Consumer spending: an engine for U.S. job growth

Personal consumption expenditures continue to account for more than 60 percent of total employment in the U.S. economy, with consumers increasingly shifting their purchases to a sophisticated array of personal services

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Consumer decisions about what to buy, how much to buy, and when to buy from the myriad of goods and services that are available today not only satisfy their own needs, but also determine how much of which goods and services ultimately will be produced. The production of these goods and services creates jobs in all sectors of the economy. Some of the jobs that are created are the direct result of production in industries that produce goods and services to meet consumer demands (final goods), and the rest are generated in industries that provide inputs for the production of final goods and services (intermediate goods). Whether employment is generated in the final-goods industries or in related intermediate industries, it originates from consumer choices and reflects the wishes of those consumers. Each component of gross domestic product (GDP), which consists of personal consumption expenditures, investments, exports, and government expenditures, contributes in varying degrees to the level and distribution of output and employment. Personal consumption expenditures, accounting for the largest share of GDP, are the main generator of employment in the economy.[1]

In 2000, employment generated by consumer spending was 83.2 million, accounting for 62 percent of total employment in the economy. Consumer spending is projected to add 11.3 million net new jobs by 2010, so that total employment resulting from consumer spending will reach 94.5 million, or 61 percent of all employment that year. The annual growth rate of employment generated by consumer spending is projected to be 1.3 percent, considerably less than the 1.8-percent growth rate during 1990–2000.

From 2000 to 2010, as in the previous decade, virtually all nonfarm wage and salary employment growth is expected to be in the service-producing sector. Despite continued strong output growth resulting from consumer expenditures for durable goods, the goods-producing sector is, in fact, anticipated to lose employment, because growth in the demand for intermediate and final goods in that sector is concentrated in industries with high productivity increases.

Within the service-producing sector, the services industry is expected to have the highest growth rate, accounting for a net increase of 8.9 million jobs during 2000–10. The next-largest providers of employment are the retail trade and wholesale trade industries, which are projected to add another 2.0 million jobs. These two industry groups combined are projected to generate about 97 percent of the total increase in the nonfarm wage and salary jobs over the projection period.

In addition to providing an estimate of employment related to consumer spending by industry, this article presents estimates of changing occupational demand due to changes in personal consumption expenditures. The growth of various occupations depends primarily on the growth of industries in which those

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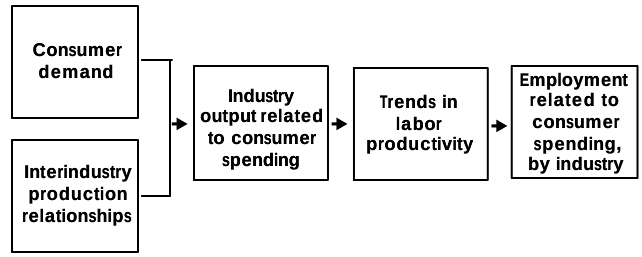
occupations are concentrated. In conformity with past trends, two major occupational groups—professional and related occupations, and service occupations—are projected to be the fastest growing, accounting for about 7.9 million jobs. These two major occupational groups will likely be responsible for more than 70 percent of the total increase in jobs over the 2000–10 period.

Methodology

The main focus of this article is to measure the domestic employment generated by consumer spending on domestically produced goods and services. That aim is part of an effort by the BLS Office of Occupational Statistics and Employment Projections to carry out medium-term economic projections of industrial and occupational employment every 2 years. The projection process involves forecasting GDP (sales to final purchasers), measuring the industrial outputs and employment generated by those sales, and converting the employment figures to occupational estimates through the use of an industry-occupation matrix.[2] The framework for such an analysis is personal consumption expenditure data from the National Income and Product Accounts and input-output data, both of which are prepared by the Bureau of Economic Analysis.[3]

The input-output system provides a snapshot of all transactions within the economy at a given point in time—sales of commodities to each industry for further processing (intermediate production) and sales to final users, including consumers, businesses, government, and foreigners (GDP, or final production). By tracing the purchase of a good or service through the entire chain of production, the employment required in each industry to produce that good or service can be measured.

First, a total requirements table is derived from the input-output "use" and "make" tables.[4] The total requirements table shows the total production required to support a dollar of final demand. The term "total" in this case includes both direct and indirect input requirements to production.[5] After its generation, the total requirements table is transformed by productivity factors (the employment-output ratio for each industry is used as a proxy for productivity) to convert the production required per dollar of demand to the employment required per dollar of demand. The resulting table, known as an employment requirements table, demonstrates how industry interrelationships in the economy affect employment. The employment requirements tables are import adjusted; that is, they are modified to account only for domestically produced sales of goods and services to final users. The process relating consumer demand to industry output and to the employment that is generated as a result is exhibited in the following diagram:



The trends in labor productivity will dictate whether increases in demand are coincident with decreases or increases in employment and labor requirements.

Industry employment is translated to occupational employment with an industry-occupation matrix that shows the distribution of jobs by occupation within each industry. The information on staffing patterns is developed from the Bureau's Occupational Employment Statistics survey.[6] Using the industry-occupation matrix, researchers multiply industry employment by these staffing patterns to generate the occupational employment attributable to consumer spending on domestically produced goods and services.

In the sections that follow, consumption expenditures are discussed both in the aggregate and as a component of GDP. Then industrial outputs are examined in light of consumer demand. Finally, the demand for occupations related to personal consumption expenditure is discussed.

