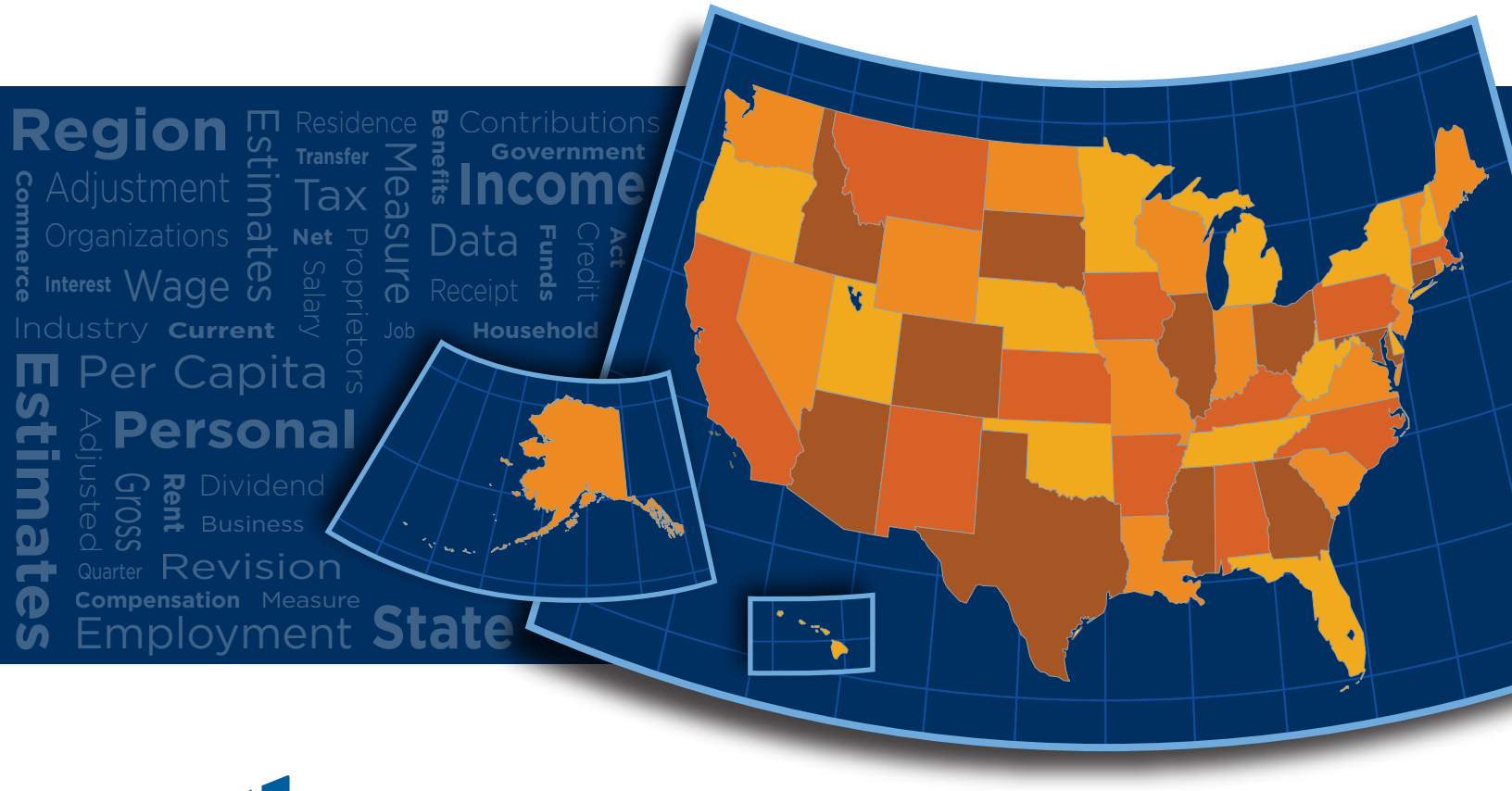
Gross Domestic Product by State: Concepts and Methods

Gross domestic product
for states and industries.

April 2025



bea
Bureau of Economic Analysis
U.S. DEPARTMENT OF COMMERCE

Gross Domestic Product by State: Concepts and Methods

Gross domestic product
for states and industries.

April 2025

U.S. Department of Commerce
Howard Lutnick
Secretary

Bureau of Economic Analysis
Vipin Arora
Director

301-278-9321
REIS@bea.gov
www.bea.gov

Contents

List of Figures and Tables

List of Abbreviations

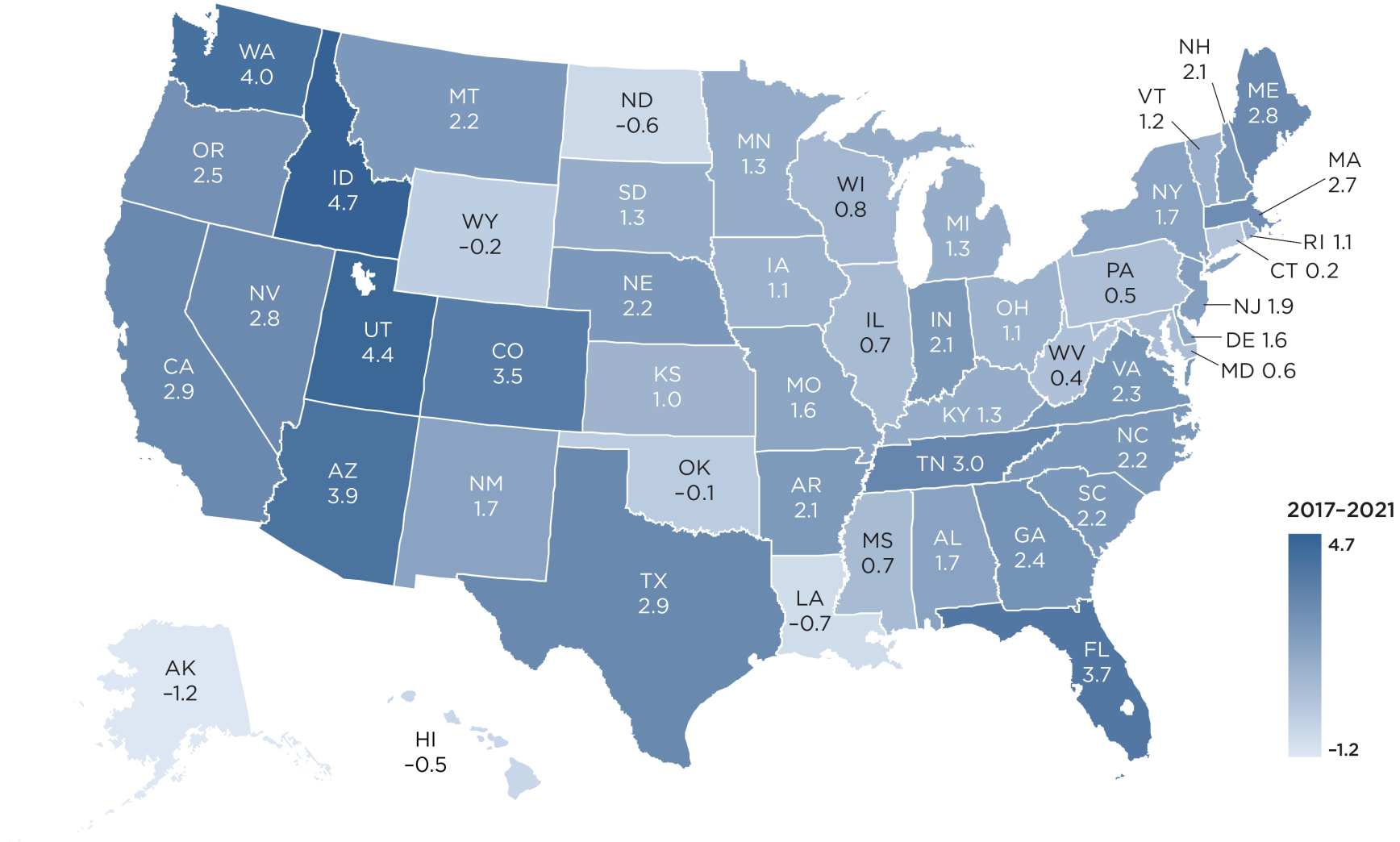
The following provides a comprehensive list of the abbreviations used in this document:

Abbreviation	Description
ACS	American Community Survey
BEA	U.S. Bureau of Economic Analysis
BLS	U.S. Bureau of Labor Statistics
BTP	Business transfer payments
CC	Corporate capital charges
CCA	Capital consumption allowance
CCAdj	Capital consumption adjustment
CFC	Consumption of fixed capital
COMP	Compensation of employees
DOT	U.S. Department of Transportation
EAO	Entertainment, literary, and artistic originals
FET	Federal excise tax
FI	Fixed investment
GDP	Gross domestic product
GOS	Gross operating surplus
HERD	Higher Education Research and Development
IIP	Imputed interest paid
IIR	Imputed interest received
IRS	Internal Revenue Service
IVA	Inventory valuation adjustment
MIP	Monetary interest paid
MIR	Monetary interest received
NAIC	National Association of Insurance Commissioners
NAICS	North American Industry Classification System
NIPAs	National Income and Product Accounts
NSF	National Science Foundation
PI	Proprietors' income (including CCA and IVA)
QCEW	Quarterly Census of Employment and Wages
R&D	Research and development
SIC	Standard Industrial Classification

Table continues

Abbreviation	Description
SNA 1993	*System of National Accounts 1993*
SPI	State personal income
SUB	Subsidiaries
TOPI	Taxes on production and imports
USDA	U.S. Department of Agriculture
USPS	United States Postal Service

Figure 1. Real GDP by State Growth, 2017–2022

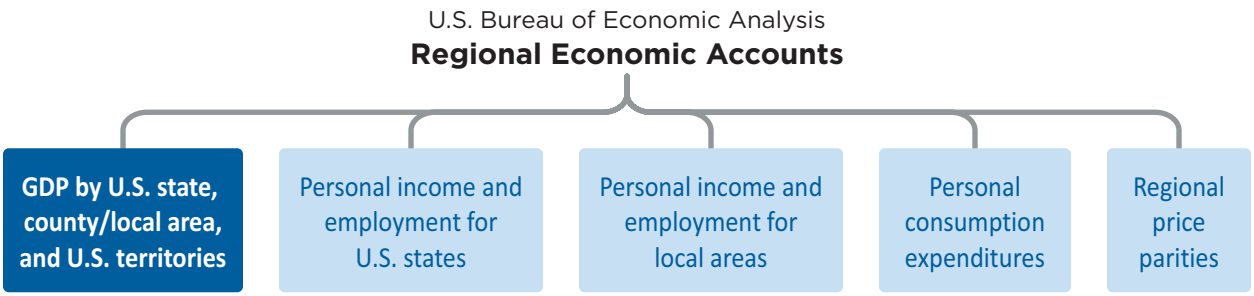


GDP Gross domestic product
U.S. Bureau of Economic Analysis

Part I. Introduction

1.1. This guide presents the conceptual framework, data sources, and statistical methods used by the Regional Income and Value Added Division of the U.S. Bureau of Economic Analysis (BEA) to estimate gross domestic product (GDP) by state.

Figure 2. U.S. Regional Economic Accounts



GDP Gross domestic product

U.S. Bureau of Economic Analysis

1.2. In May 1985, BEA published experimental estimates of GDP by state for years 1963, 1967, 1972, and 1977, culminating a research effort that began in 1982. The experimental estimates were built upon BEA's state personal income (SPI) accounts and its GDP by Industry Accounts.[1] Since then, BEA has continued improving its GDP by state estimates by incorporating additional source data, improving the underlying estimation methodology, and more closely integrating GDP by state with the national GDP by Industry Accounts and the National Income and Product Accounts.

1.3. The annual GDP by state series consists of estimates for 1997–2023 based on North American Industry Classification (NAICS) industries.[2] The GDP by state data are updated quarterly and revised annually with benchmark revisions occurring approximately every 5 years, in conjunction with major revisions in BEA's national estimates of GDP and GDP by industry.

1. For a discussion of the methodology used to compute SPI see *State Personal Income and Employment: Concepts and Methods*.
2. Archived estimates of GDP by state for 1963–1997 based on Standard Industrial Classification (SIC) industries are available. These estimates were last updated in 2010 with no plans for any future updates.

1.4. The GDP by state estimates are the state counterpart of the nation's GDP and as such provide a comprehensive measure of a state's production. GDP by state has many similarities to SPI but also many differences. Table 1 delineates the differences between GDP by state and SPI.

