

Gross Domestic Product by Industry for 1947–86

New Estimates Based on the North American Industry Classification System

By Robert E. Yuskavage and Mahnaz Fahim-Nader

LAST month, the Bureau of Economic Analysis (BEA) released new estimates of gross domestic product (GDP) by industry for 1947–86 that are based on the 1997 North American Industry Classification System (NAICS). These estimates, together with previously published industry estimates for 1987–2000, provide the first long-term view of industry contributions to U.S. economic growth and inflation from a NAICS perspective.

These estimates also fill a major gap in the NAICS-based GDP-by-industry time series and represent a significant improvement over previously published estimates, which were based on the Standard Industrial Classification (SIC) system. The NAICS-based estimates provide industry detail that more clearly depicts the services sector's rising share of the economy. In addition, the estimates of real value added by industry are now consistent with BEA's Fisher quantity index measures of real GDP for the years before 1977. Previously, on the SIC basis, only fixed-weight constant-dollar estimates had been available for this period. As a result, the contributions of industry groups, such as manufacturing and services, to real GDP growth before 1977 can now be computed more accurately.

Generally, NAICS improves on SIC in several ways as an industry classification system. NAICS more consistently classifies business establishments into industries on the basis of similar production processes. It recognizes new and emerging industries, primarily in high-technology industries. And it provides greater detail for the services sector. However, a lack of historical source data needed to make NAICS-based estimates has limited the ability of BEA to provide reliable, detailed industry data on a NAICS basis for long historical periods.

In designing a strategy to overcome these limitations, BEA faced a variety of issues, such as the time span covered, estimation procedures, the number of data items, and the level of industry detail. In making key decisions, BEA relied on both its own research and suggestions from academic and business users with a strong interest in industry time series. These suggestions included providing data for as many years as pos-

sible, making maximum use of available historical SIC-based data, focusing on the most important data items, and considering aggregation as an acceptable means of dealing with both source data limitations and reliability concerns for earlier years.

For 1947–86, BEA prepared both current-dollar and real value-added-by-industry estimates. For 1947–76, it published estimates for 22 industry groups; for 1977–86, it published estimates for 65 industries.

This article highlights the new NAICS-based industry estimates by using them to examine the post-World War II economic shift from goods to services and to study the contributions of industry groups to major expansions and contractions. Highlights of the new GDP-by-industry data include the following:

- Private services-producing industries' share of GDP rose from 47.8 percent in 1947 to 61.2 percent in 1987. The share of finance, insurance, real estate, rental, and leasing increased the most (7.3 percentage points), followed by professional and business services (5.0 percentage points) and by educational services, health care, and social assistance (4.1 percentage points).
- Private goods-producing industries' share of GDP fell from 39.8 percent in 1947 to 24.9 percent in 1987, mostly because of manufacturing, which declined 8.5 percentage points, and agriculture, forestry, fishing, and hunting, which declined 6.5 percentage points.
- Real value added for durable-goods manufacturing increased at nearly the same rate as real GDP in the 1947–87 period, but it contributed disproportionately to each of the post-war expansions and downturns that are studied in this article. Contributions by nondurable-goods manufacturing during these cycles were proportional to the industry group's share of the economy.
- Government's share of GDP peaked at slightly more than 15 percent in the early 1970s, reflecting continued increases in the share of state and local government, which rose from 4.1 percent in 1947 to 8.6 percent in 1972. The Federal Government's share of GDP has declined steadily since 1947.

Sector Trends

The new NAICS-based estimates allow for a better understanding of the sources of the services sector's growth as a share of the economy since World War II. In addition, the newly available value-added quantity and price indexes now make it possible to identify the separate contributions of real output growth and relative price change to the increase in the services sector's share of GDP.

Growth of services share of GDP

Based on selected 10-year periods, the largest increase in the services-producing sector's share of current-dollar GDP occurred in 1977-87, when its share increased 6.5 percentage points, from 54.7 percent to 61.2 percent (table A). Most of this increase was accounted for by finance, insurance, real estate, rental, and leasing and by professional and business services; both increased 2.7 percentage points. The increase in finance, insurance, real estate, rental, and leasing partly reflected rapid price appreciation in the real estate sector. The increase in professional and business services reflected the growth of services outsourcing, which became more prevalent in the U.S. economy as part of the restructuring that accompanied the recovery from the recessions of the early 1980s.

Not all services sector industry groups' share of GDP increased. The share of the "distributive services"

group declined from 23.1 percent in 1947 to 19.2 percent in 1987 (chart 1). The distributive services group consists of utilities, wholesale trade, retail trade, and transportation and warehousing; these industries are primarily involved with the distribution of goods from producers or importers to final users. The decline in this group's share of GDP partly reflects the decline in the share of the goods-producing sector. Shares declined for each of the distributive services industry groups except utilities.

For private services-producing industries other than distributive services industries, the share of GDP increased from 24.7 percent in 1947 to 42.0 percent in 1987 (chart 1); shares increased for each of the industry groups except "other services, except government" and "arts, entertainment, recreation, accommodation, and food services."

The historical decline in the share of goods-producing industries was mostly attributable to agriculture, forestry, and fishing and to manufacturing, but the pattern of decline differed for those two industry groups. The share of agriculture, forestry, fishing, and hunting dropped sharply from 1947 to 1967, from 8.2 percent to 2.7 percent, but thereafter it declined much more slowly. In contrast, manufacturing's share was fairly stable between 1947 and 1967 before it started declining sharply. The largest declines for manufacturing took place between 1967 and 1972 and between 1977 and 1982, periods that included recessions.

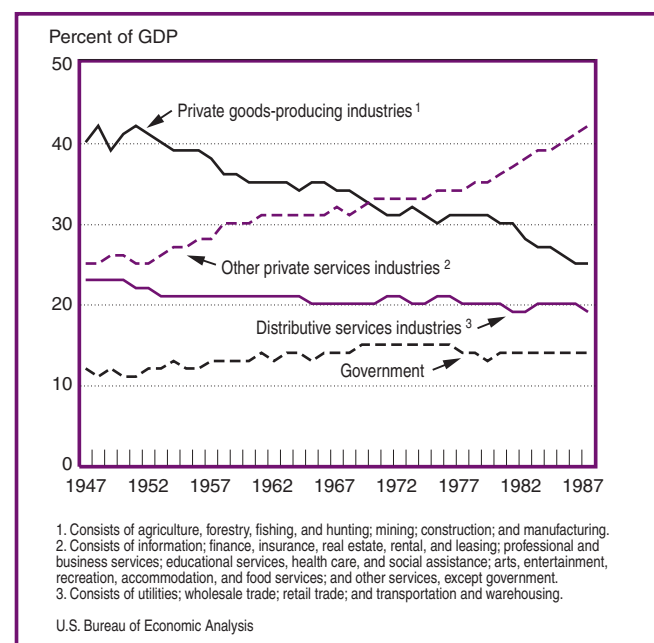
Table A. Value Added by Industry Group in Current Dollars as a Percentage of Gross Domestic Product for Selected Years

[Percent]

	1947	1957	1967	1977	1987
Gross domestic product	100.0	100.0	100.0	100.0	100.0
Private industries	87.5	87.4	85.8	85.6	86.1
Agriculture, forestry, fishing, and hunting	8.2	4.0	2.7	2.5	1.7
Mining	2.3	2.3	1.4	2.1	1.5
Utilities	1.4	1.9	2.0	2.3	2.6
Construction	3.7	4.7	4.6	4.6	4.6
Manufacturing	25.6	26.9	25.2	21.6	17.1
Durable goods	13.0	16.1	15.4	13.1	10.2
Nondurable goods	12.6	10.9	9.8	8.5	6.9
Wholesale trade	6.3	6.2	6.5	6.6	6.0
Retail trade	9.4	7.9	7.8	7.8	7.4
Transportation and warehousing	6.0	5.0	4.0	3.8	3.2
Information	2.5	2.9	3.2	3.5	3.9
Finance, insurance, real estate, rental, and leasing	10.4	13.1	14.2	15.0	17.7
Professional and business services ¹	3.7	4.5	5.3	6.0	8.7
Educational services, health care, and social assistance	1.9	2.4	3.4	4.6	6.0
Arts, entertainment, recreation, accommodation, and food services	3.2	2.7	2.8	2.9	3.2
Other services, except government	3.0	2.8	2.7	2.3	2.4
Government	12.5	12.6	14.2	14.4	13.9
Addenda:					
Private goods-producing industries ²	39.8	38.0	34.0	30.9	24.9
Private services-producing industries ³	47.8	49.4	51.8	54.7	61.2

1. Consists of professional, scientific, and technical services; management of companies and enterprises; and administrative and waste management services.
 2. Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.
 3. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

Chart 1. Shares of Current-Dollar GDP for 1947-87



1. Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.
 2. Consists of information; finance, insurance, real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.
 3. Consists of utilities; wholesale trade; retail trade; and transportation and warehousing.