Personal consumption expenditures

During the past three decades, personal consumption expenditures grew rapidly, and its share in GDP increased consistently. (See table 1.) In 1970, as baby boomers became a dominant force in the U.S. economy, consumer spending rose to 64.8 percent of GDP. The share increased to 65.2 percent in 1980 and 66.7 percent in 1990. In the economic expansion of the 1990s, along with rising disposable incomes, consumer spending's share of the GDP increased further, to 67.8 percent by 2000. The Bureau projects that, by 2010, 68.5 percent of GDP will be accounted for by personal consumption expenditures.

During both the 1980–90 and the 1990–2000 period, consumer spending grew at 3.4 percent each year, 0.2 percent higher than the growth of GDP. The higher growth of personal spending relative to GDP was made possible by a declining savings rate, as well as the wealth effect of an ever-increasing value of stock market assets. BLS projections for the U.S. economy during 2000–10 show growth of 3.5 percent for personal consumption expenditures, 0.1 percentage point higher than the GDP growth rate.[7]

The components of personal consumption expenditures—durable goods, nondurable goods, and services—all enjoyed growth during the past several decades, but at different rates.

Table 1. Personal consumption expenditures, 1980, 1990, and 2000 (actual) and 2010 (projected)

Category	Billions of chained 1996 dollars				Average annual rate of change (percent)		
	1980	1990	2000	2010	1980–90	1990–2000	2000–10
Gross domestic product	$4,900.9	$6,707.9	$9,224.0	$12,835.6	3.2	3.2	3.4
Personal consumption expenditures	3,193.0	4,474.5	6,257.8	8,786.5	3.4	3.4	3.5
Durable goods	279.8	487.1	895.5	1,455.4	5.7	6.3	5.0
New light vehicles	88.3	159.9	218.6	307.3	6.1	3.2	3.5
Other motor vehicles and parts	54.1	86.2	129.3	176.2	4.8	4.1	3.1
Personal computers	.0	1.6	108.8	802.4	(1)	52.1	22.1
Software	.0	.5	17.8	36.3	(1)	43.7	7.4
Furniture	95.5	160.4	294.6	483.2	5.3	6.3	5.1
Ophthalmic products	6.2	16.1	20.4	27.7	10.1	2.4	3.1
Other durable goods	53.5	80.8	152.9	256.1	4.2	6.6	5.3
Nondurable goods	1,065.8	1,369.6	1,849.9	2,635.5	2.5	3.1	3.6
Food and beverages	585.4	722.4	881.3	1,102.8	2.1	2.0	2.3
Clothing and shoes	124.0	197.2	335.3	511.0	4.7	5.5	4.3
Gasoline and motor oil	94.8	113.1	136.6	169.8	1.8	1.9	2.2
Fuel oil and coal	17.7	13.1	13.8	15.5	–3.0	.6	1.1
Tobacco products	65.6	52.0	42.8	46.5	–2.3	–1.9	.8
Drugs and medicines	54.5	80.3	139.9	316.6	4.0	5.7	8.5
Other nondurable goods	138.9	194.3	305.7	497.5	3.4	4.6	5.0
Services	1,858.4	2,616.2	3,527.7	4,784.5	3.5	3.0	3.1
Housing	541.5	696.2	850.1	1,070.2	2.5	2.0	2.3
Household operation	202.9	259.8	377.6	579.2	2.5	3.8	4.4
Electricity	66.7	83.2	103.9	137.7	2.2	2.2	2.9
Natural gas	31.1	29.5	32.8	30.8	–.5	1.1	–.6
Telephone	40.0	62.6	141.8	296.2	4.6	8.5	7.6
Other	66.2	85.9	100.8	142.5	2.6	1.6	3.5
Transportation services	124.7	173.4	251.3	318.5	3.4	3.8	2.4
Motor vehicle leases	—	5.5	37.6	49.1	(2)	21.2	2.7
Other	—	168.1	213.6	269.2	(2)	2.4	2.3
Medical services	487.6	710.9	903.9	1,174.9	3.8	2.4	2.7
Recreation services	79.7	145.0	227.0	408.1	6.2	4.6	6.0
Personal business services	242.8	363.2	554.8	759.0	4.1	4.3	3.2
Financial services	94.4	154.2	222.7	292.5	5.0	3.7	2.8
Other	147.4	209.0	332.4	467.4	3.6	4.7	3.5
Other services	170.8	267.0	362.3	488.3	4.6	3.1	3.0
Residual[3]	–35.6	–20.5	–68.7	–789.4	...	...	...
Personal consumption expenditures ÷ GDP	65.2	66.7	67.8	68.5	...	...	...

[1] Undefined because of denominator with value zero.
[2] Not applicable.
[3] The residual is the difference between the first line and the sum of the most detailed lines.

NOTE: Dash indicates data not available.

SOURCES: Historical data, Bureau of Economic Analysis; projected data, Bureau of Labor Statistics.

Of the three consumption categories, consumer durables have had the fastest growth in the past and are projected to remain fastest in the future. Durable goods grew at a remarkable rate of 6.3 percent per year between 1990 and 2000. Personal computers grew 52.1 percent annually, and software was up 43.7 percent a year, truly a noteworthy surge in consumer spending. The Bureau projects that the growth of personal computers and software will slow a bit over the 2000–10 period, to 22.1 percent and 7.4 percent annually, respectively, but will still remain the main force behind the growth of consumer durables, at 5.0 percent annually, during the 2000–10 period.

The growth of individuals' purchases of nondurable goods is also projected to accelerate, from a 3.1-percent annual rate during 1990–2000 to a 3.6-percent annual rate between 2000 and 2010—solid growth, but considerably slower than the growth of expenditures for consumer durable goods. As a person's income rises, the proportion of that income spent on nondurable goods such as food and clothing increases at a slower pace than it increased at lower levels of income.[8] However, the category of drugs and medicines, a component of nondurable-goods purchases, is anticipated to enjoy a healthy 8.5-percent growth in the 2000–10 period, due to the aging of the baby-boom generation, strong demand for prescription drugs and medicines, and a burgeoning array of new pharmaceuticals that increasingly are being marketed directly to consumers by way of aggressive media advertising campaigns.