Table 1. The Relation of Sum-of-State GDP and Personal Income, 2022
[Billions of dollars]

Component	Sum-of-state GDP	Sum-of-state personal income
Compensation of employees	13,416.2	13,416.2
Plus: Taxes on production and imports less subsidies	1,722.2	...
Plus: Gross operating surplus[1]	10,720.7	...
Plus: Proprietors' income[2]		1,880.8
Equals: Earnings by place of work	...	15,297.0
Less: Contributions for government social insurance	...([3])	([4]) 1,702.1
Plus: Adjustment for residence[5]	...	4.2
Plus: Dividends, interest, and rent[6]	...	4,339.0
Plus: Personal current transfer receipts	...	4,139.1
Equals: Total	25,859.1	22,077.2

... Not available
GDP Gross domestic product

1. Gross operating suprlus includes consumption of fixed capital, proprietors' income with the inventory value adjustment (IVA) and the capital consumption allowance, rental income of persons with the capital consumption adjustment (CCAdj), corporate profits with the IVA and the CCAdj, and other mainly capital-related charges.
2. Proprietors' income includes the IVA and the CCAdj.
3. Contributions for government social insurance are included in GDP so they are not shown here.
4. Contributions for government social insurance are included in earnings by industry and earnings by place of work, but they are excluded from personal income.
5. The adjustment for residence is the net inflow of the earnings of interarea commuters. For the United States, it consists of adjustments for border workers and U. S. residents employed by international organizations and foreign embassies.
6. Rental income of persons includes the capital consumption adjustment. This component is included in gross operating surplus.

U.S. Bureau of Economic Analysis

1.5. The GDP by state estimates are used widely in both the public and private sectors. For example, the U. S. Department of the Treasury uses GDP by state in its calculation of a state's Total Taxable Resources and in formulas used to distribute federal grants among the states for the Community Mental Health Services Block Grant. GDP by state estimates are also used by consulting firms and universities for use in econometric forecasting models, by state revenue departments for budget planning, and by state and local economic development offices for attracting new businesses to their states.

1.6. The estimate of GDP for each state is derived as the sum of the GDP originating in all industries in the state. In concept, an industry's GDP by state, or its value added, is equivalent to its gross

output (sales or receipts and other operating income, commodity taxes, and inventory change) less the value of its intermediate inputs (consumption of goods and services purchased from other U. S. industries or imported). The sum-of-states GDP by state differs from GDP for the nation because:

1.7. GDP by state excludes, and the national GDP by Industry Accounts include, overseas activity—economic activity taking place outside the borders of the United States by the miliary and associated federal civilian support staff.[3]

1.8. For an accounting of the differences between sum-of-state GDP and the national GDP by Industry Accounts for a representative year, see appendix A.[4]

1.9. Although conceptually GDP by state can be thought of as gross output less intermediate inputs, there isn't sufficient data available to estimate in this way. Instead, GDP by state, like gross domestic income for the nation, is estimated using the income approach to estimating GDP because there is sufficient data available to produce estimates. The income approach involves measuring the income earned from the production of goods and services. This income can be earned by one of three factors of production, labor, capital, or government. For each industry, GDP by state is presented in four components:

1. Compensation of employees (COMP),
2. Taxes on production and imports (TOPI),
3. Subsidies (SUB), and
4. Gross operating surplus (GOS).[5]

1.10. The income earned by labor is compensation of employees, the income earned by capital such as corporate profits and depreciation is gross operating surplus, and the income earned by government is taxes on production and imports. The income earned by government is netted against payments to industry, that is, subsidies.

1.11. The estimates of GDP by state and its components for all private industries are consistent with national totals of the GDP by Industry Accounts and its components for all industries.

3. For SIC-based GDP by state estimates, there are additional differences between sum-of-states GDP by state and national GDP: (1) SIC-based GDP by state is consistent with gross domestic income, which differs from GDP by the statistical discrepancy, and (2) SIC-based GDP by state does not include intellectual property products.

4. See also the box, "Gross Domestic Product by Industry: Definition and Relationship to Gross Domestic Product and Other Measures of Output," in Robert J. McCahill and Brian C. Moyer, "Gross Domestic Product by Industry for 1999–2001," *Survey of Current Business* 82 (November 2002): 23.

5. Gross operating surplus is the sum of corporate profits, proprietors' income, rental income of persons, net interest, capital consumption allowances, business transfer payments, nontax payments, the current surplus/deficit of government enterprises, and fixed investment (research and development and entertainment, literary, and artistic originals are estimated separately). Proprietors' income includes some portion of labor compensation that should be included in the employee compensation component of GDP by state, but it is not possible to separate the labor share of proprietors' income from the capital share.

1.12. GDP by state estimates are prepared for NAICS-based industries (appendix B). For estimation purposes, these industries are divided into two groups: goods-producing industries and services-producing industries. In general, there are two procedures for estimating GDP by state and its components. One uses state-level U.S. Census Bureau value-added data for the goods-producing industries to estimate GDP by state for these industries, and the other utilizes Census Bureau receipts and payroll data, or company financial data, to estimate GOS for the services-producing industries.

1.13. For goods-producing industries, except farms, GDP by state excluding fixed investment (FI) for intellectual property products (IPP)—research and development and entertainment, literary, and artistic originals—is computed as Census Bureau value added, adjusted to BEA's concept of value added. For farms, data on farm expenditures and receipts from the U.S. Department of Agriculture are used to compute value added for the industry. The GOS income component for goods-producing industries is computed as a residual:

$$GOS = GDP_{s\,(w/o\ FI)} + FI - (COMP + TOPI - SUB).$$

1.14. For services-producing industries, Census Bureau receipts and payroll data or company financial data are used to estimate the GOS income component excluding IPP. GDP by state is the sum of the estimated income components:

$$GDP_S = COMP + TOPI - SUB + GOS_{(w/o\ FI)} + FI.$$

1.15. The other income components for calculating GDP by state (compensation of employees, taxes on production and imports, and subsidies) are estimated separately for each industry.

1.16. The GDP by state estimates are prepared in current and chained (real) dollars. Real GDP by state is an inflation-adjusted measure that is based on national prices for the goods and services produced within each state.

1.17. The purpose of this document is to provide readers with a more detailed description of the sources and methods used by BEA to prepare its estimates of GDP by state than is publicly available elsewhere. Parts II–V describe the data and methods used to estimate compensation of employees, taxes on production and imports, subsidies, and gross operating surplus. Part VI shows the calculation of chained-dollar GDP by state. Part VII shows the calculation of quarterly GDP by state. Part

VIII presents supplemental technical details about how the GDP by state estimates are prepared. Finally, a series of tabular appendices gives information about the industries for which GDP by state estimates are prepared and the source data used to prepare the estimates.

1.18. A document of this length cannot provide a complete enumeration of all the steps involved in estimating GDP by state. While some technical details may be omitted or summarized, the methodological descriptions presented cover all the important steps included in the GDP by state estimation process. The discussion is essentially nonmathematical, to a reasonable extent, with algebra and equations introduced only where necessary or segregated in technical notes at the end of this document.

Part II. Compensation of Employees

2.1. Compensation of employees is the largest component of GDP by state, typically accounting for about three-fifths of U.S. GDP by state. Compensation of employees is estimated as the sum of two components: wages and salaries and supplements to wages and salaries.

Wages and Salaries

2.2. The GDP by state estimate of wages and salaries is used directly from the wages and salaries estimated as part of BEA's state personal income (SPI) accounts.[6] The sum-of-state wages and salaries estimates are reconciled with the national GDP by Industry Accounts estimates.

2.3. GDP by state wages and salaries, and the SPI accounts on which they are based, exclude the wages and salaries of federal military and civilian personnel stationed overseas because their contribution to GDP is not geographically located within a state.

Supplements to Wages and Salaries

2.4. Supplements to wages and salaries include employer contributions for employee pension and insurance funds and employer contributions for government social insurance.

6. Wages and salaries include the monetary remuneration of employees and the compensation of corporate officers. It also includes commissions, tips and bonuses, voluntary employee contributions to certain deferred compensation plans—such as 401(k) plans, and receipts in kind that represent income.

Employer Contributions for Employee Pension and Insurance Funds[7]

2.5. The SPI estimate of employer contributions for employee pension and insurance funds is used directly in the GDP by state statistics; no adjustments are required. The estimate excludes the employer contributions for federal civilian and military personnel stationed overseas. The sum-of-state estimates are reconciled with the national GDP by Industry Accounts estimates.

Employer Contributions for Government Social Insurance[8]

2.6. The SPI estimate of employer contributions for government social insurance is used directly in the GDP by state statistics; no adjustments are required. The estimate excludes the contributions for federal civilian and military personnel stationed overseas. The sum-of-state estimates are reconciled with the national GDP by Industry Accounts estimates.

7. Employer contributions for employee pension and insurance funds consist of employer payments to private pension and profit-sharing plans, private group health and life insurance plans, privately administered workers' compensation plans, supplemental unemployment benefit plans, corporate directors' fees, and several minor categories of employee compensation, including judicial fees to jurors and witnesses, compensation of prison inmates, and marriage fees to justices of the peace.

8. Employer contributions for social insurance consist of employer payments under the following federal and state and local government programs: Old-Age, Survivors, and Disability Insurance (Social Security); hospital insurance; unemployment insurance; railroad retirement; pension benefit guaranty; veterans life insurance; publicly administered workers' compensation; military medical insurance; and temporary disability insurance.

Part III. GDP by State for Goods-Producing Industries

3.1. The private goods-producing industries are farms, mining, construction, and manufacturing. For these industries, BEA estimates GDP by state excluding IPP, compensation of employees, proprietors' income with inventory valuation adjustment (IVA) and capital consumption allowance (CCA), subsidies, and taxes on production and imports (TOPI).[9, 10] The corporate capital charge component of the gross operating surplus is then computed as a residual.

3.2. For farms, the GDP by state estimates are based on the difference between farm receipts and farm expenses from the U.S. Department of Agriculture.[11] For mining, construction, and manufacturing, the GDP by state estimates are based on value added from the quinquennial economic censuses (years ending in "2" and "7"), although the census data must be adjusted to conform to BEA's definition of value added.

3.3. Manufacturing, construction, and mining industries value-added data from the Census Bureau include the value of purchased services, which BEA treats as an intermediate cost of production and not as a part of value added. The Census Bureau data are adjusted to remove the cost of purchased services.[12] The national ratio of purchased services to value added by industry, derived from national GDP by Industry Accounts KLEMS data, is used to estimate and remove the value of purchased services in the Census Bureau's state manufacturing value added measure, to yield an estimate of value added by state and industry.

9. The forestry, fishing, and related activities industry, which is part of agriculture, forestry, fishing, and hunting, is estimated like a services-producing industry described later in this document.

10. The IVA is an adjustment to put inventories on BEA's concept (replacement cost) from the way inventories are reported for income tax purposes (business cost). The CCA consists of depreciation charges and accidental damage to fixed capital.

11. Farm income is the sum of cash receipts, other farm income, and inventory change. Farm expenses include the purchase of the following goods and services: feed, livestock, seed, fertilizer and lime, petroleum products, veterinary services, pesticide, rental expense of nonoperator landlords, equipment operation and repair, electricity, and miscellaneous expenses.

12. The major commodity groups included in purchased services are communications, finance, insurance, real estate, and services. Only that portion of wholesale trade attributable to sales branches and offices, i.e., nonmargin output, is treated as purchased services.

3.4. After removing the cost of purchased services from the Census Bureau value-added data, an additional adjustment is made to account for differences in industry coverage and classification between the Census Bureau and BEA. The adjusted Census Bureau value-added data are multiplied by the ratio of BEA wages and salaries to Census Bureau payrolls by state and industry. This is done on the assumption that the ratio would be 1 if there were no differences in coverage and classification of establishments between the two data series.

3.5. For the construction industry, additional definitional adjustments are made to the Census Bureau value-added data:

- BEA removes rental payments for machinery and equipment because these payments are treated as an intermediate expense by BEA.
- After the previous adjustment, an adjustment is made to account for the value added generated by construction firms without payrolls, based upon the ratio of "value of construction work for all firms" divided by "value of construction work for firms with payrolls," as measured by the Census Bureau.
- Finally, the adjusted value added is multiplied by the ratio of "value of construction work by location" to "value of construction work by establishment" to reassign the adjusted value added from the state where the construction establishment is located to the state where the construction work is performed.

3.6. After adjusting Census Bureau value-added data, the sum-of-state adjusted value added for the mining, construction, and manufacturing industries is reconciled with the national GDP by Industry Accounts value added, excluding federal excise taxes (FETs) for the nation, yielding estimates of GDP by state, excluding FETs for the state. GDP by state is then computed by adding estimates of FETs by industry and state. Corporate capital charges (CC) by industry and state are then computed by subtracting employee compensation, taxes on production and imports less subsidies, and proprietors' income with IVA and CCA (PI) from GDP by state:

$$CC = GDP_{(w/o\ IPP)} - COMP - (TOPI - SUB) - PI.$$

3.7. The GDP by state estimates for goods-producing industries use different source data and estimation techniques for years not covered by economic censuses. For the detailed manufacturing industries, value-added data from the Census Bureau are used to produce the GDP by state estimates using an estimation methodology similar to that used in the benchmark years. For the detailed industries within the mining sector, value-of-production data for each mining industry are used to extrapolate or interpolate GDP by state values. For construction, state personal income earnings by place of work estimates are used as the industry extrapolation or interpolation series for construction GDP by state.

