

Gross Product by Industry Price Measures, 1977-96

By Robert E. Yuskavage

Brian C. Moyer, John Sporing, and Robert A. Sylvester assisted in the preparation of the estimates and the tables.

THIS ARTICLE presents annual estimates of prices and unit costs by industry group for 1977-96. The price measures of gross product originating by industry (GPO) provide insight into the sources of change in the aggregate price level by industry. For example, the relative growth rates of prices among industries can be compared, and their contributions to the aggregate (economy-wide) rate of price change can be computed. The unit-cost measures by industry can be used to identify the sources of GPO price change among the cost components of GPO—compensation of employees, indirect business taxes, and property-type income.

These measures of GPO prices and unit costs have not previously been included in the articles

on gross product by industry in the SURVEY OF CURRENT BUSINESS, and providing them marks another step in continuing efforts by the Bureau of Economic Analysis (BEA) to make the industry accounts data more useful. Until last year, these articles dealt almost exclusively with current-dollar and real GPO. In November 1997, BEA presented and discussed annual estimates of gross output and intermediate inputs by industry for the first time.¹

The first part of this article discusses the measurement and interpretation of GPO prices, including the relationship of GPO prices to gross

1. See Sherlene K.S. Lum and Robert E. Yuskavage, "Gross Product by Industry, 1947-96," SURVEY OF CURRENT BUSINESS 77 (November 1997): 20-34.

Gross Product Originating: Definition and Relationship to Gross Domestic Product

Gross product, or gross product originating (GPO), by industry is the contribution of each private industry and of government to the Nation's output, or gross domestic product (GDP). An industry's GPO, often referred to as its "value added," is equal to its gross output (sales or receipts and other operating income, commodity taxes, and inventory change) minus its intermediate inputs (consumption of goods and services purchased from other industries or imported).

For the national income and product accounts (NIPA's), GDP is measured as the sum of expenditure components. Gross domestic income (GDI) is measured as the sum of costs incurred and incomes earned in the production of GDP. In concept, GDP and GDI should be the same; in practice, they differ because their components are estimated using largely independent and less-than-perfect source data. BEA views GDP as the more reliable measure of output because the source data underlying the estimates of expenditures are considered to be more accurate.¹ The difference between GDP and GDI is the "statistical discrepancy"; it is recorded in the NIPA's as an "income" component that reconciles GDI with GDP.

Current-dollar GPO by industry is measured as the sum of distributions by industry of the components of GDI. Consequently, the sum of the current-dollar GPO estimates also differs from current-dollar GDP by the statistical discrepancy. In presenting the GPO estimates, the statistical discrepancy is included in the GPO of private industries because of BEA's view that most of the measurement problems with

the components of GDI affect the GPO of private industries rather than the GPO of general government or government enterprises.²

Real GDP in the NIPA's is also measured as the sum of the expenditure components. Real GPO estimates for most industries are derived using separate estimates of gross output and intermediate inputs.³ The sum of the real GPO estimates differs from real GDP by the real statistical discrepancy, which is shown as part of private-industry GPO, and by the category entitled "not allocated by industry," which is the difference between real GDP and the sum of real GPO for the detailed industries and of the statistical discrepancy. The value of the category "not allocated by industry" reflects the lack of additivity of detailed real GPO estimates that results from the formula used to calculate real output and from differences in the source data (both current dollars and prices) used to estimate industry GPO and the expenditures measure of real GDP. As with the current-dollar measures, BEA views the source data used to estimate the components of real GDP to be more reliable. In addition, the amount of detailed data available to calculate real GDP is greater than that for the gross output and intermediate inputs available to calculate real GPO. For some industries, no source data are available to measure gross output, and the resulting real GPO estimates are prepared using less reliable methodologies.

2. See "Note on Alternative Measures of Gross Product by Industry," SURVEY 77 (November 1997): 84.

3. For information about the computation of the real GPO estimates, see the box "Computation of the Chain-Type Quantity Indexes for Double-Deflated Industries" in Robert E. Yuskavage, "Improved Estimates of Gross Product by Industry, 1959-94," SURVEY 76 (August 1996): 142.

1. For additional information on the accuracy of the two measures, see the box "Statistical Discrepancy" in Robert P. Parker and Eugene P. Seskin, "Annual Revision of the National Income and Product Accounts," SURVEY OF CURRENT BUSINESS 77 (August 1997): 19.

output prices and intermediate inputs prices. The second part develops the concept of unit costs in the context of the GPO estimates, and it describes how these measures can be used to analyze changes in industry-cost structure and the return to capital. The third part discusses trends in GPO prices and unit costs by industry group for 1992–96. [Tables 4 and 5](#) at the end of the article present industry price and unit-cost measures by industry group for 1977–96.

GPO Prices

The GPO price index for an industry or industry group represents the implicit price for gross output less intermediate inputs. For most industries and industry groups, the GPO price measures are chain-type Fisher price indexes computed from data on gross output and intermediate inputs. For some industries, the GPO price measures are implicit price deflators because data for gross output prices are not available.

GPO can be defined as either an output measure (gross output less intermediate inputs) or as an input measure (costs incurred and incomes earned); see the box “[Gross Product Originating](#).” The measurement of the GPO price index is based on GPO’s definition as an output measure. As an output measure, GPO is the difference between the industry’s gross output and its intermediate inputs. Real GPO and the GPO price index can be derived from these separate measures using the double-deflation method. In the double-deflation method, estimates of gross output and of intermediate inputs are used in the calculation of real GPO.² As an input measure, an industry’s GPO represents the value-added inputs (labor services and capital services) that are combined with the intermediate inputs (energy, materials, and purchased services) to produce the gross output of the industry. The GPO price index thus represents the implicit price paid by the industry for its value-added inputs. Changes in the GPO price index for the industries for which the double-deflation method is used primarily reflect (1) changes in the prices and quantities of the gross output of the industry, (2) changes in the prices and quantities of the intermediate inputs used by the industry, and (3) changes in the ratio of intermediate inputs to gross output.