Services are projected to grow at a rate of 3.1 percent annually during 2000–10, slightly faster than the 1990–2000 growth rate. Population growth during the projection period is expected to boost demand for housing services and household operations—telephone services in particular. Significant growth in housing services, along with rapid growth in recreation services, is responsible for the overall growth of the service sector.

Personal consumption expenditures are presented in table 1 as they appear in the National Income and Product Accounts, including their import content. In order to measure *domestic* employment generated by consumer spending, these consumption estimates must be adjusted to reflect only domestically produced goods and services. Accordingly, consumption levels adjusted for their import content are presented in table 2 and are used to estimate the growth of both output and employment associated with consumer spending.

Consumer spending and employment

Consumer spending has always been a major generator of employment. Table 2 shows the level and growth rate of personal consumption expenditures and their relative share of total final demand for domestically produced commodities from 1985 to 2010. The table also shows consumer-related employment and its share of total employment for the same period. The share of personal consumption expenditures spent on domestic production declined from 61.3 percent in 1985 to 59.1 percent in 2000. The share of employment related to personal consumption expenditures, however, increased from 61.5 percent to 62.2 percent over the same period. The Bureau projects that consumer spending will make up 55 percent of final demand in 2010 and will generate 61 percent of total employment in the economy that year.

The decreasing share of consumer spending in total domestic final demand is expected to occur simultaneously with an increasing share of investment. In the most recent BLS projections of the U.S. economy, the growth of business investment outpaces that of household consumption as companies continue to invest in technology to enhance productivity.[9] However, historically, the share of consumer-related employment in final demand has stayed relatively stable at about 61 percent to 63 percent between 1985 and 2000.

During 1990–2000, consumer spending on domestically produced goods and services increased 3.3 percent per year. The employment generated from this spending grew at 1.8 percent annually. The Bureau projects that, over the 2000–10 period, consumer spending will grow 3.6 percent annually and the employment generated by consumption will grow 1.3 percent each year. The reason that the growth of consumer-related employment is expected to be less than the growth of consumer expenditures on domestically produced goods and services is that increases in productivity improvements and trends in efficiency and automation will likely result in more labor-saving modes of production and changes in input requirements of the industries, both of which tend to dampen employment growth.

Consumer-related employment within industries and by occupation is influenced by the following factors:

- *The size of consumer spending and its detailed commodity distribution*. Changes in the distribution and composition of consumer spending create varying levels of employment across industries and among occupations.
- *Changes in technology.* Changes in technology have been quite significant in some industries, such as computers and communications, while other industries have experienced slower rates of technological growth. Shifts in technology have greatly affected the labor intensity of many industries, resulting in less employment in some areas even while consumption continues to increase.
- *Import shares*. Purchases of imports of goods and services by consumers, businesses, and governments generally have an effect, albeit limited, on employment related to personal consumption expenditures. For example, rising imports of apparel and shoes have cut into domestic production of these items and have lowered related domestic employment.
- *Labor productivity.* The growth of nonfarm labor productivity is projected to average 2.4 percent per year from 2000 through 2010, continuing the very strong productivity growth experienced in the Nation since 1995.

Consumer spending and major industries

The U.S. economy is composed of a broad range of industries with different characteristics. Industries are characterized as either goods producing or service producing. Goods-producing industries include agriculture, forestry, and fishing; mining; construction; and manufacturing. Service-producing industries encompass transportation, communications, and public utilities; wholesale trade; retail trade; finance, insurance, and real estate; services; and government. Continuing a longstanding trend, the U.S. economy is experiencing a shift from goods-producing employment to service-producing employment. This trend can be seen in historical data, as well as in the projected numbers for the 2000–10 period, during which virtually all employment growth is expected to occur in service-producing industries. (See table 2.)

Personal consumption expenditures from the goods-producing sector grew at annual rate of 2.7 percent during 1990–2000, even as consumer-related employment in the sector declined at an annual rate of 0.7 percent. Meanwhile, over the same period, purchases from the service-producing sector grew at an annual rate of 3.5 percent, with an accompanying 2.3-percent increase in consumer-related employment. The Bureau projects that consumer-generated employment in the goods-

Table 2. Domestic consumption and employment, by major industry sector, 1985, 1990, 1995, and 2000 (actual) and 2010 (projected)