Part IV. Taxes on Production and Imports Less Subsidies

4.1. Taxes on production and imports (TOPI) consists of tax liabilities, including taxes on sales, property, and production, that can be charged to business expense in the calculation of profit-type income. TOPI does not include employer contributions for government social insurance, which are included in employee compensation. Moreover, TOPI does not include corporate income taxes, because these taxes cannot be calculated until profits are known and therefore cannot be considered a cost of production.

TOPI Except Property Taxes

4.2. TOPI is estimated as the sum of federal excise taxes and state and local taxes, of which the two largest—general sales and gross receipts taxes and property taxes—account for about 60 percent of TOPI nationally (appendix C). The national measure for each tax, except general sales and gross receipts taxes, is distributed to states by industry using tax receipts from the Census Bureau's state and local government finances or other appropriate state indicator series.

4.3. For general sales and gross receipts taxes, information is often available from state tax collection reports about the distribution of the taxes by industry and state. However, the industry detail reported by states varies, so data from state tax reports are aggregated or disaggregated as required, on the basis of the industry distribution of employee compensation, to conform to the industries for which the GDP by state estimates are prepared. When the total sales and gross receipts taxes from individual state tax collection reports differ from the state totals reported to the Census Bureau, the Census Bureau value is assumed to be more reliable, and the industry estimates are made consistent with the published census values.

4.4. The GDP measures of the remaining TOPI components are distributed to the states using one of the following two methods depending on whether the tax is paid by just one or by several industries:

1. When the tax is paid by a single industry, the Census Bureau measure of the tax receipts by state, if available, is used as the indicator series to distribute the national GDP by Industry Accounts value to the states. If a Census Bureau measure is not available, a related state indicator is used to allocate the national GDP by Industry Accounts value to the states (appendix C).
2. When the tax is paid by two or more industries, a dual allocation procedure is used. First, the industry distribution of BEA's compensation of employees, by state, is employed to distribute the Census Bureau's measure of the state's total collection of the tax to the industries in each state. Second, the resulting industry distribution by state is used to distribute the national GDP by Industry Accounts value of the tax to the states.[13]

Property Taxes

4.5. Property tax estimates begin with Census Bureau tax receipts data, although these data need to be adjusted to BEA's concept. First, the Census Bureau "total" property taxes are adjusted, by state, to remove BEA's estimates of personal property taxes, which are part of state personal income but not GDP by state. Second, property taxes for farms and nonoperator landlords of farms, available from the U.S. Department of Agriculture, are subtracted, leaving estimates of property taxes paid by nonfarm businesses and by residential housing, by state. Third, this total is multiplied by the state's ratio of residential assessments divided by total nonfarm assessments to estimate residential housing property taxes, which are also subtracted from the Census Bureau measure of property taxes.[14] Property taxes on farms are assigned to the farming industry, except for property taxes on the farms of nonoperator landlords and on residential housing, which are assigned to the real estate industry. The remaining property taxes (on nonfarm and nonresidential businesses) are allocated to national GDP by Industry Accounts industry totals and to state property tax totals according to the state and industry distributions of BEA's estimate of compensation of employees.

13. For additional information on dual allocation, see "Allocation Procedures" and "Dual Allocation" in "Part VIII. Technical Notes."

14. The Census Bureau discontinued reporting assessed values by property use class following the 1987 Census of Governments.

Subsidies

4.6. Subsidies, which are government transfers to business, increase profits before taxes while not reflecting any production. Accounting for the value of production, therefore, requires that the value of subsidies be removed from GDP. Generally, subsidies occur in just a few industries, and for each industry, a national GDP by Industry Accounts subsidies total is distributed to the states by means of an indicator series:

- Crop and animal production ("farms") subsidies are allocated on the basis of each state's share of total GDP by state for the industry.[15]
- Utilities subsidies are allocated to California only for 2001–2003. The subsidies are due to California companies being overcharged for electricity consumption.
- Air transportation subsidies are estimated on the basis of company financial data. Because an airline may operate in one state or in many states, and because air transportation subsidies are related to passenger transportation and not to freight transportation, some adjustments are needed to develop an indicator series that can be used to allocate the airline subsidies to the correct states:
  - » The ratio of each airline's passenger revenue to total revenue is computed to indicate the degree to which each airline is engaged in passenger versus freight transportation.
  - » The ratio of passenger enplanements by state to total passengers is computed to indicate the state distribution of each airline's passenger transportation.
  - » The product of these two ratios (computed in the first two steps) is then multiplied by airline subsidies by company to yield an estimate of airline subsidies by state and company.
  - » The estimates from step 3 are summed for all airline companies in each state to yield an estimate of air transportation subsidies by state.
  - » Finally, the state distribution computed in step 4 is used to distribute the GDP by industry national total for airline transportation subsidies to the states.
- Rail transportation subsidies are allocated to the states on the basis of data on rail subsidies by state, available from the Census Bureau.
- For the remaining industries that have subsidies (water transportation, other transportation and support activities, and banking), the national subsidies total by industry is distributed to the states on the basis of each state's share of industry corporate capital charges.

15. Because farms is a goods-producing industry, GDP by state is estimated directly; therefore, GDP by state is available for use as an indicator series in the estimation of subsidies.

Part V. Gross Operating Surplus

5.1. Gross operating surplus (GOS) consists of proprietors' income with inventory valuation adjustment (IVA) and capital consumption allowances (CCA) and other corporate capital charges (CC). CC consists of rental income of persons and CCA, corporate profits before tax with IVA and CCA, consumption of fixed capital (CFC), net interest, business transfer payments, nontax payments to general government agencies that are treated like taxes, and the current surplus of government enterprises.[16, 17] For goods-producing industries where total GDP by state excluding IPP is estimated directly from Census Bureau value-added data, corporate capital charges are computed as the difference between GDP by state and the other income components. For services-producing industries, BEA estimates corporate capital charges and computes GDP by state by summing the income components:

$$GOS = PI + CC,$$

$$GDP_{(w/o\ IPP)} = COMP + (TOPI - SUB) + GOS.$$

5.2. The GOS data and estimation methods for services-producing industries vary among industries and between economic census (benchmark) and noneconomic census years (nonbenchmark) estimation cycles to accommodate the availability of source data.[18] This section focuses on GOS benchmark estimation methods because they are more complex than the methods used for nonbenchmark years, which typically rely upon extrapolations and interpolations of benchmark estimates using a related data series such as wages and salaries.

16. The rental income of persons, which is included as part of GDP by state for the real estate industry, includes the imputed rental income received by the owner-occupants of farm and nonfarm dwellings, which is an estimate of the net return to home ownership.
17. Nontax payments generally exclude business purchases from general government agencies of goods and services that are similar to those provided by the private sector and the current surplus of government enterprises.
18. Benchmark years are the years for which data from the economic census are available: 1997, 2002, 2007, 2012, and 2017.

Proprietors' Income

5.3. For all industries except farms, mining, and real estate, the GDP by state estimates of proprietors' income with IVA and CCA are based on state personal income (SPI) accounts data on proprietors' income with IVA and CCAdj. Two adjustments are made to the SPI proprietors' income measure to make it consistent with the GDP definition of proprietors' income, which includes CCA not CCAdj:

$$\text{PI for GDP} = \text{PI for SPI} - \text{CCAdj} + \text{CCA},$$

where:

PI for GDP = GDP by state proprietors' income,

PI for SPI = proprietors' income from the SPI accounts,

CCAdj = noncorporate capital consumption adjustment, and

CCA = noncorporate capital consumption allowance.

5.4. CCA must be added to the proprietors' income component of GDP by state because it is a cost of production, but CCA is not included in the SPI measure of proprietors' income.

5.5. Both of these adjustments to the SPI measure of proprietors' income with IVA are made on the basis of nonfarm proprietors' income reported to the Internal Revenue Service (IRS). The national GDP by Industry Accounts total of proprietors' capital consumption adjustment (CCAdj) by industry is removed, and the national GDP by Industry Accounts total of CCA by industry is added to the SPI measure on the basis of each state's share of the sum of the absolute values of IRS reported nonfarm proprietors' income.[19]

Farm proprietors' income

5.6. For farms, the proprietors' income estimates are based on BEA's SPI proprietors' income with IVA and CCAdj. Like the industries above, the CCAdj must be removed from farm proprietors' income and CCA included. The estimates for CCA are based on the SPI measure of farm depreciation. However, the SPI measure of farm depreciation includes both corporate and noncorporate (proprietors') depreciation. Farm depreciation by state is split into corporate and noncorporate parts based on the corporate and noncorporate composition of farm income by state. Then, each state's share of national noncorporate farm depreciation is used to distribute the national GDP by Industry Accounts estimates of CCA and CCAdj to the states. Finally, the state estimates of CCAdj are subtracted from and the estimates of CCA are added to the SPI farm proprietors' income to yield farm proprietors' income with IVA and CCA.

19. Absolute values are used because reported proprietors' income is occasionally negative, but it is the magnitude of the reported income, regardless of its sign, that is indicative of a level of activity.

Mining proprietors' income

5.7. For the mining industries, BEA's SPI measure of proprietors' income with IVA is not used, because it includes income earned from limited partnerships, which the IRS tabulates as being earned in the state where the income recipient resides rather than in the state where the income is produced. For the mining industries, the state shares of GDP by state for the nation, excluding proprietors' income with IVA and CCA, are used to allocate the national GDP by Industry Accounts measure of proprietors' income with IVA and CCA to the states.

Real estate proprietors' income

5.8. Similar to the mining industries, BEA's SPI measure of proprietors' income with IVA for the real estate industry is not used because it includes income earned from limited partnerships, which is tabulated by the IRS as being earned in the state where the income recipient resides rather than in the state where the income is produced.. The "Real estate" subsection includes a complete discussion of how proprietors' income is computed for this industry.

Corporate Capital Charges

5.9. GOS is the sum of proprietors' income (with IVA and CCA) and corporate capital charges. The estimation of the proprietors' income component of GOS has been described above. This section describes the benchmark year methodologies for estimating the capital charge components of GOS: rental income of persons and CCA; corporate income components (corporate profits with IVA and CCA, CFC, net interest, and business transfer payments); certain other nontax payments (or liabilities) to general government agencies that are treated like taxes; and the current surplus of government enterprises. Benchmark (economic census) years are those for which the corporate capital charge estimates rely most heavily on state-specific source data rather than on extrapolation or interpolation using a related indicator series (appendix D). The corporate capital charge benchmark methods are discussed in terms of goods-producing industries, services-producing industries, and government because of the similarities within each of these groups with respect to estimation methodologies and source data.

Nontax payments to government

5.10. Nontax payments to government consist of various items such as regulatory and inspection fees, fines and forfeitures, rents and royalties, and donations (appendix E). For farms, the estimates are based on each state's share of federal grazing receipts from permits and leases data from the U.S. Department of the Interior. For oil and gas extraction, the estimates are based on each state's share of rents and royalties data from the Department of the Interior. For banking, the estimates are based on each state's share of Federal Reserve Bank assessments from the Federal Reserve Board. For industries other than those just described, the estimates are based on each state's share of unpublished wages and salaries from BEA.

Services-Producing Industries

5.11. Services-producing industries consist of all industries except farms, mining, construction, manufacturing, and government. All the remaining industries are private services-producing industries. For these industries, GOS is estimated in three components:

1. proprietors' income with IVA and CCA (PI),
2. nontax payments to government, and
3. corporate capital charges.

5.12. The data and methods used to estimate proprietors' income with IVA and CCA and nontax payments to government were described above. The rest of this section describes the methods for estimating corporate capital charges for services-producing industries.

5.13. For most services-producing industries, GDP by state corporate capital charge estimates are based upon receipts and payroll data from the Census Bureau's quinquennial economic census and upon BEA wages and salaries data. The exceptions to this approach are mainly regulated industries for which additional company financial data are available and for which alternative estimation methods have been developed.[20] These exceptions to the standard methodology will be treated separately below. The standard methodology uses an indicator data series to distribute the national GDP by Industry Accounts corporate capital charge total to the states. The indicator series is defined as the sum of BEA wages and salaries and Census Bureau receipts, after the Census receipts data have been adjusted (by the ratio of BEA wages and salaries to Census payrolls) to account for differences in establishment coverage and industry-establishment classification between Census and BEA:

$$Z_{i,j} = 0.5 \times WS_{i,j} + 0.5 \times (WS_{i,j} / CP_{i,j}) \times CR_{i,j},$$

where:

$Z_{i,j}$ = the indicator series for industry i in state j,

$WS_{i,j}$ = BEA wages and salaries for industry i in state j,

$CP_{i,j}$ = Census payrolls for industry i in state j, and

$CR_{i,j}$ = Census receipts for industry i in state j.

