PI+ v2.2

Data Sources and Estimation Procedures

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A. Primary Historical Data

BEA

The primary national, state, and county data source for REMI PI$^+$ is the Bureau of Economic Analysis (BEA) State Personal Income (SPI) and Local Area Personal Income (LAPI) series (which also include employment and total population at both the state and county level). This data is available for the nation and states at the summary level (94 industries) beginning in 1998, and for counties at the sector level (24 industries) beginning in 2001. See BEA publication *Local Area Personal Income and Employment Methodology* (www.bea.gov/regional/pdf/lapi2016.pdf) for a complete description, extracts of which are used here.

The Bureau of Economic Analysis prepares annual and quarterly estimates of state personal income and annual estimates of state disposable personal income and employment. The state personal income accounts are detailed, timely, and comprehensive economic time series that provide comparisons among states and among industries within a state. Estimates of compensation (wages and salaries plus supplements to wages) and earnings (compensation plus proprietors' income) by place of work indicate economic activity of establishments within the state. Estimates of personal income by place of residence provide a measure of fiscal capacity. State disposable personal income provides a measure of income available for consumption and saving. Annual estimates of per capita personal income are an indicator of economic well-being of the residents of a state. State personal income is the income that is received by, or on behalf of, the residents of that state.

The Bureau of Economic Analysis also prepares annual estimates of personal income for local areas (counties, metropolitan areas, and the Bureau's BEA economic areas). Local area personal income is the only detailed, broadly inclusive economic time series for local areas that is available annually. The county estimates of personal income are conceptually and statistically consistent with the national estimates of personal income in the National Income and Product Accounts (NIPA). County estimates sum to state totals which, in turn, together with the District of Columbia, sum to a national total which equals the NIPA estimate except for some small differences in the treatment of U.S. residents working abroad, the income of foreign residents working in the U.S., and the use of more current source data.

Personal income is the income received by, or on behalf of, all persons from all sources: from participation as laborers in production, from owning a home or business, from the ownership of financial assets, and from government and business in the form of transfers. It includes income from domestic sources as well as from the rest of the world. It does not include realized or unrealized capital gains or losses.

Person is defined to include individuals, nonprofit institutions that primarily serve individuals, private noninsured welfare funds, and private trust funds.

Personal income for an area is the income received by, or on behalf of, all persons residing in the area, regardless of the duration of residence, except for foreign nationals employed by their home governments in the United States.

Alternatively, personal income can be defined as the sum of wages and salaries, supplements to wages and salaries, proprietors' income, dividends, interest, and rent, and personal current transfer receipts, less contributions for government social insurance.

Because the personal income of an area represents the income that is received by, or on behalf of, all the persons who live in that area, and because the estimates of the earnings component of personal income are made on a place-of-work basis, state and county personal income includes an adjustment for residence. The residence adjustment represents the net flow of compensation (less contributions for government social insurance) of intercounty commuters.

Industrial Classification

Since 2001, the North American Industry Classification System (NAICS), with some slight modifications, has been used for the private sector. The 2002 edition of NAICS was used for the years 2001-2006, the 2007 edition was used for years 2007- 2010, and the 2012 edition is used for subsequent years.

For the public sector, the income and employment are classified by level of government—federal, state, and local. The estimates for the federal government are sub classified into civilian and military.

The different treatment of the private and public sectors means that BEA's state and local government industry includes public education, public hospitals, and other types of government services while BEA reports only private schools in its educational services industry corresponding to the 3-digit NAICS industry 611 and only private hospitals in its hospitals industry corresponding to NAICS 622.

Place of Residence and Place of Work

Personal income, by definition, is a measure of the income received by persons, and the estimates of state and county personal income should reflect the residence of the income recipients. However, some of the data that are used to estimate some components of personal income are reported by the recipient's place of work rather than by his place of residence. Therefore, these components are estimated on a place-of-work basis, the amounts aggregated, and the aggregate (called the income subject to adjustment) adjusted to a place-of-residence basis. Thus the combination of the components of personal income plus the residence adjustment yields personal income on a place-of-residence basis.