U.S. Bureau of Economic Analysis

Real value added and value-added prices

The private-services sector’s growing share of current-dollar GDP reflects relatively faster growth in both real value added and value-added prices.

For 1947–87, private services industries’ real value added increased at an average annual rate of 4.0 percent, compared with 3.1 percent for goods-producing industries and 3.6 percent for real GDP (table B).

Utilities (5.4 percent) and information (5.3 percent) were the fastest growing industry groups (chart 2). None of the industry groups in the goods-producing sector increased faster than GDP. Value-added prices for private services-producing industries increased 4.2 percent, compared with 3.3 percent for private goods-producing industries and 4.0 percent for GDP (table C).

Over 10-year periods starting in 1947, real value added of private services-producing industries increased significantly faster than that of goods-producing industries in each period except 1947–57. In that period, services increased slightly less than goods because of very slow growth in transportation and warehousing (table B). The period with the largest difference in growth rates between the two broad sectors was 1967–77, when private services increased nearly 2 percentage points more than goods. Value-added prices also grew faster in services in each period except for 1967–77, when large price increases in mining and construction contributed to faster price

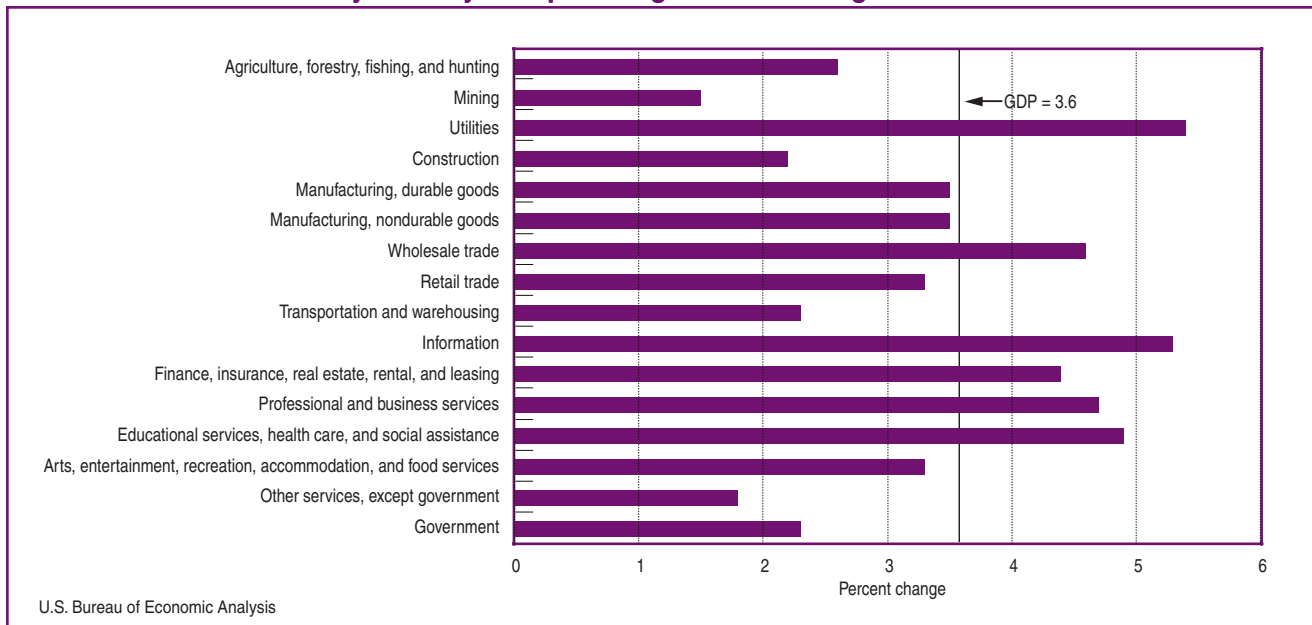
growth for goods-producing industries (table C). The largest difference in price change between the two sectors occurred in 1977–87, when services prices increased more than 2 percentage points faster than

Table B. Real Value Added by Industry Group
Average Annual Rates of Change for Selected Periods
[Percent]

	1947–87	1947–57	1957–67	1967–77	1977–87
Gross domestic product	3.6	3.9	4.2	3.1	3.1
Private industries	3.7	3.9	4.3	3.3	3.2
Agriculture, forestry, fishing, and hunting	2.6	2.1	1.9	2.2	4.4
Mining	1.5	2.1	2.0	1.5	0.6
Utilities	5.4	9.3	6.0	4.6	1.9
Construction.....	2.2	6.2	3.0	-1.6	1.1
Manufacturing	3.5	4.1	4.5	2.9	2.7
Durable goods.....	3.5	4.5	4.6	2.4	2.6
Nondurable goods.....	3.5	3.5	4.3	3.7	2.7
Wholesale trade.....	4.6	4.1	5.7	4.0	4.7
Retail trade	3.3	3.4	3.6	3.2	3.1
Transportation and warehousing.....	2.3	0.8	3.0	2.9	2.5
Information.....	5.3	4.5	5.9	5.8	4.9
Finance, insurance, real estate, rental, and leasing.....	4.4	5.3	4.7	4.4	3.4
Professional and business services ¹	4.7	3.7	5.0	4.1	5.8
Educational services, health care, and social assistance.....	4.9	4.5	5.9	5.8	3.3
Arts, entertainment, recreation, accommodation, and food services	3.3	2.6	3.6	3.4	3.5
Other services, except government	1.8	1.8	2.9	0.8	1.7
Government	2.3	2.7	3.5	1.4	1.5
Addenda:					
Private goods-producing industries ²	3.1	3.9	3.9	2.1	2.4
Private services-producing industries ³	4.0	3.8	4.6	4.0	3.7

1. Consists of professional, scientific, and technical services; management of companies and enterprises; and administrative and waste management services.
 2. Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.
 3. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

Chart 2. Real Value Added by Industry Group: Average Annual Change for 1947–87



goods prices.

Real value-added growth rates for industries can vary over long time periods as a result of both short-term developments and changes in long-term trends (chart 3). Here are some examples:

- In 1947–57, real growth was very high for utilities; it became consistently lower afterwards, as the post-war expansion of the electric utility industry slowed.
- In 1967–77, real growth in the construction industry declined, partly because of reductions in spend-

ing for new structures by state and local governments.

- In 1947–67, durable-goods manufacturing increased much faster than average, as Federal defense purchases and spending on consumer durable goods expanded but then increased much slower than average during 1967–87, a period that included the recessions of the mid-1970s and early 1980s.
- In 1957–77, educational services, health care, and social assistance increased much faster than in other periods, as health care availability increased and educational opportunities expanded, partly as the result of Federal Government programs.

(See chart 6 on page 82 for additional industry groups.)