20. The exceptions to the standard capital charge estimation methodology are utilities, air transportation, rail transportation, banking, insurance carriers, real estate, and government.

5.14. The values of the indicator series are summed across the states for an industry, and then the national GDP by industry total for corporate capital charges in the industry is distributed to the states on the basis of each state's share of the indicator series total. This estimate of corporate capital charges is then added to estimated nontax payments and proprietors' income with IVA and CCA by state to yield the estimate of GOS for each industry. The estimates of GOS are then added to estimates of employee compensation, taxes on production and imports (TOPI), and subsidies to yield the estimate of GDP by state for each industry.

Utilities

5.15. BEA estimates corporate capital charges by state for three subindustry groups within the utilities industry: natural gas distribution; electric power generation, transmission, and distribution; and water sewage and other systems.[21] National GDP by Industry Accounts corporate capital charge components for the utilities industry are distributed to the three subindustry groupings based on each subindustry group's share of the selected financial measures for utilities. These national total corporate capital charges for each of the three subindustry groups are then distributed to the states on the basis of indicator data series specific to each of the groups.

5.16. ***Natural gas distribution.*** The natural gas distribution portion of utilities industries' corporate capital charges is distributed to the states on the basis of each state's share of natural gas delivered to consumers from the Energy Information Administration.

5.17. ***Electric power generation, transmission, and distribution.*** For electric power generation, transmission, and distribution, a four-step procedure is used to take advantage of selected financial data for each company:

1. Selected financial items from each company's income statement and balance sheet are redefined to conform to BEA conventions and definitions.[22]
2. The redefined measures are distributed to the states in which the company operates based on each state's share of the company's total generating capacity.
3. The adjusted and distributed measures from step 2 are summed across companies, by state, and used as the indicator series to distribute to the states the respective national GDP by Industry Accounts capital charge component—net interest, corporate CCA, and corporate profits with IVA.
4. The remaining income component—business transfers—is distributed to states using the state distribution of company revenues as an indicator series.

21. The North American Industry Classification System (NAICS) utilities industry includes natural gas distribution, while natural gas transmission is included in the NAICS pipeline transportation industry. The Standard Industrial Classification (SIC) utilities industry includes both natural gas distribution and natural gas transmission.

22. For additional information, see "Adjustments to Financial Items of Utilities Companies" in "Part VIII. Technical Notes."

5.18. Nontax payments are estimated separately and added to the corporate capital charges estimates.

5.19. ***Water, sewage, and other systems.*** For the corporate capital charges component of corporate profits with IVA and CCA, the national GDP by Industry Accounts total is distributed to the states using equally weighted Census Bureau receipts (adjusted by the ratio of BEA wages and salaries to Census payrolls) and BEA wages and salaries, like most other services-producing industries. The corporate capital charges components of net interest and business transfer payments are distributed to the states based on each state's share of BEA wages and salaries for the industry.

Air transportation

5.20. BEA uses passenger enplanements, by company and airport, and airline financial data, by company, from the U.S. Department of Transportation (DOT) to estimate air transportation corporate capital charges by state.[23, 24] The passenger enplanements data is used to determine passenger load factors for flights. Then, the passenger load factors are combined with the financial data to determine the profitability of flights. Flight profitability is aggregated by airport, then by state. The resulting state distributions of the financial measures are then used as an indicator series to distribute the national GDP by Industry Accounts corporate capital charge components to the states.[25]

Rail transportation

5.21. BEA estimates state rail corporate capital charges as the sum of corporate capital charges for Class I railroads, Class II railroads, and Amtrak.[26] Accordingly, the national GDP by Industry Accounts corporate profits with IVA, CCA, net interest, business transfer payments, and current surplus are split among the three types of railroads before being distributed to the states.

5.22. The Amtrak portion of the national GDP by Industry Accounts capital charge components is based on the company's reported profit (or loss), depreciation, and interest expense. The Amtrak portion of the rail transportation industry's corporate capital charges is distributed to the states on the basis of Amtrak passenger boardings by state.

23. The following DOT data, by company, are used: total property revenue plus mail revenue, total passenger revenue, subsidies, interest on long-term debt and capital leases plus other interest expense, depreciation and amortization, and net income (or loss) before taxes.

24. This NAICS industry differs significantly from the similarly named SIC industry, transportation by air. Along with several minor differences, large portions of the SIC industry, including courier services such as Federal Express, are not included in the NAICS industry. These differences may be especially large in states that serve as hubs to courier service operations.

25. Net income (or loss) before income taxes plus depreciation and amortization is used to allocate GDP profits with IVA plus CCA; interest on long-term debt plus other interest expense is used to allocate net interest. The national GDP by Industry Accounts measure of business transfer payments is allocated to states on the basis of passenger enplanements by state.

26. Class I railroads are those with annual gross revenues of more than $250 million, and Class II railroads are those with annual gross revenues of $20–$250 million.

5.23. After subtracting the Amtrak portion from the GDP by industry total for railroad transportation corporate capital charges, the remainder is split between Class I and II railroads based on the expense, revenue, and profit shares of each class:[27]

- For Class I railroads, corporate CCA is distributed to states on the basis of the state shares of national structure and equipment depreciation; profits with IVA and business transfers are distributed to the states on the basis of the state shares of net revenue; net interest is distributed to the states on the basis of the state shares of interest expense.
- For Class II railroads, corporate CCA and net interest, business transfer payments, and corporate profits with IVA are distributed to the states on the basis of state shares of Class II expenses, revenues, and profits, respectively.

5.24. The GDP by state estimate for rail transportation capital charge components by state is then the sum for each state of the estimated corporate capital charges for Amtrak, Class I, and Class II railroads.

Insurance carriers and related activities

5.25. Corporate capital charges for insurance carriers and related activities are estimated in two parts: insurance carriers, life insurance, property and casualty insurance; and insurance agents, brokerage, and related activities (which, for simplicity, will be referred to as "insurance agents"). The sum of corporate capital charge estimates for these two parts yields the corporate capital charges estimate for the industry in each state. The national GDP by Industry Accounts total corporate capital charges for the two parts of the industry are obtained as a special tabulation from the GDP by Industry Accounts. These national totals are then distributed to the states on the basis of state-level insurance industry data obtained from the National Association of Insurance Commissioners (NAIC).

5.26. ***Insurance carriers.*** The national corporate capital charges total for insurance carriers is distributed to the states in three parts:

1. The national GDP by Industry Accounts total for corporate profits with IVA is distributed to the states on the basis of each state's share of the total NAIC net premiums for insurance carriers, where "net premiums" are measured as total premiums minus losses.
2. The national GDP by Industry Accounts total for net settlements (actual losses less expected losses) is distributed to the states on the basis of each state's share of total NAIC losses as reported by the insurance carriers. When the national value of net settlements is negative, and the reported NAIC loss is also negative, the absolute value of the loss is used as the indicator value for net settlements for the state.

27. The financial measures (expenses, revenues, and profits) are special tabulations based on waybill data, by state, and company financial reports from DOT. For Class I railroads, DOT provides net income before taxes, depreciation and amortization expense, interest expense, and total revenues, by company and state. For Class II railroads, DOT provides total revenues, expenses, and profits, by state. The difference between the total Class I depreciation reported by DOT and the estimated Class I CCA is added to the Class I profits reported by DOT and subtracted from the Class I depreciation reported by DOT in order to account for differences between financial accounting and national income accounting.

3. The national GDP by Industry Accounts total for corporate capital charges except profits and net settlements is distributed to the states on the basis of each state's share of total NAIC premiums paid for insurance carriers.

5.27. The insurance carriers corporate capital charges assigned to each state is then the sum of the three parts. The data on premiums, settlements, profits, and losses are recorded in the home state of the insurance underwriter, not in the home state of the insured.

5.28. ***Insurance agents.*** The national GDP by Industry Accounts corporate capital charges total for insurance agents is distributed to the states on the basis of each state's share of NAIC total insurance premiums, recorded on a "where-sold" basis. Using insurance premiums on a "where-sold" basis serves to locate the economic activity in the home state of the insurance agents, rather than the home state of the underwriters of the insurance.

Credit Intermediation ("Banking")

5.29. Federal Reserve Banks and depository and nondepository institutions comprise the credit intermediation industry. While all types of institutions are included, this discussion focuses on depository institutions, whose output is the most complex to estimate.

5.30. The operating income of depository institutions (hereafter referred to as "banks") roughly equals interest received minus interest paid and other expenses. Banks act as financial intermediaries for depositors and borrowers by granting loans with available funds from bank deposits and by maximizing the interest income earned from reinvestment of deposits and loan repayments. Financial intermediation is a service to depositors and borrowers that is not explicitly priced and must be indirectly valued. The next sections review the quantification of these implicit services as part of bank net interest and describe the data used to compute the other components of corporate capital charges (profit, corporate capital consumption allowance, and business transfer payments).

Net interest

5.31. The National Income and Product Accounts (NIPAs) recognize that both the interest paid to depositors and the interest received from borrowers have two forms of payment: a monetary amount and an imputed value for implicit services provided by the bank. The *System of National Accounts 1993* (*SNA 1993*) recommended that the value of implicit services be computed using a "reference rate" of

Financial intermediation is the implicit service of using funds from deposits to acquire financial assets by making loans and/or purchasing securities, while assuming financial risk, and channeling funds from lenders to borrowers and transforming or repackaging the funds with respect to maturity, scale, and risk.

interest that represents the opportunity cost of borrowing or lending and does not include a risk premium or any intermediation services. In agreement with the NIPAs and *SNA 1993*, the regional product accounts estimate the four gross interest flows for commercial banks by state: monetary interest paid (MIP), imputed interest paid (IIP), monetary interest received (MIR), and imputed interest received (IIR). Therefore, net interest earned by commercial banks equals the sum of monetary and imputed interest paid, less the sum of monetary interest received and imputed interest received:

$$\text{Net interest} = (\text{MIP} + \text{IIP}) - (\text{MIR} + \text{IIR}).$$

5.32. Net interest for the credit intermediation industry equals the sum of net interest from each type of institution: commercial banks, savings and loan associations, savings banks, credit unions, Federal Reserve banks, and nondepository institutions. The difference between the sum of net interest by state and the NIPA value is distributed to the states based on the computed series of net interest by state. The next subsections discuss the computation of net interest by type of institution.

5.33. ***Commercial bank net interest***. Monetary interest paid is distributed to each state with domestically located commercial bank deposits. The state distribution of commercial bank interest income is used to distribute national monetary interest received to the states. Imputed interest paid by banks to depositors equals the reference rate, less the interest rate received by depositors, multiplied by average deposit liabilities. Similarly, imputed interest received by banks from borrowers equals the interest rate paid by borrowers, less the reference rate, multiplied by average earning assets.

5.34. ***Savings institutions net interest.*** The state distribution of savings institutions (savings and loan associations and savings banks) deposits is used to distribute national net interest for both types of institutions to the states. The reference rate approach may be applied to savings institutions as a part of a future benchmark revision in methodology. The computations would be similar to those employed to compute commercial bank net interest.

5.35. ***Federal Reserve banks net interest.*** Federal Reserve banks do not pay monetary interest. Therefore, net interest for each state with a Federal Reserve bank equals monetary interest received. (The value of implicit services, net of the opportunity cost of required deposits, is assumed to be zero for Federal Reserve banks.[28])

5.36. ***Nondepository institutions net interest.*** Nondepository net interest for economic census years is distributed to each state using an equal weighting of Census Bureau receipts and SPI wages and salaries. These estimates are extrapolated or interpolated with the annual percent change in wages and salaries to compute nondepository net interest for noneconomic census years.

28. Under the National Bank Act of 1863, national banks are required at all times to maintain specified reserves based on the level of deposits in the bank.

Profits before taxes

5.37. ***Depository profits.*** The NIPAs include profits estimates for the following types of banking institutions: Federal Reserve banks, commercial banks, savings and loan associations, savings banks, Federal Home Loan Banks, credit unions, bank holding companies, and nondepository institutions. With the exceptions of credit union and bank holding company profits, the sum of net operating income and allowance for loan and lease losses by state provides the information necessary to distribute the NIPA national profits estimates to the states by type of institution. (The state distribution of compensation of employees is used to distribute national credit union profits to each state.) The financial data for commercial banks, savings and loan associations, and savings banks are adjusted to account for banks that operate branch banks in a different state (interstate branching). Bank holding company profits from the NIPAs are distributed to each state using bank holding company profits by state.