The estimates of wages and salaries, employer contributions for employee pension and insurance funds, and contributions for government social insurance (by employers and employees) are mainly derived from data that are reported by place of work. These data are reported by industry in the state and county in which the employing establishment is located.

The estimates of nonfarm proprietors' income and contributions for government social insurance (by the self-employed) are derived from source data that are reported by the tax-filing address of the recipient. This address is usually that of the proprietor's residence; therefore, these data are assumed to be reported by place of residence.

The estimates of farm proprietors' income are derived from data that are reported by the principal place of production, which is usually the county in which the farm has most of its land and in which most of the work is performed. Because most farm proprietors live on, or near, their land, the place of residence is assumed to be the same as the place of work.

The estimates of rental income of persons, personal dividend income, personal interest income, personal current transfer receipts, and contributions for supplementary medical insurance and for veterans' life insurance are derived from data that are reported by the place of residence of the income recipient.

Employment

BEA gives equal weight to full-time and part time jobs in its estimates of employment. Wage and salary jobs and proprietors' jobs are counted, but unpaid family workers and volunteers are not. Proprietors' employment consists of the number of sole proprietorships and the number of general partners. Wage and salary employment is on a place of work basis. Proprietors' employment, however, is more nearly by place of residence because, for nonfarm sole proprietorships, the estimates are based on IRS tax data that reflect the addresses from which the proprietors' individual tax returns are filed, which are usually the proprietors' residences. Nonfarm partnership employment reflects the tax-filing address of the partnership, which may be either the residence of one of the partners or the business address of the partnership. Farm proprietors' employment is a count of operators running sole proprietorship and partnership farms estimated from U.S. Department of Agriculture data. The residence and place of work of farm proprietors' employment is assumed to be the same—the county in which most of farmland is located.

The employment estimates are designed to be consistent with the estimates of wages and salaries, proprietors' income, and earnings. The employment estimates are based on the same sets of source data as the corresponding earnings estimates and are prepared with parallel methodologies. However, two components of proprietors' income—the income of limited partnerships and the income of tax-exempt cooperatives—have no corresponding employment estimates.

Sources of the Data

The state and county personal income and employment estimates are based primarily on administrative records data. In addition some survey and census data are used.

The administrative records data are a byproduct of the administration of various federal and state government social insurance programs and tax codes. They may originate either from the recipients of the income or from the payer of the income. Some of the more important of these programs and taxes (and the agencies compiling the data) are:

- State unemployment insurance programs (Bureau of Labor Statistics, U.S. Department of Labor)
- State Medicaid programs and the federal Medicare program (Centers for Medicare and Medicaid Services, U.S. Department of Health and Human Services)
- Social Security (Social Security Administration)

• Federal veterans' programs (U.S. Department of Veterans Affairs)

• State and federal income tax codes (Internal Revenue Service, U.S. Department of the Treasury and Bureau of the Census, U.S. Department of Commerce)

The census data are mainly collected from the recipients of the income. The most important sources of census data for the personal income and employment estimates are the Census of Population and Housing, conducted by the Bureau of the Census every ten years and the Census of Agriculture, conducted by the U.S. Department of Agriculture (USDA) every five years, and the Census of Governments.

The survey data are collected from both the payers and the recipients of the income. The more important surveys include the Annual Survey of Public Pensions and the American Community Survey conducted by the Census Bureau and the monthly Current Employment Statistics survey conducted by the Bureau of Labor Statistics.

The estimates of farm proprietors' income rely principally on the USDA's estimates of the income of all farms. The USDA uses sample surveys along with census data and administrative-records data to develop its estimates. The estimates of military compensation and employment rely principally on tabulations of data provided by the U.S. Department of Defense.