Sector	Personal consumption expenditures on domestically produced commodities (billions of 1996 dollars)					Domestic final demand spending (billions of 1996 dollars)				
	1985	1990	1995	2000	2010	1985	1990	1995	2000	2010
All sectors	3,698.3	4,295.9	4,849.0	5,969.5	8,492.7	6,035.7	7,030.9	7,956.5	10,101.6	15,457.8
Goods producing	693.4	760.3	818.2	994.5	1,650.5	1,965.5	2,200.1	2,472.6	3,339.4	5,724.7
Agriculture, forestry, and fisheries	24.8	31.9	36.7	46.3	60.8	52.9	59.4	58.4	78.6	107.1
Mining	2	.1	.1	.2	.1	39.7	28.7	28.2	36.6	40.1
Construction	.0	.0	.0	.0	.0	594.9	608.7	626.0	779.3	993.9
Manufacturing	668.5	728.3	781.4	948.0	1,589.6	1,278.0	1,503.3	1,760.1	2,444.9	4,583.5
Durables	165.9	188.0	205.7	325.0	816.1	659.5	800.6	970.3	1,565.0	3,417.4
Nondurables	502.5	540.3	575.7	623.0	773.5	618.5	702.7	789.7	879.9	1,166.1
Service producing	3,004.9	3,535.6	4,030.8	4,975.1	6,842.1	4,070.2	4,830.8	5,483.9	6,762.2	9,733.1
Transportation	80.2	86.2	106.5	140.2	197.4	140.1	172.0	211.2	255.3	382.6
Communication	62.8	85.2	112.5	167.2	337.4	75.9	103.9	136.1	201.7	388.0
Utilities	127.3	139.5	151.8	164.0	203.5	142.9	162.5	179.8	198.6	248.4
Trade	772.8	904.3	1,036.5	1,365.3	1,878.7	882.8	1,044.5	1,227.5	1,629.3	2,513.2
Finance, insurance, and real estate	900.9	1,033.4	1,162.1	1,391.8	1,956.6	977.1	1,129.4	1,286.5	1,563.0	2,272.8
Services	1,015.3	1,261.8	1,448.2	1,721.8	2,267.7	1,077.3	1,348.0	1,570.0	2,027.0	2,962.2
Government	30.9	35.2	37.2	41.4	60.4	813.1	913.7	928.4	987.0	1,078.3
Special industries	14.7	–10.0	–24.1	–16.6	–59.6	–39.0	–43.2	–55.6	–99.7	–112.4

Sector	Consumer-related employment (thousands)					Total employment (thousands)				
	1985	1990	1995	2000	2010	1985	1990	1995	2000	2010
All sectors	61,342	69,283	75,149	83,180	94,515	99,740	111,580	119,361	133,741	155,722
Goods producing	11,769	11,424	10,929	10,652	10,216	26,510	26,712	26,239	27,921	29,668
Agriculture, forestry, and fisheries	1,202	1,321	1,492	1,594	1,809	1,665	1,806	1,973	2,211	2,611
Mining	360	283	212	174	127	928	709	581	543	488
Construction	822	730	614	791	813	4,668	5,120	5,1601	6,698	7,522
Manufacturing	9,385	9,089	8,612	8,093	7,467	19,250	19,077	18,524	18,469	19,047
Durables	3,397	3,142	2,982	3,043	2,884	11,461	11,109	10,683.3	11,138	11,780
Nondurables	5,988	5,947	5,629	5,050	4,583	7,789	7,968	7,841	7,331	7,267
Service producing	49,573	57,860	64,219	72,528	84,299	73,230	84,868	93,122	105,820	126,055
Transportation	1,797	2,001	2,226	2,624	2,993	2,997	3,510	3,904	4,529	5,466
Communication	1,014	1,003	1,017	1,258	1,480	1,318	1,309	1,318	1,639	1,916
Utilities	715	735	693	629	630	916	957	911	851	893
Trade	19,243	21,506	23,010	25,730	27,769	23,048	25,774	27,565	30,331	34,200
Finance, insurance, and real estate	5,066	5,703	5,759	6,310	6,547	5,950	6,709	6,806	7,560	8,247
Services	20,294	25,356	29,999	34,560	43,495	22,607	28,305	33,313	40,230	52,898
Government	1,443	1,555	1,515	1,417	1,386	16,394	18,304	19,306	20,680	22,436
Special industries	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

Sector	Personal consumption expenditures as a percent of domestic final demand spending					Annual average growth rate of personal consumption expenditure (percent)				
	1985	1990	1995	2000	2010	1985–90	1990–95	1995–2000	1990–2000	2000–10
All sectors	61.3	61.1	60.9	59.1	54.9	3.0	2.5	4.2	3.3	3.6
Goods producing	35.3	34.6	33.1	29.8	28.8	1.9	1.5	4.0	2.7	5.2
Agriculture, forestry, and fisheries	46.8	53.7	62.9	58.9	56.8	5.2	2.8	4.7	3.8	2.8
Mining	.4	.5	.5	.5	.3	–4.6	.9	3.8	2.3	–2.3
Construction	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Manufacturing	52.3	48.4	44.4	38.8	34.7	1.7	1.4	3.9	2.7	5.3
Durables	25.2	23.5	21.2	20.8	23.9	2.5	1.8	9.6	5.6	9.6
Nondurables	81.2	76.9	72.9	70.8	66.3	1.5	1.3	1.6	1.4	2.2
Service producing	73.8	73.2	73.5	73.6	70.3	3.3	2.7	4.3	3.5	3.2
Transportation	57.2	50.1	50.4	54.9	51.6	1.5	4.3	5.6	5.0	3.5
Communication	82.7	82.0	82.7	82.9	87.0	6.3	5.7	8.2	7.0	7.3
Utilities	89.1	85.9	84.4	82.6	81.9	1.8	1.7	1.6	1.6	2.2
Trade	87.5	86.6	84.4	83.8	74.8	3.2	2.8	5.7	4.2	3.2
Finance, insurance, and real estate	92.2	91.5	90.3	89.0	86.1	2.8	2.4	3.7	3.0	3.5
Services	94.2	93.6	92.2	84.9	76.6	4.4	2.8	3.5	3.2	2.8
Government	3.8	3.9	4.0	4.2	5.6	2.6	1.1	2.2	1.7	3.8
Special industries	–37.7	23.1	43.4	16.7	53.0	–192.5	19.3	–7.2	5.2	13.6

Table 2. Continued—Domestic consumption and employment, by major industry sector, 1985, 1990, 1995, and 2000 (actual) and 2010 (projected)