**Table C. Value-Added Price Indexes by Industry Group
Average Annual Rates of Change for Selected Periods**
[Percent]

	1947–87	1947–57	1957–67	1967–77	1977–87
Gross domestic product	4.0	2.6	1.8	6.0	5.5
Private industries	3.8	2.6	1.5	5.8	5.5
Agriculture, forestry, fishing, and hunting	0.9	-2.8	0.3	6.0	0.1
Mining	4.9	4.4	-1.0	12.2	4.5
Utilities	3.8	1.1	0.5	5.6	8.3
Construction	6.0	2.8	2.9	11.0	7.6
Manufacturing	3.0	2.9	0.9	4.6	3.6
Durable goods	3.4	4.2	1.0	5.0	3.5
Nondurable goods	2.5	1.4	0.7	4.0	3.8
Wholesale trade	2.8	2.1	0.8	5.3	3.0
Retail trade	3.6	1.3	2.2	6.0	5.0
Transportation and warehousing	3.6	4.0	0.6	5.6	4.5
Information	3.4	3.3	1.3	4.1	4.9
Finance, insurance, real estate, rental, and leasing	4.5	3.6	2.2	5.2	7.1
Professional and business services ¹	5.1	4.7	2.6	6.5	6.7
Educational services, health care, and social assistance	5.7	4.6	3.4	6.7	8.2
Arts, entertainment, recreation, accommodation, and food services	4.3	2.2	2.6	6.2	6.2
Other services, except government	5.2	4.0	2.8	6.6	7.5
Government	5.6	3.8	3.8	7.9	6.9
Addenda:					
Private goods-producing industries ²	3.3	2.1	1.0	6.0	4.0
Private services-producing industries ³	4.2	3.0	1.9	5.7	6.1

1. Consists of professional, scientific, and technical services; management of companies and enterprises; and administrative and waste management services.
2. Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.
3. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

Expansions and Contractions

The new historical NAICS-based estimates of GDP by industry include value-added quantity indexes and price indexes that are consistent with BEA's Fisher index measures of real GDP growth and price change.

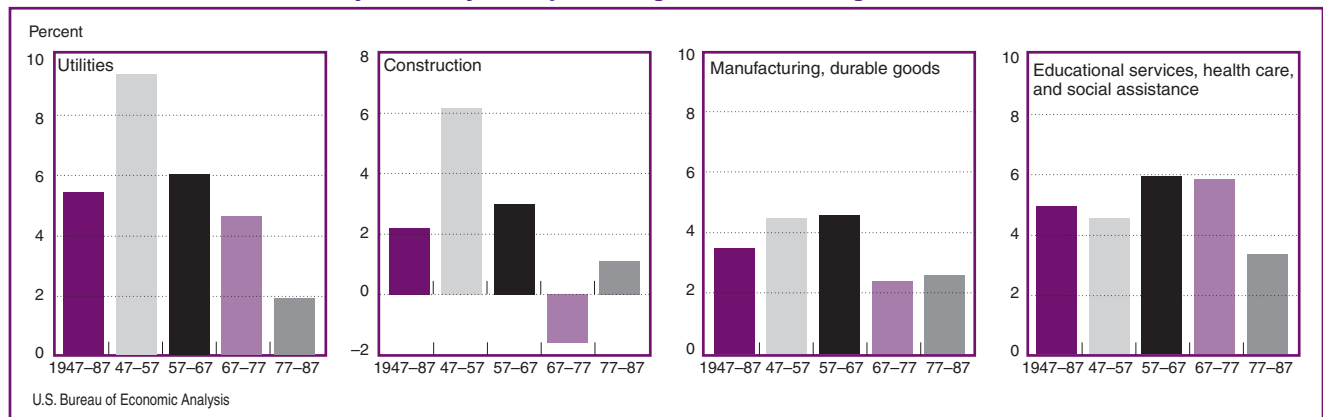
These indexes allow industry contributions to economy-wide changes to be computed for the first time using the same contributions formula that BEA uses for the national income and product accounts (NIPAs).

As a result, these NAICS-based estimates can be used to measure the contributions of industry groups to business cycle expansions, contractions, and other episodes in postwar U.S. economic history.

This section examines expansions in 1949–53, 1954–57, 1961–69, and 1982–90 and contractions in 1973–75 and 1979–82.¹ Although these periods do not necessarily coincide with the peaks and troughs of

1. Average annual growth-rate calculations do not include the first year of the period.

Chart 3. Real Value Added by Industry Group: Average Annual Change for 1947–87 and 10-Year Periods



business cycles as determined by the National Bureau of Economic Research (NBER), they correspond closely to several of the NBER cycles. NBER uses monthly data to determine business cycle peaks and troughs, but only annual data are available for the GDP-by-industry estimates.

The four expansion periods are relatively long, they include only years in which real GDP increased, and they represent different economic periods. Real GDP declined in all years of the contraction periods except for 1981. The period 1979–82 is included as a contraction period because of the decline in real value added for all private industries.

Expansions

In all expansion periods except 1949–53, private services-producing industries grew faster and contributed more to real GDP growth than private goods-producing industries. In each period, the fastest growing services sector industry differed: Utilities (6.1 percent) led the way in 1954–57, information (7.1 percent) grew the fastest in 1961–69, and professional and business services (7.2 percent) was first in 1982–90 (table D). Finance, insurance, real estate, rental, and leasing

made the largest contributions to overall growth (0.7 percentage point) in 1954–57 and 1961–69 (table E).² Professional and business services made the largest contribution in 1982–90 (0.6 percentage point).

In the 1949–53 period, which included the Korean War, goods-producing industries grew faster and contributed more to real GDP growth than services-producing industries. Durable-goods manufacturing increased the fastest (12.0 percent) and contributed the most (1.8 percentage points) to real GDP growth. Manufacturing in total contributed 2.4 percentage points to the 6.2-percent real GDP average growth rate. Utilities increased 10.1 percent but contributed only 0.2 percentage point to real GDP growth.

Despite the greater contribution of the services sector in the other expansions, durable-goods manufacturing made significant contributions, especially in 1961–69, when it contributed 1.1 percentage points to real GDP growth, the largest contribution by any single industry group.

2. An industry's contribution to real GDP growth reflects both the growth rate of its real value added and its share of current-dollar GDP.

Table D. Real Value Added by Industry Group
Average Annual Rates of Change for Expansions and Contractions
[Percent]

	Expansions				Contractions	
	1949–53	1954–57	1961–69	1982–90	1973–75	1979–82
Gross domestic product	6.2	3.7	4.9	4.0	-0.3	0.1
Private industries	6.0	4.1	5.1	4.2	-0.6	-0.1
Agriculture, forestry, fishing, and hunting	2.3	-0.5	1.3	2.2	6.5	9.0
Mining	5.4	5.0	3.6	1.4	-1.4	2.7
Utilities	10.1	6.1	6.1	6.6	4.1	-2.5
Construction	7.7	4.1	1.4	4.8	-6.6	-9.9
Manufacturing	8.9	3.6	6.3	4.1	-5.7	-2.7
Durable goods	12.0	3.7	7.1	5.1	-6.7	-4.4
Nondurable goods	5.2	3.4	5.1	2.5	-4.3	-0.2
Wholesale trade	5.1	5.5	5.8	3.9	0.6	1.8
Retail trade	4.0	3.5	4.3	5.2	-1.7	-0.6
Transportation and warehousing	4.4	3.9	5.0	4.5	-3.0	-3.1
Information	4.7	4.9	7.1	4.3	3.4	3.7
Finance, insurance, real estate, rental, and leasing	5.9	5.6	4.9	2.9	5.0	2.5
Professional and business services ¹	5.2	4.9	5.7	7.2	-0.7	1.6
Educational services, health care, and social assistance	4.3	4.2	6.4	3.0	5.1	2.9
Arts, entertainment, recreation, accommodation, and food services	3.1	3.7	3.9	4.0	-0.8	1.3
Other services, except government	1.1	4.4	2.5	4.0	-1.8	-3.0
Government	7.0	1.4	4.0	2.0	1.9	0.7
Addenda:						
Private goods-producing industries ²	7.5	3.2	5.0	3.8	-4.3	-2.5
Private services-producing industries ³	4.8	4.8	5.1	4.3	1.6	1.1

1. Consists of professional, scientific, and technical services; management of companies and enterprises; and administrative and waste management services.

2. Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.

3. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

Table E. Contributions to Percent Change in Real GDP by Industry Group
Average Annual Rates of Change for Expansions and Contractions
[Percent]

	Expansions				Contractions	
	1949–53	1954–57	1961–69	1982–90	1973–75	1979–82
Percent change:						
Gross domestic product	6.2	3.7	4.9	4.0	-0.3	0.1
Percentage points:						
Private industries	5.33	3.61	4.38	3.59	-0.55	-0.09
Agriculture, forestry, fishing, and hunting	0.15	-0.01	0.04	0.04	0.20	0.20
Mining	0.14	0.12	0.06	0.02	-0.02	0.06
Utilities	0.16	0.11	0.13	0.16	0.08	-0.05
Construction	0.34	0.19	0.07	0.20	-0.33	-0.45
Manufacturing	2.39	0.99	1.58	0.73	-1.24	-0.53
Durable goods	1.76	0.59	1.06	0.54	-0.87	-0.52
Nondurable goods	0.63	0.40	0.52	0.19	-0.37	-0.01
Wholesale trade	0.32	0.33	0.37	0.25	0.04	0.12
Retail trade	0.35	0.29	0.34	0.38	-0.14	-0.05
Transportation and warehousing	0.26	0.20	0.21	0.14	-0.11	-0.11
Information	0.13	0.14	0.22	0.17	0.11	0.13
Finance, insurance, real estate, rental, and leasing	0.68	0.72	0.70	0.52	0.73	0.38
Professional and business services ¹	0.21	0.21	0.29	0.59	-0.04	0.11
Educational services, health care, and social assistance	0.09	0.10	0.20	0.18	0.22	0.14
Arts, entertainment, recreation, accommodation, and food services	0.09	0.10	0.11	0.13	-0.02	0.04
Other services, except government	0.03	0.12	0.07	0.09	-0.04	-0.07
Government	0.79	0.17	0.55	0.28	0.28	0.10
Addenda:						
Private goods-producing industries ²	3.02	1.28	1.75	0.99	-1.38	-0.73
Private services-producing industries ³	2.32	2.32	2.63	2.60	0.83	0.64

1. Consists of professional, scientific, and technical services; management of companies and enterprises; and administrative and waste management services.

2. Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.

3. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

Contractions

In contrast to the expansion periods, both contraction periods were characterized by significant declines in the private goods-producing sector and by modest increases in the private services-producing sector and in government.

In 1973–75, private goods-producing industries declined at an average annual rate of 4.3 percent, led by declines in durable-goods manufacturing (6.7 percent) and construction (6.6 percent). Durable-goods manufacturing contributed –0.9 percentage point to the 0.3-percent average annual decline in real GDP during this period. The real GDP decline was tempered by a contribution of 0.7 percentage point by finance, insurance, real estate, rental, and leasing.

The 1979–82 period is included as a contraction period because private industries overall declined at an average annual rate of 0.1 percent during this period. As in the earlier period, private goods-producing industries declined (2.5 percent), while private services-producing industries increased (1.1 percent). Construction declined the most (9.9 percent) followed by durable-goods manufacturing (4.4 percent). Both construction and durable-goods manufacturing contributed –0.5 percentage point to the overall change. Finance, insurance, real estate, rental, and leasing again helped to keep the downturn relatively mild.

Appendix: Methodology for Revised Estimates

This article presents revised estimates of current-dollar and real value added for 65 industries for 1977–86 and for 22 industry groups for 1947–76. These revised estimates are based on the 1997 North American Industry Classification System (NAICS) and on the same industry definitions that were used for the revised GDP-by-industry estimates for 1987–97.³ However, the methodology used to prepare the estimates differs, especially for the real estimates, primarily because of source data limitations. In addition, estimates of gross output, intermediate inputs, and the components of value added are not provided for 1947–86.

3. For information about the methodology used for these estimates, see Robert E. Yuskavage and Yvon H. Pho, "Gross Domestic Product by Industry for 1987–2000," *SURVEY OF CURRENT BUSINESS* 84 (November 2004): 39–41.

Current-dollar estimates

The 1947–86 current-dollar estimates for each of the 60 NAICS-based private nonfarm industries were derived by extrapolating the published 1987 NAICS levels for current-dollar value added. The estimates for farms and for the four government industries were obtained from previous estimates based on the Standard Industrial Classification (SIC); the NAICS definitions of these sectors are the same. Current-dollar value added for "all industries" was constrained to equal current-dollar GDP for each year.

For the 60 private nonfarm industries, the series that were used to extrapolate the 1987 NAICS-based estimates were derived by converting SIC-based industry estimates for 1947–87 to a NAICS basis. The SIC-based estimates were released as part of the comprehensive revision of the annual industry accounts in June 2004.

For the 60 private nonfarm SIC-based industries, annual "conversion matrices" were developed that show the percentage of the revised SIC-based value-added estimate that should be allocated to each of the NAICS-based industries. Using the converted SIC series to develop extrapolators allowed the annual NAICS-based estimates to capture definitional revisions from the national income and product accounts that were incorporated in the revised SIC-based estimates and to capture special features of the estimates that stem from BEA definitions and concepts.

Also, the revised SIC-based estimates for 1947–86 are based on the 1972 SIC system. (The estimates for 1987 are available on both the 1972 SIC basis and the 1987 SIC basis.) As a result, the conversion matrix for 1987 that had been developed for preparing the estimates for 1987–97 was first adjusted to the 1972 SIC basis. In order to allow for changes over time in the NAICS composition of SIC industries, the 1987 value-added estimate for each of the detailed private industries in the conversion matrix was extrapolated for each year back to 1977, using matching, detailed SIC-based series for shipments, sales, and receipts. The conversion matrix was then held constant for years before 1977 because of the limited availability of SIC-based source data for extrapolation, especially in the nonmanufacturing sector.

Real estimates

Real estimates (chain-type quantity indexes) of value added were prepared for each of the 65 detailed industries and for related industry groups and aggregates, including private industries and “all industries.” Real value-added estimates were computed using a single-deflation method after first converting SIC-based value-added price indexes to NAICS-based price indexes using the same set of annual conversion matrices that were used to convert the current-dollar value-added estimates.⁴ (See the box “Interpreting the Value-Added Price Index.”) This procedure computes the value-added price index relative for each NAICS industry as a weighted average of the value-added price index relatives for each of the SIC industries that contribute to the NAICS industry. The weights, which are obtained from the annual conversion matrices, represent the share of a NAICS industry’s current-dollar value added that is accounted for by a specific SIC industry.

4. Single-deflation is an alternative deflation method recommended by international statistical organizations when the data needed for the preferred double-deflation method are not available. With double deflation, real value added is computed as the difference between real gross output and real intermediate inputs. This method thus requires separate deflators for gross output and for intermediate inputs.

For more information, see the technical note on computing chain-type price and quantity indexes in the GDP-by-industry accounts in Brian C. Moyer, Mark A. Planting, Mahnaz Fahim-Nader, and Sherlene K.S. Lum, “Preview of the Comprehensive Revision of the Annual Industry Accounts,” SURVEY 84 (March 2004): 50–51.

Data Availability

The GDP-by-industry estimates for 1947–86 are also available on BEA’s Web site; go to <www.bea.gov>, and under “Industry,” click on “GDP by Industry.” The GDP-by-industry estimates are available interactively on our Web site, so users can customize the tables to view data only for the industries and for the years of interest. Users can also graph data and download tables to update spreadsheets.

