46.7	73.4	102.3	3.8	2.8
Petroleum	90.7	83.8	144.4	-.7	4.6
Capital goods	16.2	122.7	151.1	18.4	1.8
Automotive	30.6	65.6	78.2	6.6	1.5
Consumer goods	28.7	93.9	118.5	10.4	2.0
Services	56.1	133.8	211.4	7.5	3.9
Trade balance	-11.0	-90.9	50.8	...	...

**Table 8. Federal budget (expenditure and receipts), as a percent of GNP, 1976, 1988, and 2000 (moderate projection)**

Category	Percent of nominal GNP		
	1976	1988	2000
Expenditures .....	22.1	23.2	20.5
Goods and services .....	7.7	8.0	5.6
Transfer payments .....	9.2	9.1	9.7
Net interest .....	1.5	3.2	.3
Other spending .....	3.7	2.9	4.9
Receipts .....	19.1	20.1	20.6
Personal taxes .....	8.3	8.5	9.6
Corporate taxes .....	3.1	2.3	1.4
Indirect business taxes .....	1.3	1.2	.8
Social insurance .....	6.4	8.1	8.8
Surplus or deficit (-) .....	-3.0	-3.1	.1

growth will be slower than in the past 12 years, it is primarily a reflection of a slower rate of population growth, rather than any inherent weakness in the economy.

#### Alternative projection scenarios

The high- and low-growth projection scenarios mentioned earlier set bounds around the moderate-growth projection just described. These alternatives were estimated on the basis of differing sets of assumptions, as outlined in Table 2.

The low-growth projection was designed primarily to get a look at what the decade of the 1990's would be like if many problems that exist today were to persist without much improvement. Critical assumptions in this scenario include supply factors constraining the economy's ability to expand and below-trend growth in the labor force, capital stock, 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 more than \$450 billion lower in 2000 than in the moderate-growth projection, with employment lower by 5 million.

The high-growth projection, on the other hand, assumes strong growth in labor force participation, higher population levels, a major shift toward the production of investment goods, and a general moderation of inflation. The result is a GNP of \$5.8 trillion in 2000, \$618 billion higher than in the moderate projection. The sustained growth leads to an unemployment rate of 4.0 percent in 2000, implying 5 million

more 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, a 9.4 million-person difference in the civilian labor force, and a 13.4 million divergence in the number of employed persons. Major demand category summaries are given in table 3, and income comparisons are presented in table 4.

*Low-growth projection.* In the low-growth projection, the major factors affecting potential GNP growth include the labor force, projected to grow 1.0 percent a year between 1988 and 2000, and attaining a level about 300,000 persons lower in 2000 than in the moderate-growth projection; labor productivity, projected to grow at a rate of 0.8 percent a year over the projection period, as compared with 1-percent growth in the moderate-growth projection; and nonresidential capital stock, with an annual growth of 1.8 percent, well below the expected annual growth of 2.6 percent in the moderate-growth projection. A fourth significant factor lending itself to the sluggish economic performance in the low-trend projection is the inflation rate. Assumed to increase at an average annual rate of 4.7 percent between 1988 and 2000 in the moderate-growth projection, the implicit GNP deflator grows at a much higher 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 grows at an average annual rate of 1.5 percent, as compared with the 2.2-percent growth of consumption in the moderate-growth projection. Higher interest rates and lower in-

**Table 9. State budgets (expenditures and receipts), as a percent of GNP, 1976, 1988, and 2000 (moderate projection)**

Category	Percent of nominal GNP		
	1976	1988	2000
Expenditures .....	14.3	13.3	13.5
Goods and services .....	12.4	12.0	12.3
Other spending .....	1.9	1.3	1.2
Receipts .....	15.2	14.5	15.4
Personal taxes .....	2.9	3.7	4.6
Corporate taxes .....	.5	.6	.5
Indirect business taxes .....	7.2	6.8	7.1
Social insurance .....	1.1	1.1	1.1
Grants-in-aid .....	3.5	2.3	2.1
Surplus .....	.9	1.2	1.9

come growth result in particularly adverse effects on durable goods spending, with autos and housing showing the chief slowdowns. In spite of the sharp reduction in growth, however, consumer spending is expected to maintain the high share of GNP that it had in the 1980's, thus continuing to exacerbate the problem of low consumer savings and its ultimate effect on investment and productivity growth.

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 1.8 percent per year between 1988 and 2000, less than half the 4.4-percent rate of growth enjoyed by this component of GNP during the prior 12 years, and considerably lower than the 2.4-percent rate of growth projected in the moderate-growth alternative.

All of these factors result in a foreign trade deficit that continues to improve slowly over the decade, but at a much slower rate than in the other alternatives presented, and a stubborn Federal deficit of \$132 billion in 2000, still accounting for just over 1 percent of nominal GNP.

*High-growth projection.* In the high-growth projection, output growth is spurred by higher population and a slightly higher labor force participation rate, resulting in labor force growth of 1.6 percent annually between 1988 and 2000. 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 accumulation—4.5 percent annual growth over the projection period. Consequently, labor productivity is expected to grow

by 1.4 percent a year, double its growth rate between 1976 and 1988.

Personal consumption spending is projected to grow at a more rapid rate—2.8 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 other alternatives is no longer present in the high-growth alternative. Consumer spending declines to a 61.5-percent share of GNP, the lowest share since the early 1960's, as income growth outpaces the consumer's desire to spend extra income. Overall, consumption is higher in all categories, but the greatest impact of high income growth is felt in durable goods, primarily autos and housing.

Investment growth runs at a high 4.4 percent over the decade of the 1990's, equaling investment growth in the prior period from 1976 to 1988. 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, together with its impact on the productive capital stock, is due primarily to the lower inflation, nonexistent Federal deficit, and lower interest rates that prevail in the high-growth projection. These same factors also have a significant impact on exchange rates and the consequent growth in demand for exports. Although domestic demand for imported goods continues at a brisk pace, imports are expected to grow less rapidly than during the period of the 1980's, while exports are projected to increase very rapidly relative to the same period, resulting in a goods and services surplus in real terms of \$78 billion in 2000. □

## Footnotes

<sup>1</sup> September 1987; the series of five related articles was titled "Projections 2000."

<sup>2</sup> See Data Resources, Inc., "The DRI Annual Model of the U.S. Economy," *U.S. Long Term Review*, Winter 1986–87, pp. 30–42.

<sup>3</sup> 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. The same type of analysis of the DRI long-term model has been carried out, but the results have not yet been published.

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

<sup>5</sup> See Howard N. Fullerton, Jr., "New labor force projections, spanning 1988–2000," *Monthly Labor Review*, November 1989, pp. 3–12.

<sup>6</sup> See *Annual Energy Outlook 1987* (U.S. Department of

Energy, 1988). Every year, the Department of Energy publishes a range of alternative energy scenarios. Those consistent with BLS estimates of GNP and inflation were chosen for the DRI model.

<sup>7</sup> For a full discussion of this phenomenon, see J. A. Rosenswig and P. D. Koch, "The U.S. Dollar and the 'Delayed J-Curve'," *Economic Review*, July–August 1988, pp. 2–15.

<sup>8</sup> 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.

<sup>9</sup> Labor productivity, in these projections, is represented by real GNP per employee. Based on historical relationships between GNP and the business sector, 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 1988 and 2000 adjusts to a 1.3- to 1.4-percent rate of growth in output per hour in the private business sector, the more traditional historical measure of labor productivity.