5.38. ***Nondepository profits.*** For economic census years, the value of nondepository profits from the NIPAs is distributed to the states using an equal weighting of Census Bureau receipts data and SPI wages and salaries. For noneconomic census years, nondepository profits estimates are computed by extrapolating or interpolating economic census year's values using the annual percent change in SPI wages and salaries.

CCA and business transfer payments for depository and nondepository institutions

5.39. ***Depository CCA and business transfer payments (BTP)***. The remaining corporate capital charges components consist of corporate CCA and BTP. The national value of the CCA and BTP components of capital charges are distributed to the states in two parts: Federal Reserve and all other depository institutions. Federal Reserve bank CCA is depreciation on land and equipment and is assigned to the states where it is reported. BTP is assumed to apply to only non-Federal Reserve banks. BTP and CCA from the NIPAs, less the Federal Reserve bank CCA, are distributed to all institutions, except Federal Reserve banks, using the state distribution of compensation of employees.

5.40. ***Nondepository CCA and BTP.*** For economic census years, the value of nondepository CCA and BTP from the NIPAs is distributed to the states using an equal weighting of Census Bureau receipts data and SPI wages and salaries. For noneconomic census years, nondepository CCA and BTP estimates are computed by extrapolating or interpolating economic census year values using the annual percent change in SPI wages and salaries.

Total capital charges for depository and nondepository institutions

5.41. The total state corporate capital charges for depository and nondepository institutions, excluding nontax payments to government, equals the sum of profits, CCA, BTP, and net interest for each institution. To ensure consistency with the national accounts, the difference between the sum-of-states estimates and the national corporate capital charges value is distributed to the states based on the estimates of the state corporate capital charges.

Real estate

5.42. The GOS estimates methodology for the real estate industry takes advantage of the availability of data from the American Community Survey (ACS) and other sources. Real estate GOS is divided into "other real estate" and housing services. Other real estate is the portion of the real estate industry engaged in renting or leasing real estate to others; managing real estate for others; selling, buying, or renting real estate for others; and providing other real estate-related services, such as appraisal services. Output from the housing services industry is the imputed rental value of owner-occupied permanent site homes, owner-occupied manufactured homes, and tenant-occupied homes.

5.43. The estimation of state GOS for the real estate industry differs from most industries because total state GOS is estimated and then split into corporate capital charges and proprietors' income. This slightly different approach of estimating proprietors' income is necessary because the state estimates of proprietors' income from the SPI accounts are based on IRS tax records, which record income by place of residence. Since GDP by state is measured by place of work, the real estate proprietors' income must be adjusted to account for this measurement difference. This location adjustment to proprietors' income is not necessary for most industries.[29]

Housing services

5.44. The estimation of GOS for the housing services industry requires several steps:

1. The national GOS for real estate is split into three parts—housing services, farm housing, and other real estate—on the basis of corporate capital charge data for each part, available from the national GDP by Industry Accounts.
2. The national total GOS for the housing services portion of the real estate industry is split into three parts by type of housing—owner-occupied housing for permanent site, manufactured/mobile homes, and tenant-occupied housing—on the basis of data obtained from the NIPAs on net interest, CFC, and rental income of persons for each of these three housing types.
3. The national GOS for owner-occupied permanent site and manufactured homes is distributed to the states using estimates of state imputed rents from the SPI accounts for these two housing types.

29. Many proprietors in the mining and real estate industries are more accurately characterized as investors than owners, and they often do not live in the same state as the establishment they own. Consequently, this adjustment tends to be large for these industries.

4. The national GOS for tenant-occupied housing is distributed to the states using internal state estimates developed from ACS data on tenant-occupied units.
5. The national GOS for farm housing is distributed to the states using internal state estimates developed from ACS data on farm tenant and imputed rent.
6. The GOS estimates for the four housing types are summed to yield an indicator series for housing services.
7. The state indicator series for housing services is used to distribute the national total for housing services GOS to the states on the basis of each state's share of the indicator series total.
8. GOS is split into corporate capital charges and proprietors' income using the ratio of national proprietors' income to GOS.
9. The rental income from farm housing is added to the estimate of proprietors' income computed in step 6.

Other real estate

5.45. The national totals for corporate capital charges and proprietors' income for other real estate are distributed to the states on the basis of Census Bureau receipts data for this piece of the real estate industry. Census Bureau receipts data are available only for economic census years. For noneconomic census years, the corporate capital charges and proprietors' income estimates are computed by extrapolating or interpolating economic census years' values using the annual percent change in SPI wages and salaries.

Federal, State, and Local Government

5.46. In the regional accounts, the government sector consists of federal civilian government, federal military, and state and local government. For federal civilian government and state and local government, GOS consists of the surplus or deficit of government enterprises, the CFC for government enterprises, and the CFC for general government. For federal military, GOS consists of CFC only.

Federal government

5.47. The national measure of federal military CFC is distributed to the states using each state's share of active military personnel. However, the national measure of federal military CFC is adjusted to include only domestic structures and equipment.[30]

30. All military equipment and structures located overseas and mobile military equipment located domestically are excluded from the CFC in the GDP by state statistics but included in the national measure. The CFC, excluding the part that is attributable to mobile equipment, is adjusted to exclude overseas equipment and structures based on the ratio of domestic troop strength to total troop strength.

5.48. The national measure of federal civilian CFC (general government and government enterprises) is distributed to the states using each state's share of federal civilian employment. The remaining component for federal civilian GOS is the surplus or deficit of government enterprises.

5.49. The 12 federal government enterprises for which surplus or deficit is estimated can be classified into 4 categories:

1. the U.S. Postal Service (USPS),
2. federal power authorities,
3. federal insurance programs, and
4. other federal enterprises.[31]

5.50. The methodologies for allocating the national measure of surplus or deficit, by government enterprise and state, are discussed below in terms of these four categories.

5.51. Because GDP by state for the USPS includes neither proprietors' income nor TOPI, GOS for each state can be estimated as the difference between USPS value added and USPS employee compensation. National USPS value added is distributed to the states using each state's share of USPS revenues. National USPS employee compensation is distributed to the states using each state's share of USPS wages and salaries.[32] The difference between these two estimates, value added and employee compensation, for each state is then the estimate of USPS GOS for each state.

5.52. State estimates of GOS for each of the federal power authorities are derived by distributing each power authority's total surplus or deficit to the states on the basis of each state's share of the power authority's generating capacity.[33]

5.53. State estimates of the surplus or deficit for the two federal insurance programs—flood insurance and crop insurance—are derived by distributing each insurance program's total surplus or deficit to the states on the basis of each state's share of the insurance program's premiums received plus indemnities paid.

31. The 12 federal enterprises are the USPS, military post exchanges and restaurants, Bonneville Power Administration, Southeastern Power Administration, Southwestern Power Administration, Upper Colorado River Basin Fund, Tennessee Valley Authority, Federal Housing Administration Fund, Veterans Canteen Service, Federal Crop Insurance Corporation, National Flood Insurance Program, and Centrus Energy Corporation (formerly the U.S. Enrichment Corporation).

32. Wages and salaries for the USPS are available from the SPI series. Employee compensation is wages and salaries plus supplements. USPS supplements, nationally, are estimated by multiplying BEA's measure of supplements for all enterprises by the ratio of USPS wages and salaries to the wages and salaries for all enterprises.

33. Information on the state distribution of generating capacity is obtained from each power authority.

5.54. For the remaining federal government enterprises in the "all other" category:

- The surplus or deficit of the Federal Housing Administration Fund is distributed to the states based on the insured mortgage activity by state.
- The surplus or deficit of military post exchanges and restaurants is distributed to the states based on the number of military personnel (active, retired, and reserve) by state.
- The surplus or deficit of the Veterans Canteen Service is distributed to the states based on canteen sales by state.
- The surplus or deficit of Centrus Energy Corporation (formerly the U.S. Enrichment Corporation) is distributed to the states based on the value of uranium sales by state.

State and local government

5.55. The GOS estimates consist of the surplus or deficit of 16 state and local government enterprises, the CFC for these enterprises, and state and local general government CFC.[34]

5.56. In general, state and local government revenues less expenditures, for each enterprise and state, from the Census Bureau's state and local government finances data are used to distribute to the states the national surplus or deficit of each state and local government enterprise. Exceptions are the Alaska Marine Highway System, which is assigned to Alaska, and miscellaneous commercial activities, which are distributed to the states based on each state's share of population.

5.57. The CFC for state and local government (general government and government enterprises) is distributed to the states based on each state's share of state and local government employment.

5.58. Finally, the components estimated above for state and local government—the surplus or deficit of state and local government enterprises and the CFC for state and local government (general government and government enterprises)—are summed yielding the GOS for state and local government.

Fixed Investment for Intellectual Property Products

5.59. The GOS component of GDP by state, like the national GDP by Industry Accounts counterpart, includes spending by businesses, governments, and nonprofits on research and development (R&D) and entertainment, literary, and artistic originals (EAO). These intangible fixed assets are used repeatedly, or continuously, in the processes of production for at least a year. Business R&D expenditures are classified as either purchased or own account with own account being funded by the producing agent (appendix F).

34. The state and local government enterprise functions are housing and urban renewal, water supply, sewerage, natural gas, electricity supply, toll highways, off-track betting, Alaska Marine Highway System, water terminals, air terminals, transit, liquor stores, lotteries, miscellaneous commercial activities, parking facilities, and miscellaneous insurance trusts.

Research and development

5.60. The business component of R&D for own account is derived using data from the Business R&D and Innovation Survey from the National Science Foundation (NSF). Industry adjustments are made to align the industries from the NSF to the industries used by BEA. Industry estimates are interpolated for industries that exist at the BEA level but not at the NSF level or for data that is not available from the NSF at the state level for a particular industry or year at the time of estimation. Industry estimates are extrapolated for data that is not yet available from the NSF for the years of estimation. The business component of R&D for purchased is estimated using industry value added (GDP) as an indicator series, under the assumption that each industry requires a percentage of its value added (GDP) to be in the form of R&D. The purchased component and the own-account component are added to form the business fixed investment component for R&D.

5.61. The federal government component of R&D is also derived from NSF data, specifically national patterns and federal obligations by agency data. The federal obligations data by agency are used to distribute federal totals in the national patterns data into R&D investment by agencies, which are then converted to BEA industries. The investment by agency data combined with depreciation rates by agency are used to create estimates of stocks and CFC. The CFCs are added to the GOS. The stocks are used to compute CFCs but are not added because, as government expenditures, these are already included.

5.62. Estimates of CFCs for state and local government components are derived from the NSF's Higher Education Research and Development (HERD) Survey and state government R&D surveys. For the public universities subcomponent, HERD data sets are used to generate CFCs. For other state government agencies, state R&D surveys are used. For the years that data is unavailable, HERD is used to extrapolate or interpolate the state R&D expenditures. The nonprofit institutions component of R&D is estimated with data from HERD, national patterns, and the Census Bureau's economic censuses. The HERD data set is used to estimate R&D CFCs for private universities and colleges, and national patterns combined with the economic censuses are used to estimate CFC for other nonprofit components. These industries include hospitals, research and development labs, and other services except government. The business and nonbusiness estimates are summed to form the R&D component of fixed investment.

Entertainment, literary, and artistic originals

5.63. Asset types are assigned to specific industries and include: theatrical movies, long-lived television programs, books, music, photographs, greeting cards, and live theater. The industries they are assigned to include: motion picture and sound recording; broadcasting and telecommunications; performing arts, spectator sports, museums, and related services; publishing industries; and other professional, scientific, and technical Services. The source data for producing the EAO investment estimates are the economic censuses for benchmark years and the Quarterly Census of Employment and Wages to extrapolate and interpolate the nonbenchmark years' estimates. The indicator series derived with these datasets are used to distribute the national annual investment and income totals to states. The last step involves adding the fixed investment estimates for R&D and EAO to each state and industry GOS.

Part VI. Real GDP by State

Chain-Type Quantity Indexes

6.1. BEA prepares chain-type quantity indexes, by industry, for the nation. State-level information on prices by industry is not available, so estimates of real GDP by state are derived by applying national-level industry chain-type price indexes to the current-dollar GDP by state estimates for the detailed industries. Real GDP by state for the aggregate industries (such as all-industry total, services, manufacturing, and so on) is derived by using the same chain-type index formula that is used in the national accounts. To the extent that a state's output is produced and sold in national markets at relatively uniform prices (or sold locally at national prices), real GDP by state captures the relative differences in the mix of goods and services that states produce. However, real GDP by state does not capture state-to-state differences in the prices of goods and services that are produced and sold locally.