Sector	Consumer-related employment as a percent of total employment					Annual average growth rate of employment as a result of personal consumption expenditures (percent)				
	1985	1990	1995	2000	2010	1985–90	1990–95	1995–2000	1990–2000	2000–10
All sectors	61.5	62.1	63.0	62.2	60.7	2.5	1.6	2.1	1.8	1.3
Goods producing	44.4	42.8	41.7	38.2	34.4	–.6	–.9	–.5	–.7	–.4
Agriculture, forestry, and fisheries	72.2	73.1	75.6	72.1	69.3	1.9	2.5	1.3	1.9	1.3
Mining	38.8	39.9	36.5	32.1	26.1	–4.7	–5.6	–3.9	–4.7	–3.1
Construction	17.6	14.3	11.9	11.8	10.8	–2.3	–3.4	5.2	.8	.3
Manufacturing	48.8	47.6	46.5	43.8	39.2	–.6	–1.1	–1.2	–1.2	–.8
Durables	29.6	28.3	27.9	27.3	24.5	–1.5	–1.0	.4	–.3	–.5
Nondurables	76.9	74.6	71.8	68.9	63.1	–.1	–1.1	–2.1	–1.6	–1.0
Service producing	67.7	68.2	69.0	68.5	66.9	3.1	2.1	2.5	2.3	1.5
Transportation	60.0	57.0	57.0	57.9	54.8	2.2	2.2	3.3	2.7	1.3
Communication	76.9	76.6	77.2	76.8	77.3	–.2	.3	4.3	2.3	1.6
Utilities	78.0	76.8	76.1	73.9	70.6	.6	–1.2	–1.9	–1.5	.0
Trade	83.5	83.4	83.5	84.8	81.2	2.2	1.4	2.3	1.8	.8
Finance, insurance, and real estate	85.1	85.0	84.6	83.5	79.4	2.4	.2	1.8	1.0	.4
Services	89.8	89.6	90.1	85.9	82.2	4.6	3.4	2.9	3.1	2.3
Government	8.8	8.5	7.8	6.9	6.2	.0	.0	.0	.0	.0
Special industries	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

NOTE: The negative values of personal consumption expenditures in special industries result from an accounting convention used to move expenditures in the United States by foreigners from personal consumption expenditures to exports. The negative values of total final demand spending in special industries result from this same accounting convention, as well as from the impact of the noncomparable imports industry (goods not capable of being produced in the United States) and the scrap, used, and secondhand goods industries. Total final demand spending in mining is negative because purchases of imports outvalue purchases of domestically produced goods.

producing sector will continue to decline, despite a 5.2-percent annual rate of growth in production, while employment in the service-producing sector will grow at a 1.5-percent rate, with about 12 million jobs added as a result of consumer spending.

Goods-producing sector. Although consumer expenditures on the goods-producing sector of the economy are projected to increase by 5.2 percent over the 2000–10 period, growth within the different industries is likely to vary significantly and have a differential impact on employment. Continuing the trend from 1990 to 2000, employment in the goods-producing sector is projected to decline by 0.4 percent per year, with the sector losing approximately 440,000 jobs over the 2000–10 period.

Within the goods-producing sector, the only two industries that are projected to have a positive growth rate of employment are agriculture, fisheries, and forestry, at 1.3 percent per year, and construction, increasing by 0.3 percent each year. The projected 1.3-percent growth rate of employment in agriculture, fisheries, and forestry is due primarily to BLS expectations regarding landscape and horticulture services and veterinary services. The expected 0.3-percent rate in the construction industry is based on the anticipated demand for new housing and continued growth in the construction of roads, bridges, and tunnels. Every other industry in the goods-producing sector is projected to have negative employment growth, despite consistent increases in consumer spending over the projection horizon.

Service-producing sector. Within the service-producing industries, the largest impact of consumer spending is on the services sector, which is projected to add a net 8.9 million new jobs by 2010. The services sector encompasses a variety of different subsectors, such as personal services; auto repair services and garages; miscellaneous repair shops; motion picture, amusement, and recreation services; business services; health services; and social services. The different categories of services are mostly labor-intensive industries with varying amounts of labor productivity, which is usually difficult to measure. More than three-fourths of the projected job growth in the services sector is concentrated in the last three subgroups—business services, health services, and social services:

1. *Business services.* Business services includes a variety of different services, such as computer and data-processing services, personnel supply services, advertising, services to buildings and miscellaneous equipment, and rental and leasing services. The business services group is expected to be the fastest-growing industry group in the services division.
2. *Health services.* The health services component, which includes hospitals, offices of health practitioners, and health-care services, is anticipated to add a large number of new jobs as aging baby boomers—the population born between 1946 and 1964—demand more of these types of service. It is worth noting that the baby boomers will be aged 46 years to 64 years in 2010.

3. *Social services.* Social services include day care and residential care services. As the labor force participation rate of women in all age groups has increased, the demand for child care has accelerated, and this trend is expected to continue into the next decade. Employment in residential care services also is projected to increase as a result of the aging cohorts of the population looking for alternatives to nursing homes and hospital care.

Projections for the other industries within the service-producing sector are as follows:

4. *Communications.* Communications services are another high-employment sector that is projected to grow as a result of consumer spending. The dominant industries in this sector are telephone and telegraph communications and the communications service industry. Strong demand for residential and business wired and wireless systems, cable systems, and high-speed Internet connections are expected to contribute to a 1.6-percent growth rate of employment in the sector.

5. *Transportation.* An increase of 3.5 percent in consumer demand and expenditure is anticipated to permit the transportation sector to enjoy a 1.3-percent rise in employment. The growth in the industry is projected to be led by an increase in employment in the trucking, courier services, and warehouse and storage industries. Trucking and warehousing are expected to provide the most new jobs. As a result of population growth and urban sprawl, local and urban passenger transit also is projected to account for a large number of new jobs in the sector.