Gross output

Gross output prices represent the prices received by an industry for its products. The chain-type price index for gross output is computed from detailed data for the industry on product sales, shipments, and prices. Data on current-dollar product sales and shipments by industry are primarily from annual surveys by the Bureau of the Census. Detailed price indexes for manufacturing and wholesale trade are primarily producer price indexes (PPI’s) from the Bureau of Labor Statistics (BLS). Price indexes for farm products are from the U.S. Department of Agriculture, and price indexes for mineral products are mostly from the U.S. Department of Interior and the U.S. Department of Energy. Price indexes for selected products—including computers, semiconductors, digital telephone switching equipment, and selected equipment purchased by the U.S. Department of Defense—are from the national income and product accounts (NIPA’s). Price indexes for retail trade and for services are primarily BLS consumer price indexes (CPI’s), or they are derived from the NIPA’s.³

Intermediate inputs

Intermediate inputs prices represent the prices paid by an industry for its inputs of raw materials, semifinished goods, energy, and services purchased from other industries. The chain-type price index for intermediate inputs is computed from detailed data on industry product purchases and prices. Data on the commodity (product) composition of current-dollar intermediate inputs by industry are obtained primarily from BEA’s input-output accounts.⁴ Detailed price indexes for inputs of manufactured goods are from BLS: Primarily PPI’s for domestic goods and international price indexes for imports. These indexes are supplemented by selected price indexes from the NIPA’s. Detailed price indexes for inputs of services are primarily CPI’s, or gross output implicit price deflators.⁵

Input-output ratio

An industry’s input-output (I-O) ratio is computed as its intermediate inputs divided by its

2. For more information on the double-deflation method, see Robert E. Yuskavage, “Improved Estimates of Gross Product by Industry, 1959–94,” *SURVEY* 76 (August 1996): 142–145.

3. For a list of the sources for current-dollar product detail and price indexes for gross output, see Yuskavage, “Improved Estimates,” table 8.

4. Ann M. Lawson, “Benchmark Input-Output Accounts for the U.S. Economy, 1992: Make, Use, and Supplementary Tables,” *SURVEY* 77 (November 1997): 36–82.

5. For a list of the sources for the price indexes for intermediate inputs, see Yuskavage, “Improved Estimates,” table 9.

gross output. For an industry with one product, changes in the I-O ratio from year to year reflect shifts in the mix between intermediate inputs and value-added inputs (labor services and capital services). Such shifts may be viewed as changes in production technology that result from changes in the optimal input mix. Examples include economies of scale that result from changes in the rate of output and the contracting out of services that were once performed in-house by employees. At the GPO industry level, which approximates the two-digit Standard Industrial Classification (SIC), changes in the I-O ratio may also reflect changes in the relative size of the detailed industries that the GPO industry comprises.

The GPO price index can be viewed as a weighted average of gross output prices less intermediate inputs prices; thus, changes in the I-O ratio affect the GPO price index by changing the relative weights associated with these prices. Normally, this effect is small in comparison with the effects of changes in gross output prices or of changes in intermediate inputs prices.⁶

Relationship to NIPA prices

For the NIPA's, gross domestic product (GDP) is measured as the sum of final expenditures. GDP can also be measured as the sum of industry value added. In concept, the GDP price and quantity indexes computed from NIPA final expenditures are consistent with those computed from industry value added because both approaches exclude intermediate inputs. Consistency is maintained between the two approaches by the use of common source data for prices whenever possible. For example, the price indexes that are used for the producers' durable equipment component of NIPA final expenditures are also used for the gross output of durable goods manufacturing industries.

In practice, the results of the two approaches differ because of the lack of data for gross output prices for certain private services-producing industries and because of the lack of annual data for the commodity composition of intermediate inputs by industry. In addition, the two approaches differ in the treatment of trade margins and transport costs. In the NIPA's, final expenditures are valued in purchasers' prices which include the wholesale trade and retail trade margins and transport costs incurred as goods move

through the distribution system from producers (or importers) to final users. In the industry approach, value added is valued in producers' prices. Price measures associated with trade margins and transport costs are classified in the wholesale trade, retail trade, and transportation industries.⁷

As a result, price measures for specific GPO industries are not necessarily comparable to price measures for related NIPA expenditure components. For example, the NIPA chain-type price index for all durable goods products may differ from the GPO price index for durable goods manufacturing. GDP prices by type of expenditure reflect the prices of goods and services purchased for final use, whether domestically produced or imported; GPO prices by industry reflect the prices of the industry's gross output net of intermediate inputs. Gross output prices from the industry approach are more comparable to NIPA final expenditure prices, but gross output prices reflect sales by an industry to all of its customers, whereas NIPA price measures reflect sales to final purchasers, including sales of imports.

GPO Unit Costs

GPO unit costs show the contribution of the cost components of GPO to the GPO price index. GPO measures of unit cost are computed by dividing current-dollar GPO and its components by real (chained-dollar) GPO.⁸ The resulting quotients provide the GPO chain-type price index and the part of the price index associated with each component. If the unit cost for a component grows faster than the GPO price index, then the relative importance of that component in the cost structure has increased.

As an input measure, current-dollar GPO is measured as the sum of costs incurred and incomes earned in production; it is equal to gross domestic income, the components of which can be grouped into categories that approximate the shares of labor and capital. The labor share of production can be approximated using compensation of employees, which consists of wage and salary accruals, employer contributions for social insurance, and other labor income (primarily employer contributions to private pension

7. In the GPO estimates, the gross output of the wholesale trade and retail trade industries primarily consists of margin, which is defined as sales minus the cost of goods sold. Because price indexes for margin are not available, sales by detailed type of business are deflated, and the margin rate is assumed to be constant. Such assumptions are not required for the deflation of NIPA final expenditures.

8. Current-dollar cost per unit of real GPO equals the GPO price index divided by 100.

6. The direction and magnitude of the effect on the GPO price index depends on interactions among the gross output price index, the intermediate inputs price index, and the input-output ratio.

plans and health insurance). The capital share of production (property-type income) can be approximated using the remaining components of GPO except indirect business tax and nontax liability, which is excluded because it can be viewed as a part of the pretax return to capital that accrues to government rather than to business.⁹

GPO unit-cost measures for compensation of employees (unit labor costs) include wage and salary accruals, employer contributions for social insurance, and other labor income. Unit-cost measures for property-type income (income per unit of gross product) include both debt-financed and equity-financed capital, including capital consumption allowances. GPO unit-cost measures do not provide information on the separate contributions of labor and capital services or of labor and capital prices to the change in GPO prices, because GPO unit-cost measures attribute changes in GPO unit prices to the components of GPO in proportion to each component's share of current-dollar GPO. Thus, year-to-year changes in component shares of current-dollar GPO will result in changes in the contributions of the components to GPO prices, even if the prices do not change.