6.2. Unlike fixed-weighted measures, chain-weighted measures are not based on the price weights of a single base year, but on the prices and quantities of adjacent years. Fixed-weighted measures have a number of disadvantages, including the need for periodic rebasing, leading to significant revisions to historical data, and the inability to capture substitution effects caused by changing relative prices of goods and services. Chain-weighted measures avoid these weaknesses.

6.3. However, chain-weighted measures do have some disadvantages. They are not additive, because they are based upon geometric means, and they are more difficult to compute than fixed-weighted measures. The non-additivity of chain-weighted measures means that total real GDP by state cannot be obtained by summing the real GDP by state of each industry. As a result, the contribution of each industry to a change in real total GDP by state is not readily computable. The computation of contributions to growth is described later in this section.

6.4. To calculate a chain-type quantity index for total GDP by state, or GDP by state of any aggregate industry, a Fisher Ideal index is used. The Fisher Ideal index is the geometric mean of the Laspeyres and Paasche quantity indexes.

6.5. The Paasche quantity index is defined as:

$$P_{1,2} = \frac{\sum_i (p_{i,2} \times q_{i,2})}{\sum_i (p_{i,2} \times q_{i,1})},$$

and the Laspeyres quantity index is defined as:

$$L_{1,2} = \frac{\sum_i (p_{i,1} \times q_{i,2})}{\sum_i (p_{i,1} \times q_{i,1})}.$$

6.6. The Fisher quantity index is the geometric mean of the Paasche and Laspeyres quantity indexes for adjacent years:

$$F_{1,2} = \sqrt{L_{i,2} \times \mathrm{P}_{1,2}} = \sqrt{\frac{\sum_i (p_{i,1} \times q_{i,2})}{\sum_i (p_{i,1} \times q_{i,1})} \times \frac{\sum_i (p_{i,2} \times q_{i,2})}{\sum_i (p_{i,2} \times q_{i,1})}}.$$

6.7. However, in the above formula, the variables that represent the composites of prices in one year and quantities in an adjacent year (for example, $p_{i,1} \times q_{i,2}$) are not directly observable, so an algebraically equivalent formula is used to calculate the Fisher quantity index:

$$F_{1,2} = \sqrt{\frac{\sum_i \frac{p_{i,1}}{p_{i,2}} (p_{i,2} \times q_{i,2})}{\sum_i (p_{i,1} \times q_{i,1})} \times \frac{\sum_i (p_{i,2} \times q_{i,2})}{\sum_i \frac{p_{i,2}}{p_{i,1}} (p_{i,1} \times q_{i,1})}}.$$

6.8. The Fisher quantity index measures the percent change in real quantities between adjacent years. To obtain a time series, successive indexes are calculated and then chained together by arbitrarily setting the first year equal to 1.0 and iteratively multiplying the current year's index by the next year's index. To change the reference year (there is no "base year," in the sense that there is in the case of fixed-weighted indexes) of the series, one must only divide each element of the series by the value of the index for the desired reference year. Real chained-dollar GDP by state estimates are calculated from the chained Fisher Ideal index series by multiplying the index for each year by the current-dollar GDP by state value for the reference year. For display purposes, the indexes are commonly multiplied by 100, to set the reference year value to 100.0 rather than 1.0. GDP by state value for the reference year. For dis- play purposes, the indexes are commonly multiplied by 100, to set the reference year value to 100.0 rather than 1.0.

Contributions to real growth

6.9. Real chain-weighted GDP by state is not additive (except for the trivial case of the reference year, when the real and nominal dollar values are the same), because the underlying quantity indexes are geometric means of indexes from adjacent years.

6.10. As a result, the contribution of each individual industry or region to a change in total GDP by state cannot be calculated simply by dividing the change in a component (an industry or a region) by the change in the total. Instead, a more complicated approach is required to account for the non-additivity of the real GDP by state measures.

6.11. The formula below is used to calculate the contribution of component i to the percent change in total real GDP by state:

$$C\%\Delta_{i,t} = 100 \times \frac{((p_{i,t}/P_t^F) + p_{i,t-1}) \times (q_{i,t} - q_{i,t-1})}{\sum_j ((p_{j,t}/P_t^F) + p_{j,t-1}) \times q_{j,t-1}} \quad ,$$

where:

P_t^F is the Fisher price index for the aggregate in period t relative to period t–1,

$P_{i,t}$ is the price of component i in period t, and

$q_{i,t}$ is the quantity of component i in period t.

Part VII. Quarterly Gross Domestic Product by State

Overview

7.1. This section presents the methodology used by BEA to produce its quarterly GDP by state estimates. These statistics provide more timely information on state-level economic growth than the more traditional annual GDP by state estimates and can be used in conjunction with other economic estimates produced by BEA.[35]

7.2. The methodology used to produce the quarterly GDP by state estimates relies heavily on annual GDP by state, national GDP by Industry Accounts quarterly GDP by industry, and quarterly state personal income. Quarterly earnings by industry at the state level are initially used to interpolate or extrapolate quarterly GDP values. These initial quarterly GDP by state estimates are then scaled to national GDP by Industry Accounts quarterly GDP by industry and the annual GDP by state statistics.

Methodology

7.3. The calculation of quarterly GDP by state estimates starts by creating current-dollar estimates for each industry in each state. Price information from BEA's national GDP by Industry Accounts are then used to adjust these estimates for price differences when making comparisons of quarterly GDP by state across time and to calculate industry contributions to growth within a state. The methodology to create the quarterly GDP by state estimates depends on the availability of annual GDP by state estimates. Estimates for quarters when annual estimates exist are based on interpolation, whereas estimates for quarters when annual estimates do not exist are based on extrapolation.

35. For more on the history and development of the quarterly GDP by state statistics, see Lam Cao, Charles Ian Mead, Todd Siebeneck, and Catherine (Zheng) Wang, "Prototype Quarterly Gross Domestic Product by State Statistics for 2005–2013," *Survey* 94 (October 2014).

Interpolated quarters

7.4. The process to calculate these estimates for interpolated quarters begins by calculating current-dollar GDP by industry for each state. After these estimates are calculated, real GDP by state and contributions to growth are calculated.

Current-dollar statistics

7.5. The quarterly GDP by state estimates are calculated using an iterative process of interpolating the annual GDP by state estimates and scaling the results to the national GDP by Industry Accounts quarterly GDP by industry estimates. Specifically, the estimates for each industry are calculated in five steps:

1. Interpolate annual GDP by state and industry using quarterly earnings by state and industry as the pattern series. The earnings estimates used are from BEA's quarterly state personal income statistics.
2. Scale the estimates to the national GDP by Industry Accounts quarterly GDP by industry value added (GDP) estimates.
3. Interpolate annual GDP by state and industry using the estimates from step 2 above as the pattern series in place of earnings.
4. Scale the estimates to the national GDP by Industry Accounts quarterly GDP by industry estimates.
5. Steps 3 and 4 are repeated until both the four quarters of GDP by state average to the annual GDP by state statistics and the quarterly sum-of-states statistic for each industry converge to the national GDP by Industry Accounts quarterly GDP by industry statistic.

7.6. ***Interpolation.*** For most industries, quarterly GDP by state estimates are created by using quarterly earnings by state and industry as the pattern series.[36] The proportional Denton method is used to interpolate quarterly estimates from annual estimates.

7.7. ***Scaling.*** The initial interpolated estimates of quarterly GDP by state are scaled to equal national GDP by Industry Accounts totals of quarterly GDP by industry. If the national total for an industry differs from the initial sum-of-states total for an industry, the difference between the national total and the sum-of-states total is allocated to the states according to the states distribution of the initial estimates. This is done for all industries published in the quarterly GDP by state statistics.

36. Quarterly earnings by state and industry are used for the pattern series in all but three industries: mining; real estate, rental, and leasing; and management of companies and enterprises. For these industries, quarterly wages and salaries by state are used.

7.8. GDP by state excludes federal civilian and military activity located overseas that is included in the national GDP by Industry Accounts. To account for this difference, federal civilian and military estimates are computed from the national GDP by Industry Accounts estimates, and the state estimates are scaled to these.

7.9. The final scaling of quarterly GDP by state is to the annual GDP by state estimates and not the national GDP by Industry Accounts quarterly GDP by industry estimates; therefore, the quarterly GDP sum-of-state estimates may differ slightly from the national GDP by Industry Accounts quarterly GDP by industry estimates.

Extrapolated quarters

7.10. To extend the quarterly GDP by state estimates to quarters where an annual GDP by state value does not yet exist, extrapolation is used. Once the current- and real-dollar statistics are calculated, the same contribution to growth formula is applied.

Current-dollar statistics

7.11. The current-dollar estimates for each of the industries are extended to additional quarters by applying the quarterly percent change in the indicator series to the current-dollar value of the previous quarter.

7.12. The indicator series is the same series that is used as the pattern series for interpolating annual current-dollar GDP estimates.

7.13. The extrapolated estimates of quarterly GDP by state are then scaled to the national GDP by Industry Accounts quarterly GDP by industry estimates.

Real-dollar statistics

7.14. The real-dollar estimates are first calculated for the detailed industries. Real-dollar estimates are then calculated for the four aggregate industries—all industries, private industries, manufacturing, and government.

7.15. ***Detailed industries.*** Estimates of real GDP by industry for each state are created by directly deflating the current-dollar estimates for the most detailed industries using national chain-type price indexes. This method directly correlates to the deflation process used for the most detailed industries at the annual level.

7.16. ***Aggregate industry sectors.*** For the four aggregate industry sectors (all industries, private industries, manufacturing, and government), real GDP by state is calculated using the same chain-type index formula used in the national accounts (described in "Part VI. Real GDP by State").

Part VIII. Technical Notes

Allocation Procedures

8.1. Allocation procedures impart to state estimates the characteristics of national estimates that are not reflected in the available state-level source data; for most components of GDP, state source data are less comprehensive and less reliable than the data that are available for national estimates. In addition, these procedures allow the use of state data that are related to, but that do not precisely match, the component being estimated. For example, national control totals are allocated to states in proportion to unpublished wages and salaries when data directly related to the component is not available.

8.2. In the allocation procedures, the national control total for a component is allocated to states in proportion to each state's share of related data (also known as an indicator series). In many cases, the indicator series is modified or augmented before the allocation by preliminary estimation—for example, by the summation/subtraction of data sources or by interpolation or extrapolation.

8.3. Because the allocation procedures use the national control totals for state estimates, their use yields an additive system in which state estimates sum to the national estimate.

8.4. The allocation procedure used to estimate a component of GDP by state is:

$$\hat{x}_i = X_{US} * \left[z_i \Big/ \sum_{j=1}^{51} z_j \right],$$

8.5. where X_i is the state i estimate for some component of GDP by state, X_{US} = the predetermined national total being distributed to the states, and z_i is the state i value of indicator series Z, being used to allocate the value of X_{US} to the states.

8.6. In practice, it is often advisable to perform data allocations using the absolute values of the indicator series, so the above formulation would become:

$$\hat{x}_i = X_{US} * \left[\left| z_i \right| \Big/ \sum_{j=1}^{51} \left| z_j \right| \right].$$

8.7. Basing the allocation on absolute values has advantages when either the indicator series or the national total being distributed may contain negative numbers, as commonly occurs when the data are net values, such as net interest.

Dual Allocation

8.8. Dual allocation is a statistical procedure that forces the elements of a matrix to sum to column and row control totals. It is used to adjust, for instance, a preliminary estimate of a GDP component by state and industry so the sum of the component in an industry across all states equals a national control total for that industry, and simultaneously, the sum of the component in a state across all industries equals a control total for that state. It is also used to adjust a preliminary estimate of quarterly GDP by state so it is consistent with both national control totals by quarter and annual state control totals.

8.9. Specifically, dual allocation subtracts the sum of the algebraic values in a row from the row control total. It divides this difference by the sum of the absolute values in the row, and then multiplies the resulting ratio by the absolute value of each element in the row, and adds the result to the algebraic value of that element. This procedure is repeated for each row, and then a parallel procedure is repeated for each column. The whole process is repeated multiple times.

Disclosure-Avoidance Procedures

8.10. Like other statistical agencies, BEA is legally required to safeguard the confidentiality of the information it receives. In addition, like other agencies, it must balance its responsibility to avoid disclosing confidential information with its responsibility to release as much information as possible. It balances these responsibilities by presenting the estimates for regions and states at the North American Industry Classification System (NAICS) subsector level, even though it may receive source data at the NAICS four- and five-digit industry levels.

8.11. Most of the data that BEA receives from other agencies are not confidential. The agencies summarize their data by program and state so each record, or data cell, contains data for enough individuals or establishments to preclude the identification of data for a specific individual or establishment and, therefore, to preclude disclosure of confidential information.