Using administrative records data and census data to measure local area personal income has both advantages and disadvantages. By using these data, BEA can prepare detailed annual and quarterly estimates at a relatively low cost and without increasing the reporting burden on businesses and households. However, because the source data often do not precisely match the concept being estimated, they must be adjusted to compensate for differences in definitions, coverage, timing, and geographic detail.

Compensation

Compensation is the income received by employees as remuneration for their work. Compensation is the sum of wages and salaries and supplements to wages and salaries. Supplements to wages and salaries are the sum of employer contributions for government social insurance and employer contributions for employee pension and insurance funds. Compensation is reported by place of work.

The sources of data and the methods that are used to prepare the compensation estimates are described in two sections: wages and salaries and supplements to wages and salaries.

Wages and Salaries

Wages and salaries are broadly defined to include commissions, tips, and bonuses; voluntary employee contributions to deferred compensation plans, such as 401(k) plans; employee gains from exercising stock options; and receipts-in-kind that represent income.

Wages and salaries are measured before deductions, such as social security contributions, union dues, and voluntary employee contributions to defined contribution pension plans. They represent the amount of wages and salaries accrued during the year. The estimates are prepared, with a few exceptions, at the North American Industry Classification System (NAICS) three-digit industry level.

The national, state and county estimates of wages and salaries are based primarily on the Quarterly Census of Employment and Wages (QCEW) data that originate from the state unemployment insurance (UI) system, and from the UI program for federal civilian employees. These data are assembled by the Bureau of Labor Statistics (BLS) of the Department of Labor. The data (reported quarterly on Form ES-202, the state UI contribution reports filed by employers in the industries covered by, and subject to, each state's UI laws and by federal agencies) are tabulated by county and by NAICS six-digit industry.

Under most state UI laws, wages and salaries include bonuses, tips, and the cash value of meals and lodging provided by the employer—that is, pay-in-kind.

The estimates of wages and salaries for a few industries are prepared largely or entirely with data other than the QCEW data. These industries are either not covered by state UI or are only partly covered. For three of these industries—support activities for agriculture and forestry; private education; and religious, grantmaking, civic, professional and similar organizations—the estimates are prepared as the sum of (1) an estimate for the fully covered portion of the industry, based on the QCEW data, and (2) an estimate for the not fully covered portion of the industry, based largely or entirely on other source data, as discussed below.

Wages and salaries in industries fully covered by the UI programs

Estimates of wages and salaries covered by state UI programs or by the UI program for federal civilian employees are based on quarterly QCEW wage and salary (or payroll) data. However, these data do not precisely meet BEA's statistical and conceptual requirements; therefore, the data must be adjusted. These adjustments affect both the industrial and the geographic patterns of state and county personal income.

Adjustment for industry non-classification - The industry detail of the QCEW data regularly shows minor amounts of payroll—about 0.2 percent of total payrolls nationally—that have not been assigned to any industry. The industrial classification scheme used by BEA does not permit this not-elsewhere-classified category. Therefore, for each state and county, the amount in this category is distributed among the industries in proportion to the industry-classified QCEW payrolls. Because this adjustment only apportions the amount reported for a county within that county, no error is introduced into the total estimate for the county.

Adjustment for statewide reporting - A state UI contribution report is usually filed for each establishment by industry and by county; however, a report may be filed by an employer for a group of very small establishments by state, not by county. Therefore, county data are unavailable for these establishments.

The state totals of the wages and salaries reported for these statewide units for an industry are allocated to counties in proportion to the distribution of the wages and salaries for the industry that is reported by county. The statewide totals are allocated for each private-sector industry and for five government components—federal civilian, state education, state non-education, local education, and local non-education.

Adjustments for misreported wage and salary data - Approximately $82.4 billion of the wages and salaries not reported by employers is added to the QCEW. Because state and county data are unavailable, the national estimate for each industry is allocated to states and counties in proportion to the QCEW payroll data for the industry.

The national estimate for each industry is prepared in two parts. One part is prepared for the payrolls that were underreported, and one part is prepared for the payrolls that were not reported because employers failed to file a report.