GPO Prices and Unit Costs for 1992–96

This part of the article presents estimates of changes in GPO prices and unit costs by industry group for 1992–96. The first section discusses differences in GPO price changes among industries, including the effects of differences in changes in gross output prices and in intermediate inputs prices. The second section discusses the contributions of GPO components to changes in the GPO price index.

GPO price changes

The GDP chain-type price index increased at an average annual rate of 2.5 percent in 1992–96; private industries increased 2.2 percent, and government increased 3.3 percent (table 1). Among the private industry groups, the GPO price index for durable goods manufacturing declined 1.2 percent. The GPO price indexes for all the other industry groups increased; the increases ranged from 0.4 percent for electric, gas, and sanitary services to 3.8 percent for agriculture, forestry,

and fishing. Except for electric, gas, and sanitary services, the industry groups with GPO price changes that were less than the GDP price change (2.5 percent) were those associated with the pro-

Table 1.—Percent Changes in Chain-Type Price Indexes by Industry Group, 1993–96

	1993	1994	1995	1996	Average annual rate of change, 1992–96
Gross domestic product	2.6	2.4	2.5	2.3	2.5
Private industries ¹	2.5	1.8	2.0	2.4	2.2
Agriculture, forestry, and fishing:					
Gross output	2.6	–6	.9	10.3	3.2
Intermediate inputs	1.9	2.2	1.7	5.2	2.7
Gross product	3.7	–3.5	–4	16.6	3.8
Mining:					
Gross output	–5	–3.9	.4	17.1	3.0
Intermediate inputs	1.3	–1.2	1.8	10.8	3.1
Gross product	–1.9	–5.7	–5	21.0	2.7
Construction:					
Gross output	3.2	3.5	4.0	2.3	3.3
Intermediate inputs	3.0	3.0	3.2	1.8	2.7
Gross product	3.5	4.0	4.8	2.8	3.7
Manufacturing:					
Gross output	1.0	1.2	2.3	–2	1.1
Intermediate inputs .....	.8	1.7	4.2	–2	1.6
Gross product	1.4	.5	–9	–4	.2
Durable goods:					
Gross output	1.1	1.3	.1	–2.4	0
Intermediate inputs	1.1	2.1	2.2	–2.3	.8
Gross product	1.2	0	–3.1	–2.7	–1.2
Nondurable goods:					
Gross output .....	.9	1.2	4.9	2.4	2.3
Intermediate inputs .....	.5	1.2	6.5	2.2	2.6
Gross product	1.7	1.1	1.9	2.8	1.9
Transportation and public utilities ¹	1.8	.7	2.3	1.1	1.5
Transportation ¹	1.1	1.5	3.2	.6	1.6
Communications:					
Gross output	1.3	.6	.9	1.9	1.2
Intermediate inputs	–5	–2.2	–2.1	1.2	–9
Gross product	2.2	2.2	2.9	2.7	2.5
Electric, gas, and sanitary services:					
Gross output	2.6	–7	–2	2.6	1.1
Intermediate inputs	3.7	1.0	–2.6	10.0	2.9
Gross product	2.1	–1.5	.6	.3	.4
Wholesale trade:					
Gross output	1.8	2.7	2.2	0	1.7
Intermediate inputs	2.3	2.6	3.7	2.1	2.7
Gross product	1.6	2.7	1.5	–1.1	1.2
Retail trade:					
Gross output	1.5	1.6	1.1	1.3	1.4
Intermediate inputs	2.1	2.5	2.9	2.6	2.5
Gross product	1.2	1.1	.1	.5	.7
Finance, insurance, and real estate ¹	3.7	2.1	4.4	4.1	3.6
Services ¹	3.6	3.8	3.2	3.4	3.5
Government ¹	3.1	3.1	3.4	3.7	3.3
Addenda:					
Private goods-producing industries ² :					
Gross output	1.5	1.2	2.4	1.2	1.6
Intermediate inputs	1.2	1.8	3.9	.5	1.8
Gross product	2.1	.4	0	2.3	1.2
Private services-producing industries ^{1,3}	2.6	2.4	2.9	2.5	2.6

1. Gross product price index.

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

3. Consists of transportation and public utilities; wholesale trade; retail trade; finance, insurance, and real estate; and services.

NOTE.—Estimates for gross output and for intermediate inputs are shown only for industry groups for which the double-deflation method is used for each detailed industry in the group. See footnote 2 in the text.

9. For purposes of this analysis, property-type income is defined as the sum of corporate profits, proprietors' income, rental income of persons, net interest, capital consumption allowances, business transfer payments, and the current surplus of government enterprises less subsidies. However, a substantial portion of proprietors' income represents the labor share of production.

duction and distribution of manufactured goods (manufacturing, transportation, wholesale trade, and retail trade).

The GPO price changes for private services-producing industries (2.6 percent) exceeded the GDP price change, and the GPO price change for private goods-producing industries (1.2 percent) was less than the GDP price change. The slower growth in the GPO price index for private goods-producing industries, compared with the growth for private services-producing industries, continues a trend that started in 1982 and continued each year except for 1989 (chart 1). In 1989, the GPO price index for goods-producing industries was boosted by a relatively large increase in gross output prices for oil and gas extraction. Since 1977, GPO prices for private services-producing industries have increased faster than GDP prices; since 1992, a deceleration in GPO prices for private services-producing industries has contributed to a deceleration in GDP prices.

As mentioned earlier, the GPO price index can be viewed as a weighted average of gross output prices and intermediate inputs prices for industries for which the double-deflation method is used. Changes in GPO prices are positively correlated with changes in gross output prices and negatively correlated with changes in intermediate inputs prices. GPO prices increase faster than gross output prices when gross output prices increase faster than intermediate inputs

prices; conversely, GPO prices increase slower than gross output prices when gross output prices increase slower than intermediate inputs prices. In 1992–96, GPO prices increased faster than gross output prices in agriculture, forestry, and fishing, in construction, and in communications. GPO prices increased slower than gross output prices in all other industry groups.

In 1996, the GPO price index for private industries increased 2.4 percent, slightly more than the 2.3-percent increase in the GDP price index. The GPO price index for manufacturing declined for the second consecutive year, as an increase in nondurable goods was more than offset by a decline in durable goods. Three of the four other industry groups for which the GPO price index either increased less than the GDP price index or decreased are at least partly involved with the distribution of goods to consumers: Transportation (0.6 percent), electric, gas, and sanitary services (0.3 percent), wholesale trade (-1.1 percent), and retail trade (0.5 percent). Among the industry groups for which the GPO price index increased more than the GDP price index, the increases were large in agriculture, forestry, and fishing (16.6 percent) and mining (21.0 percent). The increases were smaller in finance, insurance, and real estate (4.1 percent) and services (3.4 percent). Government increased 3.7 percent.