8.12. However, the Quarterly Census of Employment and Wages (QCEW) tabulations BEA receives from the U.S. Bureau of Labor Statistics (BLS) include records that would disclose confidential information. The confidential information on wages and salaries for some business firms is identifiable from the state and county estimates of wages and salaries that are derived from the QCEW data.

8.13. To prevent either the direct or indirect disclosure of confidential information, BEA uses the BLS state nondisclosure file. BEA uses as many BLS nondisclosure cells as possible but cannot use some of them for various reasons. The most important reasons are that the industry structure published by BEA does not exactly match the NAICS subsector detail provided by BLS and that BEA does not use QCEW data for the farm sector. When BEA drops BLS nondisclosure cells, other cells must be selected to prevent the disclosure of confidential information. To determine which estimates should be suppressed, the total wages and salaries file and the wages and salaries nondisclosure file are used to prepare a multidimensional matrix. This matrix is tested, and the estimates that should be suppressed are selected.[37]

Imputation

8.14. One of the principles of the National Income and Product Accounts (NIPAs) is they reflect market transactions. In a few instances, a comprehensive account of total income and production requires BEA to impute a value. This keeps the NIPA invariant to how certain activities are carried out. For instance, for some transactions, such as the rental of housing to an owner-occupant, no transaction appears in the records of the economy. In this case, imputation involves constructing a transaction between a producer and a consumer (who happen to be the same person) and placing a market value on the housing services exchanged. If the imputation were not made, then housing output and consumption would fall if an owner-occupant purchased the house it had been renting.

8.15. The imputation that is treated explicitly in GDP by state is:

8.16. The imputed net rental income of owner-occupied housing is included in the rental income of persons, a component in gross operating surplus.

Interpolation and Extrapolation

8.17. Interpolation and extrapolation are used to prepare the first approximations of some components of GDP by state for the years in which direct source data are unavailable. Both procedures use the data for these components for benchmark (economic census) years—the years for which the best data are available—and both frequently use other data that are related to the benchmark-year data for the components.

37. In this test, computer programs impose a set of rules and priorities on this matrix so the estimates that should be suppressed are selected until indirect disclosure is impossible.

8.18. Interpolation is used to derive the first approximation of estimates for years that are between benchmark years. All interpolations used in estimating GDP by state are growth rate interpolations. That is, they are geometric rather than liner interpolations.

8.19. Consider a case in which data are available only at 5-year intervals:

$$X = \{x_0, x_5, x_{10}, \ldots, x_{25}\}.$$

8.20. Values for intermediate years need to be estimated by interpolation.

8.21. Whenever possible, a time series of related data is used to compute the interpolated values in the time series *X*, above. If the data being interpolated were, for example, payroll or value-added data by industry and state, then a related series to be used might be unpublished BEA wages and salaries by industry and state:

$$W = \{w_0, w_1, w_2, w_3, w_4, \ldots, w_{25}\}.$$

8.22. The wages and salaries data, *W*, are available for all years in the time series, so the interpolated values for *X* can be tied to the available values of *W* by interpolating the ratio between the two series. For the years for which values of *X* are available, compute the ratios between the values of *X* and the values of the related series *W*:

where $r_t = {}^{w_t}\!/_{x_t}$.

8.23. The interpolated values of these ratios are then computed by applying the average annual growth rate between available ratio values, which are directly computable just every 5 years in the current example:

$$\Delta_{t,\,t+5} = \sqrt[5]{r_{t+5}/r_t} \ .$$

8.24. The value is the annual geometric factor (technically, it is 1.0 plus the average annual growth rate in the ratio) for computing interpolated values of the ratios between the related data series *W* and the missing values *X*:

$$r_1 = \Delta_{0,5} \times r_0 \Rightarrow x_1 = w_1/(\Delta_{0,5} \times r_0),$$
$$r_2 = \Delta_{0,5} \times r_1 \Rightarrow x_2 = \frac{w_2}{\Delta_{0,5} \times r_1} \Rightarrow x_2 = \frac{w_2}{\Delta^2_{0,5} \times r_0},$$

8.25. One limitation of the geometric interpolation method outlined here is it is useless if the endpoint values being interpolated are of opposite sign. There is no constant annual growth rate, and therefore no value of Δ, that will carry one monotonically from a negative number to a positive one, or vice versa. (A negative value of Δ may be found to traverse the interpolation period and connect the available endpoints; however, it would do so by oscillating annually between negative and positive values—not generally a desirable result.) In these cases, a linear interpolation of the ratios between X and W may be the only solution, but one needs to carefully review the results of any such interpolation, since the construction of the ratio—which value is the numerator and which is the denominator—will affect the shape of the resulting interpolated time series, sometimes in surprising fashion.

8.26. Extrapolation is used to derive first approximations for years that are beyond the most recent benchmark year.

8.27. A similar approach to the one above can be used to extrapolate values of X. In this case, one would need to decide what value to assign to Δ. Assigning Δ a value of 1.0 keeps the ratio between X and W constant during the extrapolation period (Δ is 1.0 plus the annual growth rate, so a value of 1.0 implies a zero growth rate for the ratio). However, it may be possible, through regression analysis or other means, to identify a time trend in the relationship between X and W. The value may then be nonzero, but the algebra of the extrapolation would be the same.

NAICS Compensation of Employees by Industry, 1998–2000

8.28. BEA developed state estimates of compensation of employees by industry from 1998 to 2000 on a NAICS basis using the reconstructed NAICS-based data prepared by BLS, County Business Patterns (CBP) data from the Census Bureau, and BEA's earnings and employment estimates published on a SIC basis. For a detailed discussion on this process, see "NAICS Earnings and Employment by Industry, 1998–2000" in the "Technical Notes" section of *State Personal Income and Employment: Concepts and Methods*.

Adjustments to Financial Items of Utilities Companies

8.29. BEA adjusts the profits and depreciation plus amortization reported to the Federal Energy Regulatory Commission by utilities companies to make them consistent with the conventions used in the NIPAs. The three steps below describe the adjustments to operating expenses, operating income, and net interest:

1. The adjustment to operating expenses of each company consists of the net provision for deferred income taxes divided by the corporate statutory tax rate:

$$\Delta = \frac{(P - C)'}{r},$$

where Δ is the adjustment made to company operating expenses, P is provision for deferred income taxes, C is provision for deferred income taxes (credits), and r is statutory corporate income tax rate.

The adjusted operating expenses value is combined with reported depreciation expense plus amortization to yield the indicator series used to distribute to the states the national corporate capital consumption allowance for utilities companies.

2. The same adjustment is made to reported net utility operating income. Then the following financial items are added to the adjusted value of operating income:

   - reported federal income taxes on operating and other income,
   - reported net investment tax credit adjustments,
   - reported total other income less other income deductions, and
   - reported loss on disposition of property.

This adjusted net utility operating income is then used to distribute to the states the national industry total of corporate profits with inventory valuation adjustment minus taxes other than income taxes (because those are accounted for in taxes on production and imports) minus the sum of allowance for borrowed funds used during construction plus net interest charges.

3. The sum of net interest charges and allowance for borrowed funds used during construction is used as the indicator series to distribute to the states the national utilities industry net interest total.

Part IX. Appendixes

Appendix A

Appendix A. The Relation of Sum-of-State GDP and GDP From the IEA, 2022

[Billions of dollars]

Component	IEA GDP	Sum-of-state GDP	Difference[1]
GDP	26,006.9	25,859.1	147.8
Compensation of employees	13,454.1	13,416.2	37.9
Taxes on production and imports less subsidies	1,722.2	1,722.2	0.0
Gross operating surplus	10,830.5	10,720.7	109.8

GDP Gross domestic product

IEA Industy Economic Accounts

1. The difference is due to overseas activity—economic activity taking place outside the borders of the United States by the military and associated federal civilian support staff.

Note. Data are from the September 2024 annual revision.

U.S. Bureau of Economic Analysis

Appendix B

Appendix B. NAICS Industries for Which GDP by State Estimates Are Available

	2017 NAICS code
Private industries	
Agriculture, forestry, fishing, and hunting	**11**
Farms	111–112
Forestry, fishing, and related activities	113–115
Mining, quarrying, and oil and gas extraction	**21**
Oil and gas extraction	211
Mining (except oil and gas)	212
Support activities for mining	213
Utilities	**22**
Construction	**23**
Manufacturing	**31–33**
Durable-goods manufacturing	321, 327–339
Wood product manufacturing	321
Nonmetallic mineral product manufacturing	327
Primary metal manufacturing	331
Fabricated metal product manufacturing	332
Machinery manufacturing	333
Computer and electronic product manufacturing	334
Electrical equipment, appliance, and component manufacturing	335
Motor vehicles, bodies and trailers, and parts manufacturing	3361–3363
Other transportation equipment manufacturing	3364–3366, 3369
Furniture and related product manufacturing	337
Miscellaneous manufacturing	339
Nondurable-goods manufacturing	311–316, 322–326
Food and beverage and tobacco product manufacturing	311–312
Textile mills and textile product mills	313–314
Apparel, leather, and allied product manufacturing	315–316

Table continues on next page

	2017 NAICS code
Paper manufacturing	322
Printing and related support activities	323
Petroleum and coal products manufacturing	324
Chemical manufacturing	325
Plastics and rubber products manufacturing	326
Wholesale trade	**42**
Retail trade	**44–45**
Transportation and warehousing	**48–49**
Air transportation	481
Rail transportation	482
Water transportation	483
Truck transportation	484
Transit and ground passenger transportation	485
Pipeline transportation	486
Other transportation and support activities	487–488, 492
Warehousing and storage	493
Information	**51**
Publishing industries (except internet)	511
Motion picture and sound recording industries	512
Broadcasting (except internet) and telecommunications	515, 517
Data processing, hosting, and other information services	518–519
Finance, insurance, real estate, rental, and leasing	**52–53**
Finance and insurance	52
Monetary authorities—central bank, credit intermediation, and related services	521–522
Securities, commodity contracts, and other financial investments and related activities	523
Insurance carriers and related activities	524
Funds, trusts, and other financial vehicles	525
Real estate and rental and leasing	53
Real estate	531
Rental and leasing services and lessors of nonfinancial intangible assets	532–533
Professional and business services	**54–56**

Table continues on next page

	2017 NAICS code
Professional, scientific, and technical services	54
Legal services	5411
Computer systems design and related services	5415
Miscellaneous professional, scientific, and technical services	5412–5414, 5416–5419
Management of companies and enterprises	55
Administrative and support and waste management and remediation services	56
Administrative and support services	561
Waste management and remediation services	562
Educational services, health care, and social assistance	**61–62**
Educational services	61
Health care and social assistance	62
Ambulatory health care services	621
Hospitals	622
Nursing and residential care facilities	623
Social assistance	624
Arts, entertainment, recreation, accommodation, and food services	**71–72**
Arts, entertainment, and recreation	71
Performing arts, spectator sports, museums, and related activities	711–712
Amusement, gambling, and recreation industries	713
Accommodation and food services	72
Accommodation	721
Food services and drinking places	722
Other services (except government and government enterprises)	**81**
Government and government enterprises	**92**
Federal civilian	...
Military	...
State and local	...

... No corresponding NAICS code
GDP Gross domestic product
NAICS North American Industry Classification System

Sources: Executive Office of the President, Office of Management and Budget, *North American Industry Classification System Manual 2017* (Washington, DC: U.S. Government Publishing Office, 2017) and the U.S. Bureau of Economic Analysis.