In addition, tips are assumed to be understated in the UI contribution reports from the following industries: health and personal care stores; general merchandise stores; air transportation; railroad transportation; taxicabs, (a part of transit and ground passenger transportation); scenic and sightseeing transportation; couriers and messengers; administrative and support services; waste management and remediation services; amusement, gambling, and recreation industries; accommodation services; food services and drinking places; personal and laundry services; and religious, grant making, civic, professional and similar organizations. For each of these industries, the national estimate of the unreported tips is allocated to states and counties in proportion to the QCEW payroll data for the industry (or in proportion to Railroad Retirement Board data for the railroad transportation industry).

Further, the wages and salaries that employees contribute to tax-deferred thrift savings plans—such as 401(k) plans—had been omitted from the UI contribution reports of some employers in some states. This form of underreporting ended in 1997 in all states except Alaska. Beginning with 1996, Alaskan employers are no longer required to include employees' voluntary savings contributions with reported wages and salaries. Only the reported wages and salaries of the state government appear to have been affected by this change so far. A state control is allocated to counties in proportion to QCEW payroll data.

Adjustments for federal civilian payrolls - Large proportions of the QCEW data for the wages and salaries of the civilian employees of some federal government agencies in New York (through 2002) and Wisconsin (through 1998) were reported by state, not by county. Therefore, the county estimates of the wages and salaries of these employees were derived from employment data provided by the Office of Personnel Management (OPM).

Prior to 2002, the state estimates of the wages and salaries of the civilian employees of the Postal Service in New York were allocated to the counties in the state in proportion to the OPM employment data for the agency.

In addition, in the QCEW payroll data for federal civilian employees, all the wages and salaries for congressional staff are assigned to Washington, DC. However, some of these wages are earned by congressional staff who work in the state offices of the members of Congress. BEA assumes that 25 percent of the total congressional payrolls are earned by congressional staff in state offices, so this percentage of these payrolls is allocated to states in proportion to their congressional representation.

The state estimates of this adjustment are allocated to counties in proportion to the QCEW payroll data.

Adjustment for a component of state government payrolls - The geographic coding of the QCEW data for the non-education component of state government payrolls attributes too much of the payrolls to the counties of the state capitals in six states. Therefore, wage data from the decennial Census of Population and more recently, 5-year estimates from the annual American Community Survey (ACS), are used in the preparation of the county estimates of the wages and salaries for these employees.

The county estimates of the wages and salaries for the non-education component, for Illinois, Michigan, New Jersey, Rhode Island, Tennessee, and Wisconsin are based on wage data derived from unpublished decennial tabulations of journey-to-work (JTW) data from the Census for the years before 2001. Starting with 2008, the ACS JTW employment data was used, with 2001-2007 interpolated between the two JTW distributions.

Wage and salary estimates for the establishments of American Indian Tribal Councils are included with local governments.

Wages and salaries in industries not fully covered by the state UI programs

The estimates of wages and salaries for seven industries are primarily based on data other than QCEW data. The QCEW data are inadequate for five industries—farms, farm labor contractors, private elementary and secondary schools, religious organizations, and private households—because these industries are fully covered by state UI programs in only a few states. The QCEW data are unavailable for two industries—railroads and military—because these industries are not covered by state UI programs. Consequently, the wages and salaries of all seven industries are treated as if they were not covered by state UI programs. In addition, because these estimates are primarily based on data that do not include wages paid in kind, an estimate of pay-in-kind is prepared for each of these industries except farm labor contractors, and railroads.

Farms - The estimates of wages and salaries for farms consist of cash wages, including the salaries received by the owner-operators of farm sole proprietorships, partnerships, and family-held corporations, and the pay-in-kind of hired farm labor.

The state estimates of cash wages are based on estimates of hired farm cash wages and operator wages prepared by the Department of Agriculture. Estimates for most states are allocated to counties by the distribution of wages paid to farm employees from the Census of Agriculture. However, farm employees have mandatory UI coverage or almost complete voluntary coverage in Arizona, California, Connecticut, Delaware, Florida, Hawaii, Massachusetts, New Jersey, Rhode Island, and Washington. Therefore, county estimates of cash wages for these states are derived from QCEW data.