The following equation describes how the weighted-average value-added price index relative for period $t-1$ to t was computed for each private nonfarm NAICS industry:

$$\left(\frac{VA_t^P}{VA_{t-1}^P} \right)_n = \sum_{s=1}^{60} w_{ns} \left(\frac{VA_t^P}{VA_{t-1}^P} \right)_s$$

where $w_{ns} = VA_{ns}^{PQ} / \sum_{s=1}^{60} VA_{ns}^{PQ}$ for each $n = 1, \dots, 60$, and VA_t^P represents an industry’s value-added price index for period t , VA^{PQ} represents an industry’s current-dollar value added, n represents a NAICS industry, s represents an SIC industry, and ns represents a cell in the current-dollar value-added conversion matrix.

The SIC-based value-added price indexes for 1977–87 are the revised indexes that were released in June 2004 as part of the comprehensive revision of the annual industry accounts. The SIC-based value-added price indexes for 1947–76 were calculated from previously published SIC-based industry estimates that were last updated in July 1988 before the introduction in 1991 of changes in methodology for real value-added estimates. The published NAICS-based chain-type quantity indexes for 1987 were extrapolated (chained) back to 1947 using the value-added quantity relatives computed from the current-dollar values and price indexes.

1977–87. For this period, the weighted-average value-added price index used for deflation at the detailed industry level is a Fisher-type index for which the current-dollar value-added weights (w_{ns}) were obtained directly from the conversion matrices for both the current year and the prior year. Because the revised SIC-based price indexes used in the calculation for this period are also Fisher indexes, the resulting weighted averages can be viewed as “Fisher of Fisher” type indexes. Estimates for industry groups and for aggregates, including private industries and “all industries,” were likewise based on Fisher aggregation techniques.

Interpreting the Value-Added Price Index

The real value-added estimates for 1947–86 presented in this article are quantity indexes calculated by dividing current-dollar (nominal) value added by an estimated value-added price index. This “single-deflation” method differs from the double-deflation method that was used for the NAICS estimates for 1987–97 and that is regularly used to estimate real value added by industry in the Bureau of Economic Analysis (BEA) annual industry accounts. The quantity indexes and real growth rates obtained by these two methods are similar when the value-added price index used in the single-deflation method closely approximates the implied value-added price index obtained by the double-deflation method. This note explains why the estimates obtained using these two methods can differ by describing the properties of the value-added price index and how it differs from price indexes for gross output or intermediate inputs.

Value added in the industry accounts represents the returns to the primary inputs of labor and capital that are combined with secondary, or intermediate, inputs to produce an industry’s gross output.¹ Value added is defined as the difference between gross output (mainly sales) and intermediate inputs (purchases of energy, materials, and services). Returns to labor are approximated by the compensation of employees. Pretax returns to capital are approximated by adding together the gross operating surplus and taxes on production and imports, less subsidies.² The gross operating surplus includes both the normal (expected) returns to capital and the excess (unexpected) gains or losses attributable to factors such as demand shifts, nonconstant returns to scale, and changes in capacity utilization.

Unlike current-dollar gross output and intermediate inputs, which consist of goods and services exchanged in markets with largely observable prices, current-dollar value added is a residual measure that does not have observable price or quantity characteristics. For productivity analysis, procedures have been developed to estimate the quantities and the implied prices of labor and of capital services. A decomposition of the return to labor into quantity and price components is fairly straightforward because labor hours are observable and adjustments can be made for changes in the composition

of the workforce. The procedures designed to estimate the flow of real capital services and the implied rental prices of capital, however, are more complex and usually depend on assumptions such as market equilibrium and constant returns to scale. Departures from these assumptions, such as disequilibrium resulting from unexpected shifts in demand, can result in measures of gross operating surplus that include excess gains or losses. These current-dollar measures can thus differ from the quantity of capital services valued at normal, or expected, prices.

Excess gains or losses have a direct effect on the value-added price index when they arise from gross output prices rising faster or slower than intermediate input prices. However, when excess gains or losses arise from changes in quantities, they do not greatly affect the value-added price index because both current-dollar value added and real value added change at similar rates. Changes in multifactor productivity, the combined productivity of all inputs, can also affect the value-added price index by changing unit production costs, but market factors determine whether these cost changes translate into changes in profit margins, gross output prices, or returns to labor.³

When the double-deflation method is used to calculate the value-added quantity index, the implied value-added price index accurately reflects changes in the prices of labor and capital (value-added) inputs and changes in the profit margin, regardless of its source. Single deflation approximates the result that would be obtained by double deflation when the prices for an industry’s gross output increase or decrease at about the same rate as the prices for its intermediate inputs. Research has demonstrated that this condition often holds for many industries, though it may break down during periods of business cycle fluctuations, sharp changes in raw materials prices, or productivity shifts. When input and output prices behave differently, single-deflation methods that use a value-added price index that itself was calculated using a double-deflation method, such as the price indexes used for many of these industry estimates, can still provide an acceptable approximation to the correct result.

1. Value added also includes returns to land, which is an important factor of production in certain industries.

2. One reason that these components are just approximations to returns to labor and capital is that the proprietor’s income component of gross operating surplus includes returns to the labor of owners of unincorporated businesses.

3. The effect of multifactor productivity (MFP) growth on the value-added quantity index is captured using the double-deflation method. Growth in real gross output is the combined effect of growth in primary inputs, secondary inputs, and the productivity of all inputs. Subtracting real intermediate input growth from real gross output growth leaves the combined effects of value-added input growth and MFP growth in the residual value-added quantity index.

The revised SIC-based value-added price indexes were based on the double-deflation method for most of the industries. This procedure works well for those NAICS industries that are exact (“one-to-one”), or nearly exact, matches with the contributing SIC industry.

Exceptions to this procedure were made for certain high-tech manufacturing industries, based on comparisons with the Federal Reserve Board’s NAICS-based index of industrial production for manufacturing industries.⁵ These industries include computer and electronic products manufacturing, machinery manufacturing, and electrical equipment and appliances. For these industries, a proxy gross-output price index was first computed for the NAICS industry for 1977–87 based on underlying source data, and then the value-added price index was imputed based on the relationship between the value-added price index and the gross output price index for 1987–97, when value-added price indexes for NAICS industries were based on the double-deflation method. This alternative method was also used for the utilities industry.

1947–76. For this period, the weighted-average value-added price index used for deflation at the detailed industry level is a fixed-weight index in which the current-dollar value-added weights were obtained from the 1977 conversion matrix. Estimates for industry groups and aggregates, including private industries

5. For information about the most recent historical revision of the industrial production index, see Carol Corrado, “Industrial Production and Capacity Utilization: The 2002 Historical and Annual Revision,” *Federal Reserve Bulletin* 89 (April 2003): 151–176.

Acknowledgments

Robert E. Yuskavage, senior economist in the Office of the Associate Director for Industry Accounts, developed the methodology and supervised the preparation of the estimates. Sumiye Okubo, Associate Director for Industry Accounts, and Ann M. Lawson, Chief of the Current Industry Analysis Division (CIAD), provided overall guidance. Mahnaz Fahim-Nader of the Industry Benchmark Division prepared the estimates, with significant contributions from Erich H. Strassner and Thomas F. Howells, both of CIAD.

and “all industries,” were based on Fisher aggregation techniques. The SIC-based price indexes for this period were computed as implicit price deflators using current-dollar and constant-dollar (1982) value-added-by-industry data that were last published by BEA in July 1988.⁶ The constant-dollar estimates used to calculate the implicit price deflator were based on the double-deflation method for all manufacturing industries except petroleum and coal products, railroads, and electric and gas utilities. Constant-dollar estimates for the other industries were based on either single deflation or quantity extrapolation.

For some SIC industries with constant-dollar estimates that were based on quantity extrapolation, revised implicit price deflators were computed using the most recent current-dollar value-added data (from June 2004) because the original constant-dollar estimate was not subject to revision. Value-added price indexes for the NAICS computer and electronic products industry were adjusted for 1972–77 using Census Bureau shipments and materials data and BLS price indexes for the four-digit SIC industries that compose the NAICS industry.