6. *Wholesale and retail trade.* In general, overall economic growth drives both of these industries, which provide the means for getting products from manufacturers to consumers. Because consumption accounts for such a large share of economic growth, employment related to consumption in these industries is expected to be quite large as well.

7. *Finance, insurance, and real estate.* Employment growth in this sector is expected to decline from the 1990–2000 rate of 1.0 percent to 0.4 percent in the 2000–10 period. The finance sector of the industry—including depositary and nondepositary institutions and securities and commodity brokers and dealers—is projected to grow as a result of the financial needs of the baby-boom generation, which will be at the height of its saving years. The growth of tax-favorable retirement plans and the globalization of securities markets are other factors aiding employment growth in this sector. Counter to the trend, however, employment in depositary institutions is expected to decline, due to the surge in Internet banking, automated teller machines, and debit cards.

Industry ranking

Consumer-related employment as a percent of total employment was estimated and ranked for 192 industry groups in 2000 and also projected for 2010. The resulting ranking shows that most of the 192 industries are dependent on consumer spending to some degree, either directly or indirectly. The degree to which an industry depends on consumer spending for employment can be estimated by the ratio of consumption-related employment to total employment for each industry. Table 3 lists the 22 industries that are most dependent on consumer spending. All but one of these industries (private households) is a service-producing industry.

As a result of high consumer demand stemming from the combined effects of the aging of the population and advances in medical technology, the health services group is projected to be a prime source of consumer-related employment. Top industries providing health services are hospitals, offices of health practitioners, and nursing and personal care facilities. In

Table 3. Consumer-related employment as a percent of total employment, 2000 (actual) and 2010 (projected)

Industry	Employment generated by consumption as a percent of total Industry employment	
	2000	2010
Other lodging places	100.0	100.0
Hospitals	100.0	100.0
Educational services	100.0	100.0
Health services, n.e.c.	100.0	100.0
Museums and botanical and zoological gardens	100.0	100.0
Bowling centers	100.0	98.6
Private households	100.0	100.0
Amusement and recreation services, n.e.c.	99.9	100.4
Beauty and barber shops	99.5	99.2
Nursing and personal-care facilities	99.3	99.1
Offices of health practitioners	99.1	98.4
Funeral services and crematories	99.0	98.1
Videotape rental	98.8	97.7
Membership organizations	98.7	97.8
Eating and drinking places	98.4	97.8
Child day care services	97.5	97.7
Personal services, n.e.c.	97.4	95.8
Individual and miscellaneous social services	96.8	96.9
Watch, jewelry, and furniture repair	96.6	96.3
Cable and pay television services	96.3	94.8
Beverages	94.7	92.1
Residential care	94.4	95.4
Retail trade, excluding eating and drinking places	93.8	89.8

NOTE: n.e.c. = not elsewhere clasified.

the 2000–10 projection period, the aging of the baby-boom generation is expected to lead to the expansion of outpatient and ambulatory services and the continued expansion of home health care services, producing greater employment opportunities in the health-related industries.

Educational services, a labor-intensive industry with a strong link to consumer spending, is anticipated to be another top employment generator. High demand for education, mainly as a result of a growing elementary-school-age population, as well an increasing need for postsecondary education and corporate training services, will keep this industry a large generator of employment during 2000–10.

Projected strong growth in income and the resulting consumer affluence will likely benefit industries with high income elasticities of demand, such as recreation industries, as consumers spend more resources on leisure time and sports activities. The Bureau anticipates that museums, botanical and zoological gardens, bowling centers, amusement and recreation services, videotape rental services, and cable and pay television services will create a vast amount of employment, virtually all from consumer demand.

Retail trade continues to generate large employment increases, due to population growth and rising disposable income, as well as the labor-intensive nature of the industry. Similarly, all sectors of the restaurant industry—fast-food establishments, moder-ately priced restaurants, and fine-dining establishments, are expected to maintain their position as another large generator of employment.

Although service-producing industries increasingly have been responsible for the largest share of employment related to consumer spending, some manufacturing industries, such as household furniture, jewelry, silverware, and plated ware, as well as toys and sporting goods, also have been, and are projected to remain, among the large creators of employment. (See table 3.)

Major occupational groups

Employment generated by consumer spending is distributed across all occupations, to varying degrees. The transition from industry employment to occupational employment is accomplished through the use of an industry-occupation matrix that shows staffing patterns, or share distributions of occupations within each industry. Staffing patterns in various industries are developed by the BLS Occupational Employment Statistics survey.

The distribution of employment among the 10 major occupational groups listed in the Standard Occupational Classificational Manual[10] is shown in table 4. It should not be surprising that, among these groups, service occupations rank as the largest generator of consumer-related employment, with 19.5 million jobs in 2000. The category is expected to maintain its leading position in 2010, with a projected 23.4 million jobs owing, at least in part, to consumer spending. In 2010, consumer spending employment as a percent of total employment is anticipated to be 80 percent, the same as in 2000.