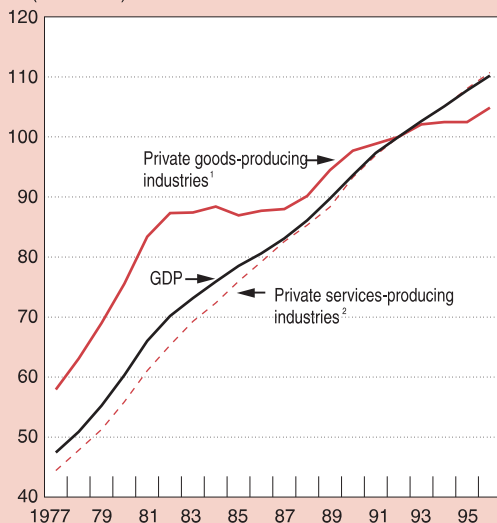
Contributions to change.—GPO prices can be used to assess an industry's contribution to the change in GDP prices. Because real GDP can be viewed as the combined result of aggregate inputs of labor services and capital services, the GDP price index can be viewed as the price index for aggregate inputs of labor services and capital services. Because GPO as an input measure represents the industry's value-added inputs of labor services and capital services, the GPO price index can be used to compute contributions to GDP price change.

The extent to which industries contribute to the change in the GDP price index depends on the industry's size relative to GDP as well as on the growth rates in GPO prices.¹⁰ In 1992–96, the largest contributors to the change in the GDP price index were services and finance, insurance, and real estate (0.7 percentage point each) (table 2). Government contributed 0.5 per-

CHART 1

Chain-Type Price Indexes

(1992=100)



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

2. Consists of transportation and public utilities; wholesale trade; retail trade; finance, insurance and real estate; and services.

U.S. Department of Commerce, Bureau of Economic Analysis

10. For a description of the calculation of these contributions, see "Note on Computing Alternative Chained Dollar Indexes and Contributions to Growth" in J. Steven Landefeld and Robert P. Parker, "BEA'S Chain Indexes, Time Series, and Measures of Long-Term Economic Growth," SURVEY 77 (May 1997): 63. The procedure described in the note was modified to replace the chain-type quantity index with the chain-type price index.

centage points.¹¹ In manufacturing, prices were unchanged, so the contribution of manufacturing prices to GDP price change was 0.0 percentage point; durable goods manufacturing contributed -0.1 percentage point. In 1995 and 1996, the contribution of durable goods manufacturing was -0.3 percentage point. Finance, insurance, and real estate made the largest positive contribution in each of those years (0.8 percentage point).

Gross output prices.—Gross output prices, which are the prices received by producers, can be viewed as a weighted average of the prices for intermediate inputs and for value-added inputs (labor services and capital services). In manufacturing, gross output prices increased only 1.1 percent in 1992–96. Gross output prices in durable goods manufacturing were unchanged, while gross output prices in nondurable goods manufacturing increased 2.3 percent. The slow growth in the prices of manufactured products, especially durable goods, together with the de-

celeration of prices for private services-producing industries, have contributed substantially to the low rate of GDP price change since 1992.

Within durable goods manufacturing, gross output prices in 1992–96 declined in electronic and other electric equipment (5.7 percent) and industrial machinery and equipment (2.8 percent). The declines were primarily for products deflated with BEA's quality-adjusted price indexes: Computers, semiconductors, and digital telephone switching equipment. Gross output price increases in the remaining industries ranged from 1.0 percent for instruments and related products to 4.4 percent for lumber and wood products.

Unit costs

Because the GPO price index measures the change in the cost of the value-added inputs of labor services and capital services, it can be used in combination with the components of GPO to assess their contributions to the change in total value-added costs. When a component of GPO unit costs grows faster than the GPO price index, then that component's contribution to the growth in unit costs has increased.

The cost per unit of real GPO for private industries increased 2.2 percent in 1992–96 (table 3).

11. The GPO price index for government is an implicit price deflator computed as current-dollar GPO divided by real (chained-dollar) GPO. For general government, which comprises most of government, current-dollar GPO consists of compensation of employees and consumption of fixed capital. Real consumption of fixed capital is estimated by direct deflation using price indexes from the NIPAS. Real compensation of employees is estimated by extrapolating base-year current-dollar values by an indicator of labor input.

Table 2.—Contributions to Percent Change in the Chain-Type Price Index for Gross Domestic Product, 1993–96

	1993	1994	1995	1996	1992–96 ¹
Percent change:					
Gross domestic product	2.6	2.4	2.5	2.3	2.5
Percentage points:					
Private industries	2.2	1.5	1.7	2.1	1.9
Agriculture, forestry, and fishing ...	.1	-.1	0	.3	.1
Mining	0	-.1	0	.3	0
Construction .....	.1	.1	.2	.1	.1
Manufacturing .....	.2	.1	-.2	-.1	0
Durable goods .....	.1	0	-.3	-.3	-.1
Nondurable goods .....	.1	.1	.1	.2	.1
Transportation and public utilities	.1	.1	.2	.1	.1
Transportation	0	0	.1	0	0
Communications .....	.1	.1	.1	.1	.1
Electric, gas, and sanitary services .....	.1	0	0	0	0
Wholesale trade .....	.1	.2	.1	-.1	.1
Retail trade .....	.1	.1	0	0	.1
Finance, insurance, and real estate .....	.7	.4	.8	.8	.7
Services .....	.7	.7	.6	.7	.7
Statistical discrepancy ²	0	0	0	0	0
Government .....	.4	.4	.5	.5	.5
Not allocated by Industry ³	0	.4	.3	-.3	.1

1. Average annual rate.

2. Equals GDP measured as the sum of expenditures less gross domestic income.

3. Equals GDP less the statistical discrepancy and the sum of GPO of the detailed industries.

NOTE.—For information on the calculation of the contributions to percent change, see footnote 10 in the text.