Evaluating the results

The methodology was evaluated for reasonableness and consistency primarily by comparison with related estimates, including real GDP from the NIPAs. Comparisons were made with both the revised and the previously published SIC-based estimates for aggregates and for more detailed industry groups whose definitions were not significantly affected by the conversion to NAICS.

Current-dollar estimates. As expected, the share of GDP for goods-producing industries is similar to, but slightly lower, under NAICS than under the SIC over the entire period (chart 4). The converse is true for private services-producing industries. The NAICS-based estimates also show the long-term decline in goods-producing industries’ share of GDP that was seen in

6. These estimates were recently used in a similar manner to study SIC-based industry sources of productivity change before 1977. See William D. Nordhaus, “Retrospective on the 1970s Productivity Slowdown,” *National Bureau of Economic Research* (working paper no. 10950, December 2004).

the SIC-based estimates.

The conversion matrix shares that were used to allocate SIC-based industry estimates to NAICS industries were held constant for years before 1977. However, because allocations to more than one detailed NAICS industry from a single SIC industry usually fell within the same higher level NAICS industry group, errors in the allocation matrix tended to cancel one another at the industry group level.

Real estimates. Because the previously published

real estimates for years before 1977 were based on fixed 1982 relative price weights, they are subject to substitution bias for earlier years that are far from 1982. However, the Fisher aggregation procedures that were used to prepare the quantity indexes for NAICS industry groups for 1947–76 reduced the impact of the substitution bias. For example, real value-added estimates for the manufacturing industry group for 1947–76 are not affected by substitution bias to the same degree as the estimates for specific manufacturing industries.

In addition, the aggregation of the NAICS-based estimates over “all industries” yields an estimate that closely matches BEA’s measure of real GDP growth (chart 5). The correlation is much closer than it was using the previously published constant 1982 dollar SIC-based estimates. This closer correspondence indicates greater consistency of the industry real value added estimates with real GDP.

Chart 4. Private Industries’ Share of GDP, 1947–87

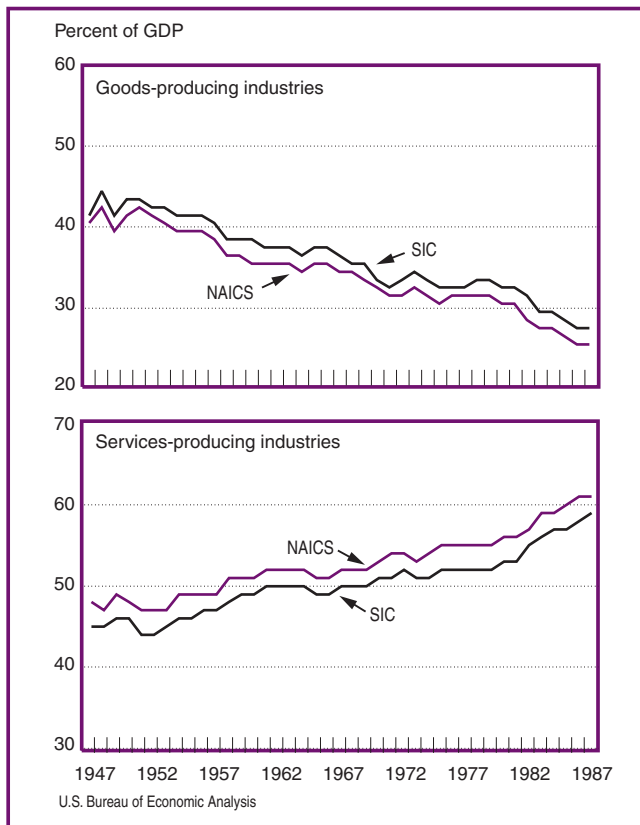


Chart 5. Value-Added Quantity Indexes, 1947–87

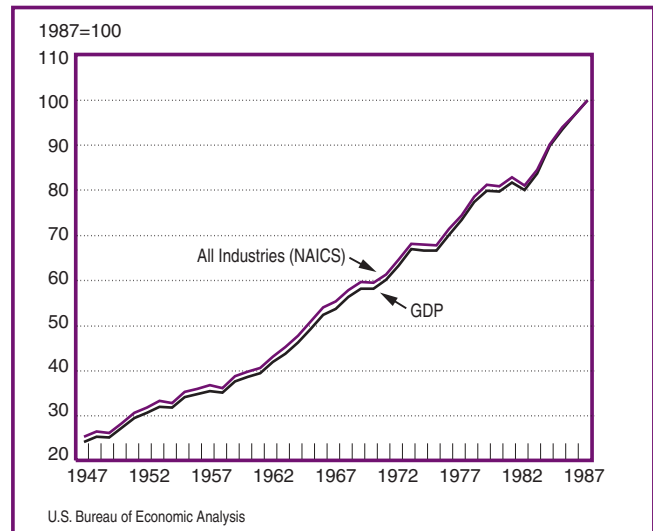


Chart 6 and tables 1–4 follow.

Chart 6. Real Value Added by Industry Group: Average Annual Change for 1947–87 and 10-Year Periods

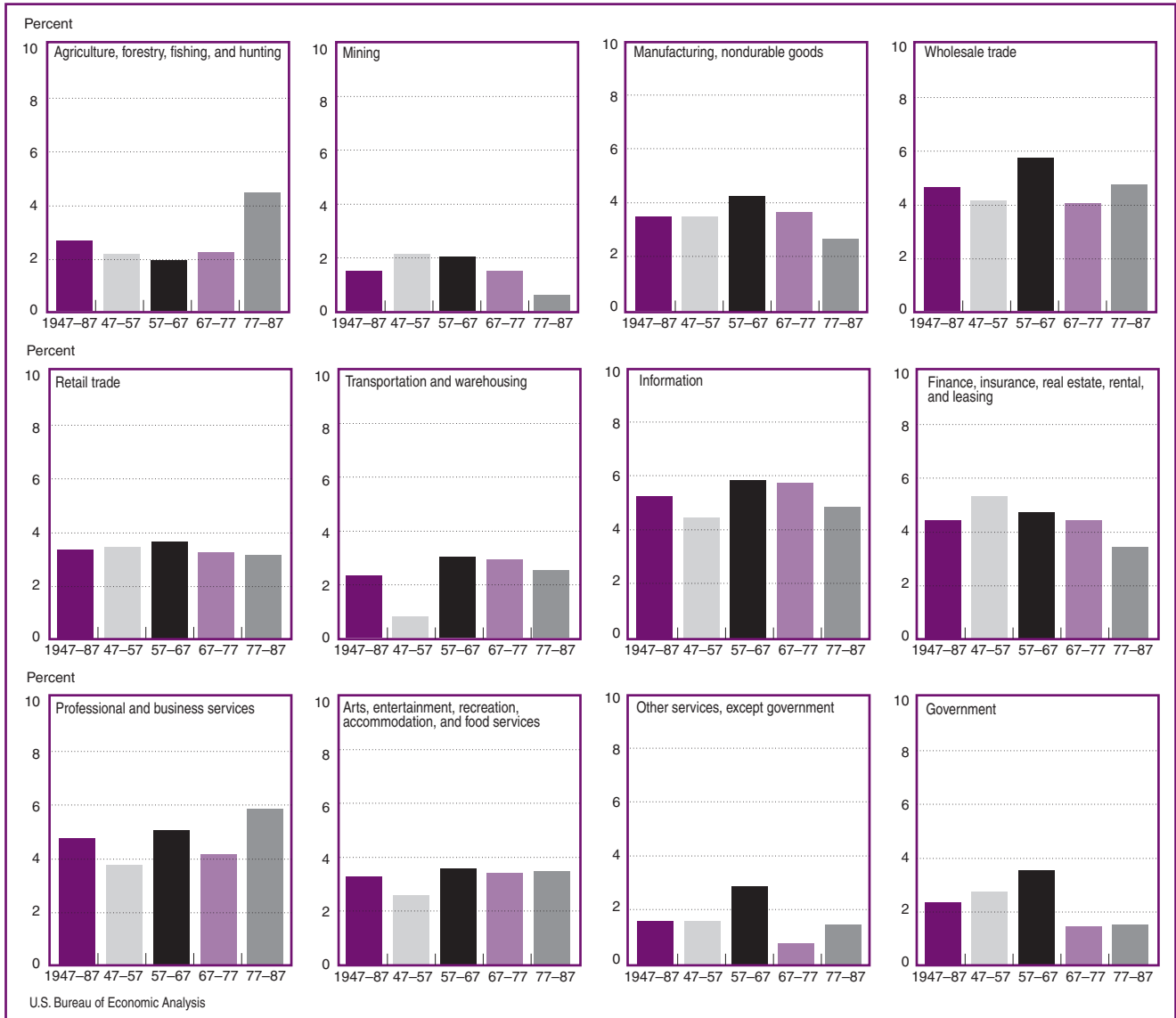


Table 1. Value Added by Industry Group for Selected Years

[Billions of dollars]