Professional and related occupations accounted for 13.2 million jobs in 2000, good enough for a third-place ranking. During the 2000–10 period, the group is expected to create 3.9 million additional jobs as a result of consumer expenditures, moving it up to second place in 2010. Office and administrative support occupations employed 15.1 million of the workforce and ranked second in 2000. Over the 2000–10 period, the category is projected to create 874 thousand additional jobs as a result of consumer spending, placing it third in 2010. Two occupational groups—farming, fishing, and forestry; and production—are expected to see their total number of jobs related to consumer spending decline, due chiefly to the adoption of new technologies, ongoing productivity gains,

Table 4. Consumer-related employment, by major occupational group, 2000 (actual) and 2010 (projected)

[Numbers in thousands of jobs]

Major occupational group	Total wage and salary employment		Consumer-related employment			Consumer-related employment as a percent of total employment		Average annual rate of change in employment (percent)	
	2000	2010	2000	2010	Change	2000	2010	Total	Related to consumption
Total, all occupations	133,741	155,722	83,179	94,513	11,334	62.2	60.7	1.5	1.3
Management, business, and financial	12,637	14,849	7,267	8,241	974	57.5	55.5	1.6	1.3
Professional and related occupations	24,844	31,601	13,192	17,112	3,920	53.1	54.2	2.4	2.6
Service	24,321	29,293	19,477	23,416	3,939	80.1	79.9	1.9	1.9
Sales and related occupations	13,430	15,294	10,992	11,894	902	81.8	77.8	1.3	.8
Office and administrative support	23,3939	25,640	15,078	15,952	874	64.5	62.2	.9	.6
Farming, fishing, and forestry	1,231	1,299	829	823	–6	67.4	63.4	.5	–.1
Construction and extraction	6,135	7,002	1,121	1,217	96	18.3	17.4	1.3	.8
Installation, maintenance, and repair	5,382	6,053	3,213	3,485	272	0.7	57.6	1.2	.8
Production	12,699	13,496	6,252	6,089	–163	49.2	45.1	.6	–.3
Transportation and material moving	9,669	11,194	5,719	6,250	531	59.1	55.8	1.5	.9

and a continuing gradual substitution of capital for labor, especially in the production sectors of the economy.

Of the major occupational groups, professional and related occupations are projected to grow the fastest, 2.6 percent between 2000 and 2010, twice the rate of growth of overall occupational change. The high employment growth of this group is predicated largely upon an increase in demand for some of its jobs. A variety of computer-related and health services occupations, including physician's assistants and dentists, dental hygienists, physical therapists, nuclear medicine technologists, respiratory therapists, and radiological technologists, belong to the group.

At a projected rate of 1.9 percent per year, the service occupations group would have the second-highest rate of employment growth from 2000 to 2010. This rate is the same for both consumer-related and total service employment. Service occupations are a major generator of jobs. Within the category, health care support occupations, social services occupations, and protective service occupations are among the fastest-growing subgroups.

The most rapidly growing occupations in the professional and related occupations major group are concentrated in industries with high rates of growth. In contrast, production occupations are projected to grow more slowly than overall employment, largely because nearly 3 out of 4 such occupations are in the slow-growing manufacturing sector.[11] Production occupations, which have the lowest growth among all occupations, include farming, fishing, and forestry occupations; construction and extraction occupations; and installation, maintenance, and repair occupations.

Detailed occupations

At a detailed level, the Bureau projects employment for almost 350 occupations for the U.S. economy. Consumption-related employment estimates for each of these occupations were sorted by their average annual growth over the projection period. The occupations projected to be the fastest growing are listed in table 5. Professional and related occupations, including computer support specialists and systems administrators, computer software engineers, systems analysts, computer scientists, database administrators, and desktop publishers, dominate the list. Computer support specialists and systems administrators, and computer software engineers, have the highest projected annual growth rates, 5.7 percent and 5.6 percent, respectively. Increasing demand for computer-related occupations is expected to reflect ongoing momentous advances in high technology and the continuing development of new computer applications, as well as the rising use of highly sophisticated software by an increasingly computer-aware group of consumers.

A number of other occupations from the service occupations group are projected to have significant rates of growth, including medical assistants, physician's assistants, medical records and health information technicians, physical therapist assistants and aides, and occupational therapists. Rapid growth among health-related occupations demonstrates the aging of the baby-boom generation and the increasing stratification by skill level of the health care professions. In addition, a wealthier population is better able to afford quality health care, and advances in medical technology permit an increasing number of health problems to be treated more effectively.[12] The demand for special-education teachers is expected to grow by 4.2 percent annually as a result of an increase in the number of people with certain needs and disabilities that, sometimes by law, require special education.

Note that the rankings in table 5 are based on the growth rates of the occupations and not on the actual number of jobs generated. Some high-growth occupations with a small employment base will create small numbers of jobs, while some slow-growing occupations with a large base will provide a large number of new job opportunities.

Table 6 lists the detailed occupations employing the highest number of employees, both in 2000 and projected for 2010. A variety of service occupations, including food and beverage servers and related workers; chefs, cooks, and food preparation workers; and building cleaning workers, are at the top of the list. Some sales occupations, such as retail salespersons and cashiers, also are expected to maintain a large number of jobs. Other occupations with a large number of workers are the health-related jobs, including registered nurses and psychiatric and home health aides. Office and administrative occupations, such as information and record clerks, secretaries and administrative assistants, and financial clerks, also are among the large-base occupations. Human services assistants, nurses, medical assistants, physician's assistants, and physical therapist assistants and aides are among the fastest-growing professional specialty occupations. The rapid growth of service industries, in addition to the fact that 75 percent of the entire professional specialty occupations are located within the service industries, explains the large number of job openings in the aforementioned occupations.