State estimates of pay-in-kind are based on estimates prepared by the Department of Agriculture and are allocated to counties in proportion to the number of hired farm workers who worked 150 days or more from the Census of Agriculture.

Farm labor contractors - Farm labor contractors are classified in support activities for agriculture and forestry. Farm labor contractors and their employees are only partially covered by UI laws in most states so most state and county estimates of wages are based on data for contract farm labor expenses from the Census of Agriculture. Since in Arizona and California all employees in this industry are covered, estimates are based on QCEW payroll data.

Railroads - The estimates of the wages and salaries of railroad employees are based mainly on data provided by the Railroad Retirement Board (RRB), which administers the Railroad Unemployment Insurance and Retirement systems. The railroad industry is not covered by state unemployment insurance, and the RRB does not require railroads to submit employment and wage data by establishment. However, the RRB does collect data from each railroad company on its total payroll, and, for each railroad company employee, on the wages and salaries that are subject to the railroad UI and retirement tax. The state and county of residence of each employee can also be identified in the RRB records.

The estimates of railroad wages and salaries by state and county of employee residence are based on the sum of the wages of employees whose wages do not exceed the ceiling for RRB taxation plus estimates of the wages of the employees with wages above the ceiling. To estimate the latter, the national total of the wages of railroad employees receiving below-ceiling wages—summed from the RRB employee data—is subtracted from the national total of the payrolls of all railroad companies—summed from the RRB company data—to yield the total of the wages of the employees with above-ceiling wages. This total is allocated to states and counties in proportion to the number of employees receiving above-ceiling wages, as determined from the RRB employee data.

To be consistent with the estimates of wages and salaries for other industries, the state and county estimates of railroad wages and salaries are converted to a place-of-work basis. This is accomplished through the use of unpublished journey-to-work (JTW) data for railroad employees from the 2000 Census of Population. From these data, the proportion of the wages of railroad employees who lived in one county but worked in another was calculated. Each of these proportions was multiplied by the corresponding place-of-residence wage estimates to calculate the intercounty flows of wages due to commuting; each of these flows was subtracted from the county of residence and added to the county of work to adjust the place-of-residence wage estimates to a place-of-work basis.

The current year state and county estimates of railroad wages and salaries reflect the geographic distribution of the previous year estimates.

Private elementary and secondary schools - State estimates of cash wages of private school employees are based on data from the Census Bureau's annual *County Business Patterns* (CBP) data, the data with the most uniform national coverage. State estimates of pay-in-kind reflect the number of full-time teachers in religious orders from the *Official Catholic Directory*.

In about half of the states, the county estimates of cash wages and pay-in-kind are derived from the best available series chosen from (1) data on employment in private elementary and secondary schools published by the state departments of education, (2) employment data from the U.S.

Department of Education's Survey of private elementary and secondary schools, or (3) relevant wage data from *County Business Patterns*.

In the other states, the UI coverage is complete enough so that the QCEW data can be used as the basis for the county estimates. In these states, the QCEW distribution of wages and salaries is the basis for the estimates of cash pay, and the QCEW distribution of employment is the basis for the estimates of pay-in-kind.

Religious organizations - The state estimates of cash wages and pay-in-kind of religious organizations are based on CBP data. However, the CBP county data are too frequently suppressed to avoid disclosure of information about individual organizations to be useful; therefore the state estimates are allocated to counties in proportion to the distribution of the civilian population.

Private households - The distribution of county level wages is based on Census Journey to Work (JTW) county-level data from the 2000 decennial Census of Population. The JTW data were extrapolated to the present by the annual change in the household population. The extrapolated series for each year is adjusted proportionately to sum to the state estimates of cash wages. Estimates of pay-in-kind for private household employees are allocated to counties by BEA estimates of private household wage and salary employment.