Line		1947	1952	1957	1962	1967	1972	1977	1982	1987
1	Gross domestic product	244.2	358.3	461.1	585.6	832.6	1,238.3	2,030.9	3,255.0	4,739.5
2	Private industries	213.7	313.8	403.0	506.8	714.2	1,051.0	1,739.4	2,792.6	4,080.4
3	Agriculture, forestry, fishing, and hunting.....	19.9	22.1	18.4	20.4	22.9	34.4	51.3	71.3	79.8
4	Mining.....	5.7	8.2	10.8	10.2	11.9	15.8	43.4	120.0	71.5
5	Utilities.....	3.3	5.9	9.0	12.9	16.9	26.1	45.9	81.7	123.0
6	Construction.....	9.0	16.6	21.5	26.2	38.7	61.0	94.2	128.8	218.2
7	Manufacturing.....	62.5	98.3	124.2	147.3	209.4	273.7	438.6	603.2	811.3
8	Durable goods.....	31.7	56.3	74.1	86.9	128.0	164.1	265.0	353.4	483.8
9	Nondurable goods.....	30.8	42.0	50.2	60.4	81.5	109.6	173.6	249.8	327.5
10	Wholesale trade.....	15.5	21.5	28.5	38.5	54.1	82.0	134.9	207.9	285.3
11	Retail trade.....	22.9	29.7	36.4	45.5	64.7	98.1	158.5	229.9	349.9
12	Transportation and warehousing.....	14.6	20.3	23.3	25.1	33.1	48.4	76.2	105.9	151.1
13	Information.....	6.2	9.6	13.2	18.1	26.9	42.6	71.1	123.6	185.0
14	Finance, insurance, real estate, rental, and leasing.....	25.4	41.0	60.5	84.2	118.1	184.9	304.0	539.9	840.3
15	Finance and insurance.....	5.7	10.0	15.1	20.5	31.3	51.5	92.3	167.6	274.4
16	Real estate and rental and leasing.....	19.8	31.0	45.3	63.7	86.8	133.4	211.7	372.3	565.9
17	Professional and business services.....	9.1	14.3	20.8	28.6	44.0	67.5	122.7	230.9	414.1
18	Professional, scientific, and technical services.....	3.6	5.9	9.3	13.5	21.8	34.8	64.5	130.0	238.6
19	Management of companies and enterprises.....	4.0	6.1	7.8	9.8	13.8	19.4	32.7	52.1	81.3
20	Administrative and waste management services.....	1.4	2.3	3.6	5.3	8.4	13.3	25.5	48.8	94.1
21	Educational services, health care, and social assistance.....	4.6	7.2	11.2	16.9	28.0	51.1	93.8	177.9	286.5
22	Educational services.....	0.8	1.2	1.8	2.9	4.9	9.3	12.7	20.7	32.7
23	Health care and social assistance.....	3.8	6.0	9.4	14.0	23.1	41.8	81.1	157.2	253.7
24	Arts, entertainment, recreation, accommodation, and food services.....	7.8	10.0	12.5	16.1	23.1	34.6	58.8	100.9	152.1
25	Arts, entertainment, and recreation.....	1.5	1.9	2.5	3.6	4.9	6.8	12.8	20.4	31.6
26	Accommodation and food services.....	6.3	8.1	10.0	12.4	18.2	27.8	45.9	80.5	120.5
27	Other services, except government.....	7.2	9.3	12.7	16.7	22.5	30.8	46.1	70.7	112.3
28	Government	30.4	44.5	58.1	78.8	118.4	187.3	291.5	462.4	659.1
29	Federal.....	20.4	28.0	32.6	40.2	56.9	80.5	116.2	186.2	257.8
30	State and local.....	10.0	16.5	25.5	38.6	61.5	106.8	175.4	276.2	401.3
	Addenda:									
31	Private goods-producing industries ¹	97.1	145.2	175.0	204.1	282.9	384.8	627.5	923.3	1,180.8
32	Private services-producing industries ²	116.6	168.7	228.0	302.7	431.2	666.1	1,111.9	1,869.3	2,899.5

1. Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.

2. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational

services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

Table 2. Value Added by Industry Group as a Percentage of Current-Dollar Gross Domestic Product for Selected Years
[Percent]

Line	1947	1952	1957	1962	1967	1972	1977	1982	1987
1	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2	87.5	87.6	87.4	86.5	85.8	84.9	85.6	85.8	86.1
3	8.2	6.2	4.0	3.5	2.7	2.8	2.5	2.2	1.7
4	2.3	2.3	2.3	1.7	1.4	1.3	2.1	3.7	1.5
5	1.4	1.6	1.9	2.2	2.0	2.1	2.3	2.5	2.6
6	3.7	4.6	4.7	4.5	4.6	4.9	4.6	4.0	4.6
7	25.6	27.4	26.9	25.2	25.2	22.1	21.6	18.5	17.1
8	13.0	15.7	16.1	14.8	15.4	13.3	13.1	10.9	10.2
9	12.6	11.7	10.9	10.3	9.8	8.9	8.5	7.7	6.9
10	6.3	6.0	6.2	6.6	6.5	6.6	6.6	6.4	6.0
11	9.4	8.3	7.9	7.8	7.8	7.9	7.8	7.1	7.4
12	6.0	5.7	5.0	4.3	4.0	3.9	3.8	3.3	3.2
13	2.5	2.7	2.9	3.1	3.2	3.4	3.5	3.8	3.9
14	10.4	11.4	13.1	14.4	14.2	14.9	15.0	16.6	17.7
15	2.3	2.8	3.3	3.5	3.8	4.2	4.5	5.2	5.8
16	8.1	8.6	9.8	10.9	10.4	10.8	10.4	11.4	11.9
17	3.7	4.0	4.5	4.9	5.3	5.5	6.0	7.1	8.7
18	1.5	1.6	2.0	2.3	2.6	2.8	3.2	4.0	5.0
19	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.6	1.7
20	0.6	0.6	0.8	0.9	1.0	1.1	1.3	1.5	2.0
21	1.9	2.0	2.4	2.9	3.4	4.1	4.6	5.5	6.0
22	0.3	0.3	0.4	0.5	0.6	0.8	0.6	0.6	0.7
23	1.6	1.7	2.0	2.4	2.8	3.4	4.0	4.8	5.4
24	3.2	2.8	2.7	2.7	2.8	2.8	2.9	3.1	3.2
25	0.6	0.5	0.5	0.6	0.6	0.5	0.6	0.6	0.7
26	2.6	2.3	2.2	2.1	2.2	2.2	2.3	2.5	2.5
27	3.0	2.6	2.8	2.9	2.7	2.5	2.3	2.2	2.4
28	12.5	12.4	12.6	13.5	14.2	15.1	14.4	14.2	13.9
29	8.4	7.8	7.1	6.9	6.8	6.5	5.7	5.7	5.4
30	4.1	4.6	5.5	6.6	7.4	8.6	8.6	8.5	8.5
Addenda:									
31	39.8	40.5	38.0	34.9	34.0	31.1	30.9	28.4	24.9
32	47.8	47.1	49.4	51.7	51.8	53.8	54.7	57.4	61.2

1. Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.
2. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational

services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

Table 3. Real Value Added by Industry Group
Average Annual Rates of Change for Selected Periods

[Percent]

Line		1947-52	1952-57	1957-62	1962-67	1967-72	1972-77	1977-82	1982-87
1	Gross domestic product	4.8	3.0	3.4	5.1	3.3	3.0	1.8	4.5
2	Private industries	4.6	3.2	3.3	5.2	3.4	3.2	1.8	4.7
3	Agriculture, forestry, fishing, and hunting.....	2.9	1.2	1.4	2.4	1.8	2.7	6.3	2.6
4	Mining.....	1.3	2.9	0.2	3.9	1.4	1.6	0.0	1.2
5	Utilities.....	11.3	7.3	6.3	5.7	5.7	3.6	-3.3	7.4
6	Construction.....	8.6	4.0	3.9	2.2	-2.8	-0.3	-4.3	6.8
7	Manufacturing.....	6.1	2.1	2.4	6.6	2.7	3.2	0.0	5.4
8	Durable goods.....	7.3	1.8	1.6	7.6	1.8	3.1	-1.1	6.5
9	Nondurable goods.....	4.6	2.5	3.5	5.1	4.1	3.3	1.8	3.6
10	Wholesale trade.....	4.3	3.9	5.7	5.8	5.4	2.7	4.6	4.7
11	Retail trade.....	3.7	3.1	2.7	4.5	3.6	2.8	0.8	5.5
12	Transportation and warehousing.....	0.4	1.1	0.8	5.2	3.3	2.5	0.2	4.9
13	Information.....	4.7	4.4	4.6	7.3	6.4	5.2	6.0	3.7
14	Finance, insurance, real estate, rental, and leasing.....	5.2	5.4	5.0	4.4	5.1	3.8	3.8	3.0
15	Finance and insurance.....	4.1	5.3	2.6	3.8	4.9	4.4	5.1	2.8
16	Real estate and rental and leasing.....	5.5	5.5	5.7	4.5	5.1	3.6	3.2	3.0
17	Professional and business services.....	3.8	3.6	4.1	6.0	4.1	4.1	3.9	7.8
18	Professional, scientific, and technical services.....	2.8	4.0	4.3	6.2	4.1	4.4	5.1	7.2
19	Management of companies and enterprises.....	4.6	2.8	3.2	5.6	3.6	3.1	0.8	6.9
20	Administrative and waste management services.....	4.3	4.6	5.4	6.0	4.8	4.5	4.8	9.9
21	Educational services, health care, and social assistance.....	4.3	4.6	5.8	6.1	6.2	5.5	3.5	3.1
22	Educational services.....	3.6	3.2	4.5	5.2	3.9	2.0	1.4	4.1
23	Health care and social assistance.....	4.5	4.8	6.1	6.2	6.7	6.1	3.8	3.0
24	Arts, entertainment, recreation, accommodation, and food services.....	2.2	3.0	2.8	4.3	3.0	3.8	2.7	4.3
25	Arts, entertainment, and recreation.....	0.5	2.3	4.0	2.7	1.8	6.9	4.0	4.7
26	Accommodation and food services.....	2.6	3.1	2.5	4.8	3.3	3.1	2.4	4.2
27	Other services, except government.....	1.0	2.6	2.9	3.0	1.0	0.6	-0.6	4.0
28	Government	4.4	1.1	2.7	4.3	1.5	1.3	1.2	1.8
29	Federal.....	5.5	-1.1	1.1	3.4	-1.8	-0.6	0.9	2.0
30	State and local.....	2.8	4.4	4.6	5.3	4.3	2.7	1.3	1.6
	Addenda:								
31	Private goods-producing industries ¹	5.5	2.3	2.4	5.5	1.7	2.6	-0.1	4.9
32	Private services-producing industries ²	3.8	3.9	4.1	5.0	4.5	3.5	2.9	4.6

1. Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.

2. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational

services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

**Table 4. Value-Added Price Indexes by Industry Group
Average Annual Rates of Change for Selected Periods**

[Percent]

Line		1947-52	1952-57	1957-62	1962-67	1967-72	1972-77	1977-82	1982-87
1	Gross domestic product	3.1	2.1	1.5	2.1	4.8	7.2	8.0	3.1
2	Private industries	3.3	1.9	1.3	1.8	4.4	7.2	8.0	3.1
3	Agriculture, forestry, fishing, and hunting.....	-0.7	-4.8	0.7	-0.1	6.6	5.5	0.5	-0.3
4	Mining.....	6.0	2.8	-1.3	-0.8	4.4	20.6	22.5	-10.9
5	Utilities.....	0.8	1.3	1.3	-0.2	3.2	8.0	16.0	1.1
6	Construction.....	4.2	1.3	0.1	5.8	12.7	9.4	11.2	4.1
7	Manufacturing.....	3.2	2.7	1.0	0.7	2.7	6.5	6.6	0.7
8	Durable goods.....	4.6	3.8	1.6	0.4	3.3	6.7	7.1	0.0
9	Nondurable goods.....	1.7	1.1	0.3	1.1	1.9	6.2	5.7	1.8
10	Wholesale trade.....	2.4	1.9	0.4	1.2	3.1	7.6	4.2	1.7
11	Retail trade.....	1.6	1.0	1.8	2.7	5.0	7.1	6.9	3.1
12	Transportation and warehousing.....	6.4	1.6	0.8	0.4	4.5	6.8	6.6	2.3
13	Information.....	4.3	2.2	1.8	0.9	3.0	5.3	5.3	4.5
14	Finance, insurance, real estate, rental, and leasing.....	4.6	2.5	1.8	2.5	4.1	6.4	8.1	6.1
15	Finance and insurance.....	7.7	3.1	3.5	4.9	5.3	7.7	7.2	7.4
16	Real estate and rental and leasing.....	3.7	2.3	1.2	1.8	3.7	5.9	8.5	5.5
17	Professional and business services.....	5.5	4.0	2.4	2.8	4.6	8.3	9.2	4.3
18	Professional, scientific, and technical services.....	7.2	5.3	3.3	3.6	5.4	8.4	9.5	5.3
19	Management of companies and enterprises.....	3.7	2.3	1.2	1.4	3.3	7.7	8.9	2.3
20	Administrative and waste management services.....	6.1	4.5	2.5	3.3	4.7	8.9	8.7	3.8
21	Educational services, health care, and social assistance.....	4.7	4.6	2.6	4.2	6.3	7.1	9.8	6.7
22	Educational services.....	4.9	5.5	5.3	5.6	9.5	4.3	8.8	5.3
23	Health care and social assistance.....	4.6	4.4	2.1	4.0	5.6	7.6	9.9	6.9
24	Arts, entertainment, recreation, accommodation, and food services.....	2.8	1.6	2.3	3.0	5.3	7.0	8.4	4.1
25	Arts, entertainment, and recreation.....	4.2	3.3	3.5	3.3	5.0	6.2	5.6	4.2
26	Accommodation and food services.....	2.4	1.2	1.9	2.9	5.4	7.3	9.2	4.0
27	Other services, except government.....	4.1	3.9	2.7	3.0	5.4	7.8	9.6	5.4
28	Government	3.4	4.3	3.5	4.0	8.0	7.8	8.4	5.5
29	Federal.....	1.0	4.2	3.2	3.7	9.2	8.2	8.9	4.6
30	State and local.....	7.4	4.6	3.9	4.3	7.1	7.5	8.1	6.1
	Addenda:								
31	Private goods-producing industries ¹	2.7	1.5	0.8	1.2	4.5	7.5	8.1	0.1
32	Private services-producing industries ²	3.8	2.2	1.7	2.2	4.4	7.0	7.9	4.4

1. Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.

2. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational

services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.