Data Availability

This article presents summary estimates of gross product by industry prices and unit costs. Price indexes and real GPO estimates for detailed industries for 1977–96 and current-dollar GPO estimates for 1947–96 are available on the Internet on BEA's home page at <<http://www.bea.doc.gov>>. They are also available online to subscribers to STAT-USA's Economic Bulletin Board (call 202-482-1986), or to STAT-USA's Internet site at <<http://www.stat-usa.gov>>.

In addition, the following estimates are available from BEA on diskettes:

- Gross Product by Industry, 1947–96, product number NDN-0174, price \$20.00.
- Gross Output by Detailed Industry, 1977–96, product number NDN-0175, price \$20.00.
- Manufacturing Industry Shipments, 1977–96, product number NDN-0176, price \$20.00.
- Manufacturing Product Shipments, 1977–95, product number NDN-0177, price \$20.00.

To order using Visa or MasterCard, call the BEA Order Desk at 1-800-704-0415 (outside the United States, call (202) 606-9666). To order by mail, send a check payable to "Bureau of Economic Analysis, BE-53," to BEA Order Desk, Bureau of Economic Analysis, BE-53, U.S. Department of Commerce, Washington, DC 20230.

Compensation of employees per unit of GPO (unit labor costs) increased 1.7 percent. Unit costs for indirect business tax and nontax liability increased 0.8 percent, and unit costs for property-type income increased 3.2 percent. The larger increase in the unit costs for property-type income indicates that capital costs became a larger part of GPO unit costs during the period or that the return to capital per unit of gross product increased.

In 1992–96, unit labor costs declined in two private industry groups: Mining and durable goods manufacturing. Unit labor costs increased in all other private industry groups except wholesale trade, which was unchanged. In agriculture, forestry, and fishing and in services, the increases in unit labor costs were larger than the increases in total unit costs.

As with GPO prices, declines and relatively small increases in unit labor costs were in industry groups involved with the production and distribution of goods. In manufacturing, unit labor costs declined at an average annual rate of 1.7 percent in 1992–96, compared with a 0.2-percent increase in total unit costs. Unit labor costs in durable goods manufacturing declined 3.5 percent, while total unit costs declined 1.2 percent. In wholesale trade, in retail trade, and in transportation and public utilities, the increases in unit labor costs were substantially smaller than the increases in total unit costs.

In 1996, unit labor costs increased 1.9 percent in all private industries, less than the increase in total unit costs (2.4 percent). Unit labor costs increased in all private industry groups except durable goods manufacturing and wholesale trade. Durable goods manufacturing fell 3.9 percent; this fall marked the fourth consecutive year that unit labor costs fell in this industry group. Unit labor costs in manufacturing fell 1.1 percent, the third consecutive annual decline, despite an increase in nondurable goods manufacturing.

In 1996, the increases in unit labor costs exceeded the increase in total unit costs in only three industries: Construction; finance, insurance, and real estate; and services. In construction, unit labor costs rose faster than total unit costs for the first time since 1992; unit property-type income increased only 0.6 percent. In finance, insurance, and real estate, unit labor costs increased considerably more than in the 2 preceding years. In services, the increase in unit labor costs was somewhat less than the increase in 1995.


Tables 4 and 5 follow. 

Table 3.—Percent Changes in Current-Dollar Cost Per Unit of Real Gross Product Originating for Private Industry Groups, 1993–96

	1993	1994	1995	1996	Average annual rate of change, 1992–96
Total	2.5	1.8	2.0	2.4	2.2
Compensation of employees	2.4	0.5	2.0	1.9	1.7
Indirect business tax and nontax liability	2.1	2.1	-1.0	0	.8
Property-type income	2.5	4.0	2.6	3.5	3.2
Agriculture, forestry, and fishing	3.7	-3.5	-4	16.6	3.8
Compensation of employees	17.6	-9.0	13.7	6.9	6.8
Indirect business tax and nontax liability	9.4	-6.9	14.8	1.6	4.4
Property-type income	-2.4	-5	-7.9	23.5	2.5
Mining	-1.9	-5.7	-5	21.0	2.7
Compensation of employees	-5.1	-5.1	-4.4	8.6	-1.7
Indirect business tax and nontax liability	-5.2	-7.3	-9.8	21.7	-9
Property-type income .....	.9	-5.8	4.2	27.8	6.1
Construction	3.5	4.0	4.8	2.8	3.7
Compensation of employees	2.0	3.4	4.5	3.9	3.5
Indirect business tax and nontax liability	4.5	0	0	4.3	2.2
Property-type income	7.0	5.5	5.2	.6	4.6
Manufacturing	1.4	.5	-9	-4	.2
Compensation of employees .....	.6	-2.9	-3.5	-1.1	-1.7
Indirect business tax and nontax liability	0	-4.8	-2.5	-2.6	-2.5
Property-type income	3.6	9.7	4.4	1.2	4.7
Durable goods	1.2	0	-3.1	-2.7	-1.2
Compensation of employees	-1.4	-4.0	-4.7	-3.9	-3.5
Indirect business tax and nontax liability	0	-7.7	0	-4.2	-3.0
Property-type income	11.1	13.4	1.1	.8	6.4
Nondurable goods	1.7	1.1	1.9	2.8	1.9
Compensation of employees	2.9	-2.0	-1.9	2.4	.3
Indirect business tax and nontax liability	3.3	-4.8	-1.7	3.4	0
Property-type income	-3	7.0	8.3	3.4	4.5
Transportation and public utilities	1.8	.7	2.3	1.1	1.5
Compensation of employees .....	.2	0	2.4	1.1	.9
Indirect business tax and nontax liability	0	3.0	0	-5.8	-8
Property-type income	3.8	1.1	2.4	2.5	2.4
Wholesale trade	1.6	2.7	1.5	-1.1	1.2
Compensation of employees	0	-1.5	4.3	-2.8	0
Indirect business tax and nontax liability	4.8	4.2	-2.4	-2.9	.9
Property-type income	3.2	13.1	-9	5.6	5.1
Retail trade	1.2	1.1	.1	.5	.7
Compensation of employees	-2	-2	1.2	.3	.3
Indirect business tax and nontax liability	1.6	.5	2.1	.5	1.2
Property-type income	4.4	5.1	-4.4	1.4	1.5
Finance, insurance, and real estate	3.7	2.1	4.4	4.1	3.6
Compensation of employees	5.8	1.2	1.9	5.3	3.5
Indirect business tax and nontax liability	2.8	1.4	-7	2.7	1.5
Property-type income	3.2	2.4	6.8	3.9	4.0
Services	3.6	3.8	3.2	3.4	3.5
Compensation of employees	4.6	3.2	4.8	3.5	4.0
Indirect business tax and nontax liability	8.0	3.7	3.6	0	3.8
Property-type income .....	.4	5.4	-1.1	3.0	1.9