Military - Estimates of wages and salaries for the military consist of estimates of cash wages (including allowances) of full-time military personnel and members of the military Reserves, including the National Guard, and of estimates of the pay-in-kind provided to enlisted personnel.

For military bases that extend across county boundaries, source data by county are available only for Forts Benning, Gordon, and Stewart, Georgia; for Wright-Patterson Air Force Base, Ohio; and for Quantico Marine Corps Base, Virginia; the data for each of the other intercounty bases are assigned to the county that contains the base headquarters.

State estimates of cash wages for full-time military personnel, are allocated to counties in proportion to the number of personnel for the Coast Guard from the Department of Homeland Security and to the county personnel estimates prepared by the Department of Defense for each of the other services.

State estimates of cash wages for the Reserves are based on data from the appendix of the *Budget of the United States Government*. Because county payroll data are unavailable, the state estimates are allocated to counties in proportion to the distribution of the civilian population.

The national estimate for the pay-in-kind of the full-time personnel of each service is allocated to states and counties in proportion to the number of enlisted personnel.

Other adjustments - The QCEW payroll data for some industries exclude small portions of wages and salaries either because the employing establishments are not covered by the UI programs or because a portion of the establishments' payrolls is not subject to UI reporting. The following procedure is used to prepare county estimates of these non-covered wages.

National estimates of non-covered wages are prepared and allocated to states on the basis of the best available related economic series. The state estimates of the non-covered wages are added to the

QCEW payroll data for the relevant industries. Then, the national estimates of wages and salaries (both covered and non-covered portions) are allocated by industry to states in proportion to the augmented QCEW data.

The state estimates of wages and salaries (both covered and non-covered portions) are allocated to the counties in proportion to the unaugmented QCEW data. This procedure is used to prepare county estimates of the following items:

• Payrolls of railroad carrier affiliates, which are classified in support activities for transportation, and payrolls of railway labor organizations, classified in religious, grant making, civic, professional, and similar organizations;

• Contributions to cafeteria plans that are excluded from QCEW payroll data for private industries and state and local governments in twenty-eight states;

• Payrolls of nonprofit organizations, in numerous industries, that are exempt from UI coverage because they have fewer than four employees;

• Wages and salaries of students employed by the institutions of higher education in which they are enrolled, which are classified in private education, state government education, and local government education;

• Pay-in-kind of the members of religious orders who teach at private colleges and universities but who do not receive cash wages;

• Pay-in-kind of workers in private hospitals who do not receive cash wages (mainly interns, student nurses, and members of religious orders);

• Salaries of elected officials, members of the judiciary, and hospital interns in state and local governments;

• Commissions received by insurance solicitors and real estate agents;

• Transportation subsidies paid to federal civilian employees who use mass transit to commute to and from work and allowances paid to federal civilian employees in selected occupations for uniforms;

• Prisoner compensation, in counties where prisons are located, in federal government and in state government non-education;

• Compensation to justices of the peace for marriage fees in local government non-education;

• Compensation to jurors and expert legal witnesses in state government non-education

Alternative measure of county wages

Another measure of county wages by place of work is the payroll data published in the Census Bureau's *County Business Patterns* (CBP). It differs in source data and coverage from BEA's wages and salaries and QCEW wages.

The CBP data are derived from Census Bureau business establishment surveys and federal administrative records.

The coverage of the CBP data differs from that of the QCEW data primarily because the CBP data exclude most government employees, while the QCEW data cover civilian government employees. CBP data also exclude several private industries covered at least in part by the QCEW: crop and animal production; rail transportation; insurance and employee benefit funds; trusts, estates, and agency accounts; and private households. However, the CBP data cover the employees of educational institutions, membership organizations, and small nonprofit organizations in other industries more completely than the QCEW data.

Beginning in 2001, QCEW classifies employees of Indian tribal governments and enterprises in local government. These employees were previously classified in the relevant private industries. In the CBP data, these employees are still classified in private industries.