Appendix C

Appendix C. Major Sources of State Data for the Estimates of Taxes on Production and Imports by Industry

Product/activity taxed	Major source of data	Industry affected
Federal excise taxes:		
Imported products	Collections of customs duties by port from DOT	Wholesale trade and food and beverage and tobacco product manufacturing
Coal mining	Production of coal from DOE	Mining (except oil and gas)
Alcoholic beverages	Wage and salary disbursements for employees covered by unemployment insurance from BLS	Food and beverage and tobacco product manufacturing
Tobacco	Wage and salary disbursements for employees covered by unemployment insurance from BLS	Food and beverage and tobacco product manufacturing
Transportation of persons and property by air	Passenger and freight enplanements by air from DOT	Air transportation
Chemicals and vaccines	Wage and salary disbursements for employees covered by unemployment insurance from BLS	Chemical manufacturing
Firearms transfer	Personal income from BEA	Retail trade
Sport fishing equipment, bows, and arrows	Wage and salary disbursements for employees covered by unemployment insurance from BLS	Miscellaneous manufacturing
Telephone and teletypewriter services	Wage and salary disbursements for employees covered by unemployment insurance from BLS	Broadcasting (except internet) and telecommunications
Electric detection/sonar devices	Wage and salary disbursements for employees covered by unemployment insurance from BLS	Computer and electronic product manufacturing
Petroleum	Refinery inputs of crude oil	Petroleum and coal products manufacturing
Tires	Wage and salary disbursements for employees covered by unemployment insurance from BLS	Plastics and rubber products manufacturing
Nuclear waste disposal	Generation of nuclear power from DOE	Utilities
Heavy-duty trucks	Payments into highway trust fund attributable to highway users from DOT	Wholesale trade

Table continues on next page

Product/activity taxed	Major source of data	Industry affected
Highway use by heavy vehicles	Payments into highway trust fund attributable to highway users from DOT	Truck transportation, wholesale trade, and retail trade
Alcohol license	Personal income from BEA	Retail trade
Diesel and special motor fuels	Payments into highway trust fund attributable to highway users from DOT	Wholesale trade
Luxury retail	Personal income from BEA	Retail trade
Chemical and vaccines	Wage and salary disbursements for employees covered by unemployment insurance from BLS	Chemical manufacturing
Aviation fuel (commercial and noncommercial) and gasoline used in noncommercial aviation	Consumption of aviation gas fuel and nongas fuel from DOE	Wholesale trade
Firearms and ammunition	Wage and salary disbursements for employees covered by unemployment insurance from BLS	Fabricated metal product manufacturing
Electric outboard motors and devices	Wage and salary disbursements for employees covered by unemployment insurance from BLS	Machinery manufacturing
Fuel used commercially on inland waterways	Wage and salary disbursements for employees covered by unemployment insurance from BLS	Water transportation
"Gas guzzlers"	Wage and salary disbursements for employees covered by unemployment insurance from BLS	Wholesale trade
Policies issued by foreign insurers	Unpublished estimates of wages and salaries from BEA	Insurance carriers and related activities
Wagering	Wage and salary disbursements for employees covered by unemployment insurance from BLS	Amusement, gambling, and recreation industries
State and local taxes:		
Amusement license and sales tax	Compensation of employees from BEA	Amusement, gambling, and recreation industries and motion picture and sound recording industries
Building permits	Building permits from U.S. Census Bureau	Construction
Documentary and stock transfer	Census Bureau tabulations by state and industry	Securities, commodity contracts, and other financial investments and related activities; real estate; and legal services
Franchise	Compensation of employees from BEA	All industries except farms, social assistance, and government

Table continues on next page

Product/activity taxed	Major source of data	Industry affected
General sales tax	Sales tax receipts by industry	All industries except farms and federal government
Hunting and fishing license	Census Bureau tabulations by state	Forestry, fishing, and related activities
Insurance	Census Bureau tabulations by state	Insurance carriers and related activities
Alcohol license	Compensation of employees from BEA	Food and beverage and tobacco product manufacturing; wholesale trade; and retail trade
Alcohol sales	Census Bureau tabulations by state	Food and beverage and tobacco product manufacturing; wholesale trade; and retail trade
Motor fuel sales	Census Bureau tabulations by state	Wholesale trade
Motor vehicle license	BEA tabulations for farms and Census Bureau tabulations for all other industries	All industries except government
Severance	Census Bureau tabulations by state	Forestry, fishing, and related activities; oil and gas extraction; mining (except oil and gas); and utilities
Occupational and business license	Census Bureau tabulations by state	All industries except farms and government
Other taxes on production and imports	Compensation of employees from BEA	All industries except farms and government
Parimutuel	Census Bureau tabulations by state	Amusement, gambling, and recreation industries
Tobacco	Census Bureau tabulations by state	Food and beverage and tobacco product manufacturing
Public utility license	Compensation of employees from BEA	Utilities, transportation and warehousing, and broadcasting (except internet) and telecommunications
Public utility sales	Census Bureau tabulations by state	Utilities, transportation and warehousing, and broadcasting (except internet) and telecommunications
Other selective sales	Census Bureau tabulations by state	All industries except farms and government
Property	Compensation of employees from BEA	All industries except farms and government
Special assessments	Special assessments from Census Bureau	Real estate

BEA U.S. Bureau of Economic Analysis
BLS U.S. Bureau of Labor Statistics
DOE U.S. Department of Energy
DOT U.S. Department of Transportation
U.S. Bureau of Economic Analysis

Appendix D

Appendix D. Major Sources of State Data for the Estimates of GDP by State and Industry

Industry	Benchmark years	Nonbenchmark years
Agriculture, forestry, fishing, and hunting:		
Farms	Farm income and expenses from USDA	Same as benchmark
Forestry, fishing, and related activities	Wage and salaries from BEA	Same as benchmark
Mining	Value added and payrolls from economic census of mining industries	Interpolated or extrapolated using value of production from DOE and USGS
Utilities	Income and expenses by company and generating capacity by operating plant for electric utilities from Federal Energy Regulatory Commission and EIA, respectively; receipts, exports, and deliveries to consumers of natural gas by gas utilities from EIA; wages and salaries for sanitary services from BEA	Same as benchmark
Construction	Value added and payrolls from economic census of construction industries	Interpolated or extrapolated using earnings by place of work from BEA
Manufacturing	Value added and payrolls from economic census of manufacturing industries	Value added and payrolls from Annual Survey of Manufactures
Wholesale trade	Receipts and payrolls from economic census of wholesale trade	Interpolated or extrapolated using wages and salaries from BEA
Retail trade	Receipts and payrolls from economic census of retail trade	Interpolated or extrapolated using wages and salaries from BEA
Transportation and warehousing:		
Air transportation	Income and expenses by company and passenger and enplanements from DOT	Same as benchmark
Rail transportation	For Class I and Class II railroads as a group, revenue ton-miles and revenues and expenses from DOT; revenues, expenses, and passenger boardings from Amtrak	Same as benchmark
Water transportation	Receipts and payrolls from economic census of transportation industries	Interpolated or extrapolated using wages and salaries from BEA
Truck transportation	Receipts and payrolls from economic census of transportation industries	Interpolated or extrapolated using wages and salaries from BEA

Table continues on next page

Industry	Benchmark years	Nonbenchmark years
Transit and ground passenger transportation	Receipts and payrolls from economic census of transportation industries	Interpolated or extrapolated using wages and salaries from BEA
Pipeline transportation	Receipts and payrolls from economic census of transportation industries	Interpolated or extrapolated using wages and salaries from BEA
Other transportation and support activities	Receipts and payrolls from economic census of transportation industries	Interpolated or extrapolated using wages and salaries from BEA
Warehousing and storage	Receipts and payrolls from economic census of warehousing and storage industries	Interpolated or extrapolated using wages and salaries from BEA
Information	Receipts and payrolls from economic census of information industries	Interpolated or extrapolated using wages and salaries from BEA
Finance and insurance:		
Monetary authorities—central bank, credit intermediation, and related services	Income and expenses from FDIC, FRB, Office of Thrift Supervision, and Federal Home Loan Bank Board	Same as benchmark
Securities, commodity contracts, and other financial investments and related activities	Receipts and payrolls from economic census of finance industries	Interpolated or extrapolated using wages and salaries from BEA
Insurance carriers and related activities	Premiums paid and losses incurred by type of insurance and state from the National Association of Insurance Commissioners	Same as benchmark
Funds, trusts, and other financial vehicles	Wages and salaries from BEA	Same as benchmark
Real estate, rental, and leasing:		
Real estate	American Community Survey data on housing and utility expenditures and imputed rent from BEA for housing services and receipts and payrolls from economic census of real estate for other real estate	Same as benchmark for housing services and interpolated or extrapolated using wages and salaries from BEA for other real estate
Rental and leasing services and lessors of intangible assets	Receipts and payrolls from economic census of rental and leasing industries	Interpolated or extrapolated using wages and salaries from BEA
Professional, scientific, and technical services	Receipts and payrolls from economic census of professional, scientific, and technical industries	Interpolated or extrapolated using wages and salaries from BEA
Management of companies and enterprises	Wages and salaries from BEA	Same as benchmark
Administrative and support and waste management and remediation services	Receipts and payrolls from economic census of administrative and support and waste management and remediation services industries	Interpolated or extrapolated using wages and salaries from BEA
Health care and social assistance	Receipts and payrolls from economic census of health care and social assistance industries	Interpolated or extrapolated using wages and salaries from BEA

Table continues on next page

Industry	Benchmark years	Nonbenchmark years
Arts, entertainment, and recreation	Receipts and payrolls from economic census of arts, entertainment, and recreation industries	Interpolated or extrapolated using wages and salaries from BEA
Accommodation and food services	Receipts and payrolls from economic census of accommodation and food services industries	Interpolated or extrapolated using wages and salaries from BEA
Other services, except government	Receipts and payrolls from economic census of other services industries	Interpolated or extrapolated using wages and salaries from BEA
Government:		
Federal civilian	Federal civilian employment from BLS; generating capacity of federal power authorities; postal service revenues from USPS; volume of Federal Housing Administration mortgage insurance from HUD; premiums and indemnities of the Federal Crop Insurance Corporation from USDA; premiums received and amounts paid for losses by National Flood Insurance Program from FEMA; income and expenses of Federal Reserve banks from FRB; uranium sales from USEC; canteen sales from DVA	Same as benchmark
Federal military	Federal military employment from BLS	Same as benchmark
State and local	Revenues and expenses for 15 types of enterprises from U.S. Census Bureau and state and local government employment from BLS	Same as benchmark

BEA U.S. Bureau of Economic Analysis
BLS U.S. Bureau of Labor Statistics
DOE U.S. Department of Education
DOT U.S. Department of Transportation
DVA U.S. Department of Veterans Affairs
EIA Energy Information Administration
FDIC Federal Deposit Insurance Corporation
FEMA Federal Emergency Management Agency
FRB Federal Reserve Board
GDP Gross domestic product
HUD U.S. Department of Housing and Urban Development
USDA U.S. Department of Agriculture
USEC U.S. Enrichment Corporation
USGS U.S. Geological Survey
USPS U.S. Postal Service
U.S. Bureau of Economic Analysis

Appendix E

Appendix E. Major Sources of State Data for the Estimates of Nontax Payments to Government

Product/activity taxed	Major source of data	Industry affected
Grazing fees	Grazing receipts from federal lands from DOI	Farms
Onshore and offshore mining rents and royalties	Federal rents and royalties from DOI	Oil and gas extraction
Miscellaneous rents and royalties	Wages and salaries from BEA	Real estate
Federal Reserve banking (assessments)	Assessments on Federal Reserve banks from FRB	Monetary authorities—central bank, credit intermediation, and related services

BEA U.S. Bureau of Economic Analysis
DOI U.S. Department of the Interior
FRB Federal Reserve Board
U.S. Bureau of Economic Analysis

Appendix F

Appendix F. Major Sources of State Data for the Estimates of Fixed Investment for Intellectual Property Products

Sector and majority activity	Major source of data	Industry
R&D		
Business		
Own account	R&D expenditures from NSF's BERD Survey and National Patterns of R&D Resources	All private industries except farms, legal services, educational services, and hospitals
Purchased	Value added by industry and state from BEA	All private industries except farms, legal services, educational services, and hospitals
Government		
Federal		
Intramural	Federal obligations for R&D from NSF's *FFRD* and *National Patterns of R&D Resources*	Federal military and federal civilian
Extramural	Federal obligations for R&D from NSF's *FFRD* and *National Patterns of R&D Resources*	Federal military and federal civilian
State and local		
Academic institutions	R&D expenditures from NSF's HERD Survey	State and local government
Nonacademic institutions	R&D expenditures from NSF's Survey of State Government Research and Development	State and local government
Nonprofit institutions serving households	HERD Survey from NSF; receipts and payrolls from economic census of affected industries	Legal services; miscellaneous professional, scientific, and technical services; educational services; ambulatory health care services; hospitals; nursing and residential care facilities; social assistance; performing arts, spectator sports, museums, and related activities; amusement, gambling, and recreation services; and "other services," except government

Table continues on next page

Sector and majority activity	Major source of data	Industry
Private universities and colleges	R&D expenditures from NSF's HERD Survey	Educational services
Other nonprofit institutions	Tax-exempt industry receipts from the Economic Census and corresponding industry wages from BLS QCEW	Miscellaneous professional, scientific, and technical services; hospitals; and other services (except government and government enterprises)
Entertainment, literary, and artistic originals	Receipts and payroll from economic census of affected industries in benchmark years and interpolated or extrapolated using QCEW from BLS in nonbenchmark years	Publishing industries (except internet); motion picture and sound recording industries; broadcasting (except internet) and telecommunications; miscellaneous professional, scientific, and technical services; and performing arts, spectator sports, museums, and related activities

BEA U.S. Bureau of Economic Analysis
BERD Business Enterprise R&D
BLS U.S. Bureau of Labor Statistics
FFRD *Survey of Federal Funds for R&D*
HERD Higher Education Research and Development
NSF National Science Foundation
QCEW Quarterly Census of Employment and Wages
R&D Research and development
U.S. Bureau of Economic Analysis

301-278-9004
REIS@bea.gov
www.bea.gov