Table 4.—Chain-Type Price Indexes for Gross Output, Intermediate Inputs, and Gross Product by Industry Group, 1977–96

[1992=100]

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Gross domestic product	47.42	50.88	55.22	60.34	66.01	70.18	73.16	75.92	78.53	80.58	83.06	86.10	89.72	93.64	97.32	100.00	102.64	105.09	107.76	110.22
Private industries ¹	48.25	52.71	56.93	61.99	67.98	72.12	74.60	77.36	79.31	81.77	84.41	86.90	90.35	94.38	97.67	100.00	102.50	104.34	106.42	108.95
Agriculture, forestry, and fishing: Gross output	74.61	84.31	94.90	97.52	100.87	92.54	101.06	101.78	89.18	89.52	91.89	99.49	105.05	104.32	100.86	100.00	102.64	102.04	102.94	113.59
Intermediate inputs	62.77	71.86	77.48	80.25	85.63	89.68	89.73	94.90	85.87	83.42	89.26	94.88	99.28	99.69	100.11	100.00	101.88	104.12	105.92	111.43
Gross product	88.50	106.90	115.57	106.01	104.84	96.18	107.72	107.52	92.96	90.95	94.56	104.57	111.54	109.46	101.66	100.00	103.70	100.08	99.66	116.21
Mining: Gross output	62.14	68.15	85.82	114.64	148.19	151.99	143.11	138.48	131.96	97.22	97.46	93.46	100.46	110.85	102.45	100.00	99.46	95.55	95.94	112.36
Intermediate inputs	55.48	60.11	70.83	87.62	105.53	109.44	107.83	107.67	106.11	88.49	90.37	90.31	95.55	103.24	100.64	100.00	101.31	100.09	101.91	112.95
Gross product	65.71	72.71	96.80	137.46	186.43	189.80	173.13	163.70	152.44	103.32	102.26	95.67	103.74	115.93	103.70	100.00	98.14	92.52	92.09	111.46
Construction: Gross output	48.54	53.81	59.48	65.70	71.91	77.19	78.86	80.85	82.47	85.56	88.62	92.17	94.94	97.86	98.99	100.00	103.25	106.89	111.21	113.81
Intermediate inputs	53.05	57.44	63.98	71.32	77.24	79.14	80.88	83.00	85.13	84.08	86.35	90.24	93.50	96.40	97.94	100.00	103.02	106.10	109.45	111.43
Gross product	43.86	49.98	54.76	59.89	66.33	75.12	76.70	78.55	79.65	86.75	90.56	93.80	96.16	99.08	99.88	100.00	103.45	107.58	112.71	115.82
Manufacturing: Gross output	57.71	61.59	68.21	77.00	83.49	85.44	86.33	88.32	88.06	86.42	88.20	91.90	95.94	98.64	99.36	100.00	101.02	102.28	104.64	104.39
Intermediate inputs	57.51	61.47	69.77	80.62	88.01	88.66	89.87	91.99	91.63	86.75	90.02	94.53	98.51	101.06	100.17	100.00	100.79	102.48	106.81	106.62
Gross product	58.08	61.81	66.06	71.04	75.95	80.22	80.56	82.33	82.24	86.11	85.36	87.44	91.64	94.63	97.89	100.00	101.42	101.92	100.99	100.63
Durable goods: Gross output	60.02	64.44	70.35	76.61	82.29	85.67	87.40	89.14	89.24	89.69	90.56	93.53	96.76	98.07	99.22	100.00	101.12	102.42	102.55	100.05
Intermediate inputs	57.70	61.88	68.68	76.10	81.87	83.95	86.50	88.50	89.14	87.89	90.30	95.60	98.69	99.79	99.80	100.00	101.07	103.20	105.44	103.06
Gross product	63.82	68.64	73.00	77.28	82.81	88.21	88.64	89.98	89.24	92.35	90.85	90.37	93.79	95.41	98.30	100.00	101.21	101.17	98.03	95.36
Nondurable goods: Gross output	54.85	58.13	66.04	77.46	84.79	85.33	85.43	87.67	87.04	83.18	85.91	90.18	95.14	99.35	99.47	100.00	100.91	102.13	107.12	109.67
Intermediate inputs	57.17	60.91	70.67	84.85	93.76	93.11	93.15	95.38	94.03	85.61	89.72	93.46	98.31	102.26	100.52	100.00	100.51	101.75	108.37	110.72
Gross product	51.11	53.51	57.63	63.44	67.59	70.52	70.76	73.01	73.73	78.50	78.64	83.84	89.01	93.70	97.41	100.00	101.70	102.86	104.84	107.77
Transportation and public utilities ¹	51.65	55.73	57.83	62.88	70.63	77.20	80.99	84.77	88.85	93.37	92.64	94.70	97.13	98.06	99.78	100.00	101.76	102.49	104.80	105.97
Transportation ¹	54.30	59.34	63.03	68.93	77.25	77.48	76.83	80.85	84.45	87.49	90.09	96.92	98.29	99.82	100.16	100.00	101.12	102.60	105.87	106.46
Communications: Gross output	59.05	60.78	62.12	64.56	70.48	75.90	79.13	83.58	88.91	92.02	91.39	92.43	95.84	97.59	98.59	100.00	101.26	101.92	102.86	104.78
Intermediate inputs	52.32	55.68	59.96	66.22	71.50	75.12	78.35	81.07	84.31	86.53	88.13	90.43	94.42	96.70	98.77	100.00	99.50	97.32	95.32	96.45
Gross product	62.77	63.76	63.75	64.53	70.06	77.06	80.35	85.83	92.49	96.18	93.98	94.14	97.02	98.29	98.53	100.00	102.17	104.38	107.40	110.29
Electric, gas, and sanitary services: Gross output	43.70	47.94	53.71	64.48	75.07	88.05	95.91	97.52	97.64	96.08	92.62	91.45	94.39	96.50	99.38	100.00	102.65	101.92	101.69	104.37
Intermediate inputs	48.94	52.68	62.46	76.75	89.37	102.90	109.64	110.88	108.48	97.25	93.80	93.47	97.04	100.42	99.03	100.00	103.71	104.72	102.04	112.27
Gross product	40.05	44.84	46.49	53.72	62.55	75.52	84.89	86.90	89.34	95.79	92.27	90.52	93.07	94.44	99.55	100.00	102.11	100.57	101.19	101.45
Wholesale trade: Gross output	62.37	66.08	71.36	78.22	82.97	83.89	86.30	88.19	90.26	86.34	90.62	94.81	95.65	99.98	100.73	100.00	101.82	104.53	106.83	106.82
Intermediate inputs	48.81	52.07	57.14	64.10	70.50	73.92	76.95	80.27	82.44	82.67	85.34	88.70	92.24	96.05	98.36	100.00	102.25	104.94	108.81	111.11
Gross product	70.76	74.67	79.89	86.40	89.74	89.08	91.12	92.19	94.20	88.15	93.21	97.85	97.26	101.86	101.81	100.00	101.62	104.34	105.88	104.75
Retail trade: Gross output	50.49	53.76	58.70	64.62	69.74	73.83	76.08	78.72	80.59	80.52	85.78	86.72	90.18	93.86	97.71	100.00	101.55	103.19	104.35	105.71
Intermediate inputs	47.48	51.02	56.01	62.63	68.94	72.70	75.94	80.02	82.41	83.73	85.95	88.90	92.97	96.82	99.13	100.00	102.08	104.60	107.67	110.49
Gross product	52.19	55.30	60.20	65.66	70.01	74.28	76.16	77.89	79.51	78.84	85.59	85.44	88.57	92.15	96.88	100.00	101.24	102.36	102.43	102.99
Finance, insurance, and real estate ¹	38.16	41.73	44.61	48.48	53.63	57.54	62.80	66.20	71.33	78.47	81.69	83.36	87.07	92.35	97.82	100.00	103.73	105.91	110.57	115.10
Services ¹	35.85	38.78	42.33	46.54	51.36	56.30	60.45	64.12	67.55	71.45	75.35	79.87	84.00	89.65	94.33	100.00	103.55	107.47	110.90	114.64
Government ¹	40.92	43.72	47.09	51.48	56.92	61.73	65.40	70.23	74.38	77.29	80.65	83.83	87.20	91.40	96.08	100.00	103.07	106.29	109.87	113.98
Addenda:																				
Private goods-producing industries ² : Gross output	57.48	61.94	69.36	78.56	86.30	88.33	88.96	90.57	89.80	87.08	88.99	92.47	96.58	99.45	99.53	100.00	101.54	102.76	105.18	106.46
Intermediate inputs	57.22	61.42	69.77	80.54	87.95	89.06	89.92	91.80	91.41	86.49	89.68	94.05	98.02	100.64	99.98	100.00	101.20	102.97	107.03	107.56
Gross product	57.91	63.08	68.99	75.56	83.37	87.31	87.41	88.38	86.91	87.67	87.96	90.15	94.47	97.71	98.84	100.00	102.08	102.46	102.48	104.86
Private services-producing industries ^{1,3}	44.41	47.80	51.27	55.88	61.05	65.32	69.27	72.35	75.98	79.21	82.58	85.27	88.33	93.26	96.94	100.00	102.63	105.04	108.08	110.74