Supplements to Wages and Salaries

Supplements to wages and salaries consist of employer contributions for employee pensions and insurance funds (previously called other labor income) and employer contributions for government social insurance. For most components of supplements to wages and salaries, county-level source data are not available and so state estimates are allocated to counties on the basis of wages or employment. See BEA's *State Personal Income and Employment Methodology* for a full description of each component of supplements and the data sources and estimation methods used for the state estimates.

Employer contributions for employee pension and insurance funds

State estimates of employer contributions for the following funds are distributed to counties, by industry, using the allocator noted:

Pension plans and insurance funds

• **Defined benefit and defined contributions plans -** BEA estimates of private and government wages and salaries.

• **Group health insurance plans -** BEA estimates of private and government employment.

• **Group life insurance plans -** BEA estimates of private and government wages and salaries

• **Supplemental unemployment benefit plans** - BEA estimates of private wages and salaries.

• **Privately administered workers' compensation plans** - BEA estimates of wages and salaries.

Employer contributions for government social insurance

Employers contribute on behalf of their employees to several government social insurance programs.

County-level source data are used to prepare estimates of employer contributions for state unemployment insurance (UI) programs. Estimates of **state UI taxes on employers** and **federal unemployment taxes** are based on unpublished employer contributions data by county and industry provided by the Bureau of Labor Statistics of the U.S. Department of Labor.

County-level estimates of employer contributions for all other government social insurance programs are distributions of state-level estimates, by industry, using the allocator noted:

• **Old-Age, Survivors, and Disability Insurance (OASDI) and Hospital Insurance (HI).—** BEA estimates of private wages and salaries that have been adjusted so that the average wage for each county and industry does not exceed the annual maximum taxable wage. Military wages and salaries are adjusted to exclude pay-in-kind. Most employers contribute to both the OASDI and HI programs on behalf of their employees. However, employees of the rail transportation industry, federal employees in the Civil Service Retirement System, and some state and local government employees covered under their employers' pension programs are covered by the HI program but not by the OASDI program.

• **Railroad retirement and railroad employees' unemployment insurance**— BEA estimates of wages and salaries for rail transportation.

• **Unemployment Compensation for Federal Employees (UCFE) and Unemployment Compensation for Ex-Service Members (UCX)** - BEA estimates of wages and salaries for civilian federal government and wages and salaries excluding pay in kind for active duty military personnel.

• **Military medical insurance** and **veterans' life insurance —**BEA estimates of military wages and salaries excluding pay in kind.

• **Pension benefit guaranty**—BEA estimates of wages and salaries for private industries.

• **Federal workers' compensation—**BEA estimates of wages and salaries for civilian federal government.

• **State-administered workers' compensation—**BEA estimates of wages and salaries.

• **State-administered temporary disability insurance**—BEA estimates of wages and salaries. New Jersey is the only state that requires employers to contribute to this program.

Proprietors' Income

Proprietors' income with inventory valuation and capital consumption adjustments is the current-production income of sole proprietorships and partnerships and of tax-exempt cooperatives. A sole proprietorship is an unincorporated business required to file Schedule C of IRS Form 1040 (*Profit or Loss from Business*) or Schedule F (*Profit or Loss from Farming*). A partnership is an unincorporated business association required to file Form 1065 (*U.S. Return of Partnership Income*). A tax-exempt cooperative is a nonprofit business organization that is collectively owned by its customer-members. Proprietors' income includes corporate directors' fees, but it excludes the imputed net rental income of owner-occupied housing as well as the dividends and the monetary interest that are received by nonfinancial sole proprietorships and partnerships.

The estimates of proprietors' income are prepared in two parts—nonfarm proprietors' income and farm proprietors' income.

Nonfarm Proprietors' Income

The estimation of nonfarm proprietors' income will be discussed in two parts: (1) the income received by nonfarm sole proprietorships and partnerships, and (2) the income received by tax-exempt cooperatives.