CONSUMER DEMAND IS THE MAIN FORCE BEHIND THE U.S. ECONOMY and, by extension, is the prime source of employment and economic growth. The significant share of GDP held by personal consumption expenditures gives consumers a power—reflected in their preferences—to command the direction and propel the growth of output and employment in many different sectors of the economy. The analysis and projections presented in this article indicate that, over the 2000–10 period, consumer expenditures will continue to shift employment from goods-producing to service-producing industries. Service-producing industries—including transportation, com-

Table 5. Projected fastest-growing occupations, 2000–10

[Numbers in thousands of jobs]

Occupation	Employment 2000	Employment 2010	Change	Average annual rate of growth (percent)
Computer support specialists and systems administrators	324	566	242	5.73
Computer software engineers	179	308	129	5.58
Semiconductor processors	10	16	7	5.31
Personal and home care aides	416	681	265	5.05
Social and human service assistants	193	3165	123	5.04
Medical assistants	316	502	186	4.75
Physician assistants	54	86	32	.74
Medical records and health information technicians	128	197	69	4.38
Desktop publishers	26	39	13	4.26
Speech-language pathologists and audiologists	56	84	29	4.22
Teachers, special education	116	174	59	4.19
Physical therapist assistants and aides	79	117	38	3.98
Veterinarians	37	55	18	3.93
Systems analysts, computer scientists, and database administrators	329	482	153	3.90
Occupational therapist assistants and aides	23	33	10	3.78

Table 6. Occupations with the largest consumer-related employment, 2000 (actual) and 2010 (projected)

[Numbers in thousands of jobs]

Occupation	2000	2010	Change	Average annual rate of growth (percent)
Food and beverage servers and related workers	6,105	7,195	1,090	1.66
Retail salespersons	3,593	3,899	306	.82
Information and record clerks	3,480	4,064	584	1.56
Cashiers	3,054	3,365	312	.98
Material-moving occupations	2,996	3,186	190	.62
Building cleaning workers	2,928	3,182	254	.83
Chefs, cooks, and food preparation workers	2,448	2,768	320	1.24
Material recording, scheduling, dispatching, and distributing occupations, except postal workers	2,351	2,380	29	.12
Financial clerks	2,330	2,364	35	.15
Secretaries and administrative assistants	2,270	2,421	151	.65
Registered nurses	1,981	2,579	598	2.67
Nursing, psychiatric, and home health aides	1,8378	2,439	601	2.87
Top executives	1,802	1,982	181	.96
Truckdrivers and drivers/sales workers	1,767	1,949	182	.98
Office clerks, general	1,622	1,833	211	1.23
Sales worker supervisors	1,338	1,430	92	.67
Teachers, preschool, kindergarten, and elementary, middle, and secondary school	1,231	1,585	354	2.56

munication, and public utilities; wholesale and retail trade; finance, insurance, and real estate; and services—are expected to account for nearly all of the 11.3 million new wage and salary jobs generated by consumer spending over the period. Continuing the employment growth patterns of the 1990–2000 period, the services and trade industry divisions will amount to nearly 97 percent of new wage and salary employment growth.

Services make up the largest and also the fastest-growing major industry group whose growth is due to consumer spending. Services are projected to add 8.9 million new jobs over the 2000–10 period, so that by 2010, the sector will provide employment for nearly 85.3 million people. More than three-fourths of this projected job growth is concentrated in three sectors of service industries: business services, health services, and social services. The expansion of the service-producing industries is anticipated to create demand for many service-related occupations, but the expected employment growth is likely to be different among different occupational groups, with professional and related occupations and service occupations growing the fastest and generating more jobs than any other occupational group over the projection horizon. □

Notes

[1] Personal consumption expenditures are defined as the market value of spending by individuals and not-for-profit institutions on all goods and services. Personal consumption expenditures also include the value of certain imputed goods and services—such as the rental value of owner-occupied homes—and compensation paid in kind—such as employer-paid health and life insurance premiums. After-tax wages, salaries, interest income, dividends, and property income, in addition to transfer payments such as Social Security, unemployment insurance, and welfare payments, are the main sources of income at consumers' disposal for spending.

[2] For a more complete discussion of the methodology used, see BLS *Handbook of Methods*, Bulletin 2414 (Bureau of Labor Statistics, September 1992), chapter 15, "Employment Projections," pp. 128–39.

[3] *Ibid.*

[4] The input-output tables for the U.S. economy were last published in *Benchmark input-output accounts of the U.S., 1992* (U.S. Department of Commerce, Bureau of Economic Analysis, September 1998). The input-output model consists of two basic tables. The first, the "use" table, describes the sale of every commodity, both to final purchasers, for use in its unaltered state, and as an intermediate product, for use as an input to the production process of other industries. This table is so named because it reflects the use of commodities by industries. The second table, called the "make" table, displays the production of commodities by each industry and reflects the reality that a commodity can be produced by a multiplicity of industries.

[5] Direct employment measures the employment actually necessary to produce a good or service within the producing industry. Indirect employment is the employment generated in all of the industries that support the producing industry with their inputs. All of these employees, direct and indirect, earn income, and their income will generally be spent on consumer goods, which, in turn, will generate a third type of employment: induced employment (also referred to as "income multiplier effects on employment"). The Bureau of Labor Statistics does not attempt to measure induced employment.

[6] The latest published Occupational Employment Statistics data are in *Occupational Employment and Wages, 2000,* Bulletin 2549 (Bureau of Labor Statistics, April 2002).

[7] For further discussions, see Betty W. Su, "The U.S. economy to 2010," *Monthly Labor Review,* November 2001, pp. 3–20.

[8] H. S. Houthakker, "An International Comparison of Household Expenditure Patterns, Commemorating the Centenary of Engel's Law," *Econometrica*, 1957, pp. 332–551.

[9] See Jay M. Berman, "Industry output and employment projections to 2010," *Monthly Labor Review,* November 2001, pp. 39–56.

[10] *Standard Occupational Classification Manual* (U.S. Department of Commerce, October 2000).

[11] For a further discussion of the category, see Daniel E. Hecker, "Occupational employment projections to 2010," *Monthly Labor Review*, November 2001, pp. 57–84.

[12] *Ibid.*