1. Gross product price index.
2. Consists of agriculture, forestry, and fishing; mining; construction; and manufacturing.
3. Consists of transportation and public utilities; wholesale trade; retail trade; finance, insurance, and real estate; and services.

NOTES—Estimates for gross output and for intermediate inputs are shown only for industry groups for which the double-deflation method is used for each detailed industry in the group. See footnote 2 in the text.
Estimates for 1977–86 are shown on the basis of the 1972 Standard Industrial Classification (SIC). Estimates for 1987–96 are shown on the basis of the 1987 SIC.

Table 5.—Current-Dollar Cost Per Unit of Real Gross Product Originating by Private Industry Group, 1977–96

[Dollars]

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Total	0.483	0.527	0.569	0.620	0.680	0.721	0.746	0.774	0.793	0.818	0.844	0.869	0.904	0.944	0.977	1.000	1.025	1.043	1.064	1.090
Compensation of employees .....	.262	.288	.315	.346	.372	.397	.405	.413	.425	.442	.458	.470	.486	.511	.528	.543	.556	.559	.570	.581
Indirect business tax and nontax liability .....	.047	.048	.049	.055	.063	.066	.070	.071	.073	.074	.076	.076	.080	.085	.092	.095	.097	.099	.098	.098
Property-type income .....	.174	.192	.205	.219	.245	.258	.270	.289	.296	.301	.310	.323	.338	.348	.357	.362	.371	.386	.396	.410
Agriculture, forestry, and fishing .....	.885	1.069	1.156	1.060	1.048	.962	1.077	1.075	.930	.909	.946	1.046	1.115	1.095	1.017	1.000	1.037	1.001	.997	1.162
Compensation of employees .....	.184	.212	.217	.241	.203	.213	.298	.237	.216	.222	.230	.286	.287	.304	.299	.273	.321	.292	.332	.355
Indirect business tax and nontax liability .....	.051	.053	.054	.055	.049	.044	.067	.049	.044	.045	.048	.055	.055	.056	.056	.053	.058	.054	.062	.063
Property-type income .....	.650	.804	.884	.764	.796	.704	.712	.789	.669	.642	.667	.704	.773	.735	.661	.674	.658	.655	.603	.745
Mining .....	.657	.727	.968	1.375	1.864	1.898	1.731	1.637	1.524	1.033	1.023	.957	1.037	1.159	1.037	1.000	.981	.925	.921	1.115
Compensation of employees .....	.206	.238	.327	.356	.447	.486	.463	.439	.406	.371	.343	.292	.324	.333	.340	.353	.335	.318	.304	.330
Indirect business tax and nontax liability .....	.057	.061	.086	.208	.430	.351	.287	.246	.193	.124	.109	.090	.107	.112	.114	.116	.110	.102	.092	.112
Property-type income .....	.394	.429	.555	.810	.987	1.061	.982	.952	.925	.538	.570	.574	.607	.715	.584	.531	.536	.505	.526	.672
Construction .....	.439	.500	.548	.599	.663	.751	.767	.786	.797	.867	.906	.938	.962	.991	.999	1.000	1.035	1.076	1.127	1.158
Compensation of employees .....	.303	.344	.386	.428	.489	.545	.543	.535	.538	.569	.604	.631	.652	.687	.698	.691	.705	.729	.762	.792
Indirect business tax and nontax liability .....	.009	.010	.010	.011	.011	.014	.017	.015	.014	.015	.016	.017	.018	.019	.020	.022	.023	.023	.023	.024
Property-type income .....	.127	.147	.152	.160	.163	.193	.207	.235	.245	.283	.285	.289	.291	.285	.281	.287	.307	.324	.341	.343
Manufacturing .....	.581	.618	.661	.710	.759	.802	.806	.823	.822	.861	.854	.874	.916	.946	.979	1.000	1.014	1.019	1.010	1.006
Compensation of employees .....	.407	.437	.473	.530	.555	.590	.578	.576	.586	.607	.585	.585	.609	.633	.663	.680	.684	.664	.641	.634
Indirect business tax and nontax liability .....	.024	.023	.023	.025	.027	.028	.031	.030	.030	.033	.030	.029	.031	.034	.040	.042	.042	.040	.039	.038
Property-type income .....	.149	.158	.165	.155	.177	.184	.196	.217	.206	.221	.239	.260	.277	.280	.276	.278	.288	.316	.330	.334
Durable goods .....	.638	.686	.730	.773	.828	.882	.886	.900	.892	.923	.909	.904	.938	.954	.983	1.000	1.012	1.012	.980	.954
Compensation of employees .....	.475	.510	.565	.624	.656	.705	.692	.667	.685	.708	.678	.666	.690	.712	.749	.766	.755	.725	.691	.664
Indirect business tax and nontax liability .....	.015	.014	.015	.016	.017	.019	.018	.017	.018	.019	.019	.018	.020	.022	.025	.026	.026	.024	.024	.023
Property-type income .....	.148	.163	.150	.134	.155	.158	.177	.216	.190	.196	.211	.220	.227	.220	.209	.208	.231	.262	.265	.267
Nondurable goods .....	.511	.535	.576	.634	.676	.705	.708	.730	.737	.785	.786	.838	.890	.937	.974	1.000	1.017	1.029	1.048	1.078
Compensation of employees .....	.325	.347	.361	.416	.433	.456	.448	.466	.466	.486	.473	.485	.508	.535	.561	.580	.597	.585	.574	.588
Indirect business tax and nontax liability .....	.035	.035	.033	.037	.038	.039	.045	.045	.045	.049	.043	.042	.045	.049	.058	.060	.062	.059	.058	.060
Property-type income .....	.151	.153	.182	.181	.204	.210	.214	.219	.226	.250	.271	.311	.338	.353	.355	.360	.359	.384	.416	.430
Transportation and public utilities .....	.516	.557	.578	.629	.706	.772	.810	.848	.888	.934	.926	.947	.971	.981	.998	1.000	1.018	1.025	1.048	1.060
Compensation of employees .....	.264	.286	.309	.334	.362	.396	.385	.395	.413	.431	.423	.427	.439	.451	.448	.454	.455	.455	.466	.471
Indirect business tax and nontax liability .....	.054	.054	.053	.056	.060	.067	.074	.077	.082	.086	.084	.087	.091	.095	.099	.101	.101	.104	.104	.098
Property-type income .....	.199	.218	.216	.239	.284	.308	.351	.376	.393	.417	.420	.433	.441	.435	.451	.445	.462	.467	.478	.490
Wholesale trade .....	.708	.747	.799	.864	.897	.891	.911	.922	.942	.881	.932	.978	.973	1.019	1.018	1.000	1.016	1.043	1.059	1.047
Compensation of employees .....	.378	.407	.440	.493	.514	.527	.535	.523	.538	.507	.561	.579	.582	.618	.597	.588	.588	.579	.604	.587
Indirect business tax and nontax liability .....	.160	.160	.156	.158	.159	.159	.185	.189	.192	.182	.203	.216	.210	.224	.232	.227	.238	.248	.242	.235
Property-type income .....	.170	.180	.203	.213	.224	.204	.191	.209	.212	.193	.167	.184	.180	.177	.189	.185	.191	.216	.214	.226
Retail trade .....	.522	.553	.602	.657	.700	.743	.762	.779	.795	.788	.856	.854	.886	.922	.969	1.000	1.012	1.024	1.024	1.030
Compensation of employees .....	.316	.336	.372	.417	.438	.457	.454	.457	.462	.466	.515	.523	.534	.564	.590	.610	.609	.608	.615	.617
Indirect business tax and nontax liability .....	.080	.087	.096	.106	.111	.119	.123	.129	.134	.135	.150	.147	.155	.166	.175	.185	.188	.189	.193	.194
Property-type income .....	.127	.130	.133	.134	.151	.166	.185	.192	.200	.187	.190	.184	.197	.192	.204	.206	.215	.226	.216	.219
Finance, insurance, and real estate .....	.382	.417	.446	.485	.536	.575	.628	.662	.713	.785	.817	.834	.871	.923	.978	1.000	1.037	1.059	1.106	1.151
Compensation of employees .....	.086	.093	.100	.110	.121	.134	.146	.154	.168	.191	.203	.209	.210	.221	.231	.242	.256	.259	.264	.278
Indirect business tax and nontax liability .....	.068	.067	.067	.072	.080	.089	.093	.098	.104	.112	.114	.112	.119	.127	.140	.142	.146	.148	.147	.151
Property-type income .....	.228	.257	.279	.302	.334	.352	.388	.410	.441	.482	.500	.513	.541	.575	.607	.616	.636	.651	.695	.722
Services .....	.359	.388	.423	.465	.514	.563	.604	.641	.675	.714	.753	.799	.840	.896	.943	1.000	1.036	1.075	1.109	1.146
Compensation of employees .....	.236	.258	.286	.319	.357	.393	.422	.444	.465	.492	.529	.558	.589	.636	.673	.716	.749	.773	.810	.838
Indirect business tax and nontax liability .....	.009	.010	.010	.011	.012	.013	.015	.016	.017	.019	.019	.020	.021	.022	.023	.025	.027	.028	.029	.029
Property-type income .....	.114	.120	.127	.135	.144	.157	.168	.181	.193	.204	.205	.221	.231	.239	.247	.259	.260	.274	.271	.279

NOTES.—Current-dollar cost per unit of real gross product originating (GPO) equals the GPO price index divided by 100.

Estimates for 1977–86 are shown on the basis of the 1972 Standard Industrial Classification (SIC). Estimates for 1987–96 are shown on the basis of the 1987 SIC.