Income of nonfarm sole proprietorships and partnerships

National estimates of the income of nonfarm sole proprietorships and partnerships are based on tabulations of Internal Revenue Service (IRS) tax returns: (1) "net profit or (loss)" reported on Schedule C of Form 1040 for sole proprietorships; (2) "ordinary business income (loss)" from Form 1065 for partnerships; and (3) "net rental real estate income (loss)" plus "other net rental income (loss)" from Schedule K of Form 1065.[2] Collectively, these amounts are referred to as net profits. Because these data do not always reflect the income earned from current production and because they are incomplete, the estimates also include three major adjustments—the inventory valuation adjustment (IVA), the capital consumption adjustment (CCAdj), and the misreporting adjustment.

The IVA removes the effects of gains and losses that result from changes in the prices of products withdrawn from inventories.

The capital consumption adjustment represents the difference between capital consumption allowances (depreciation on the historical-cost basis used in the source data) and the consumption of fixed capital (depreciation valued on a replacement-cost basis and the effects of the accidental destruction of depreciable plant and equipment).

The misreporting adjustment is an estimate of the net income of sole proprietors and partnerships that is not reported on tax returns. This adjustment accounted for 44 percent of nonfarm proprietors' income in 2016.

The source data necessary to prepare these adjustments are available only at the national level. Therefore, the national estimates of nonfarm proprietors' income that include the adjustments are allocated to states, and these state estimates are allocated to the counties, in proportion to tax return data that do not reflect the adjustments.

Like the national estimates, the state estimates are based on data tabulated from Schedule C of Form 1040 and from Form 1065. The geographic coding of the data is by tax-filing address. This address is assumed to be the same as the address of the place of residence.

National estimates of nonfarm proprietors' income—including the IVA, the CCAdj and the misreporting adjustment—for 2001 forward by North American Industry Classification System

(NAICS) subsectors are allocated to the states using a 3-year moving average of state level tabulations of net profits.

The IRS county data at the NAICS three-digit (subsector) level could not be used because the data are severely impaired by a large number of suppressions required to prevent the disclosure of confidential information. Consequently, the county estimates for 2001 forward were prepared in two steps. First, the two-digit (sector) level state estimates were allocated to the counties using a 3-year moving average of the tabulations of net profits by county by sector. Next, the state subsector estimates were used to allocate the county sector estimates to subsectors.

Income of nonfarm tax-exempt cooperatives

The income of tax-exempt cooperatives consists of the income that is received by rural electric cooperatives, rural telephone cooperatives, and agricultural cooperatives.

The state estimates of the income of rural electric and telephone cooperatives are allocated to counties in proportion to estimates of proprietorship and partnership income, excluding the misreporting adjustment in broadcasting and telecommunications (for rural telephone cooperatives) and utilities (for rural electric cooperatives).

Agricultural cooperatives are mainly farm marketing cooperatives and farm supply cooperatives; they are classified in wholesale trade. The state estimates of the income of these cooperatives are allocated to counties in proportion to the income of sole proprietorships and partnerships, excluding the misreporting adjustment, in the nondurable wholesale trade industry.

Farm Proprietors' Income

Farm proprietors' income consists of the income that is received by the sole proprietorships and the partnerships that operate farms. It excludes income received by corporate farms.

The national and state estimates of farm proprietors' income are primarily derived from estimates of the income of all farms that are prepared by the U.S. Department of Agriculture (USDA). The concepts that underlie the USDA national and state estimates of farm income are generally the same as those that underlie the BEA estimates of farm proprietors' income. However, the USDA estimates of farm income include the net value of CCC loans, the net rental value of farm housing and the income of corporate farms; exclude sales and purchases of livestock between farms and a measure of the change in farm inventories of materials and supplies; and use a measure of depreciation different from BEA's measure.

BEA's county estimates of farm proprietors' income for 2007-2014 are primarily derived from county data from the 2007 and 2014 Censuses of Agriculture and from select annual county data from the state offices that are affiliated with the National Agricultural Statistics Service (NASS) of the USDA. In addition, data from other sources within the USDA, such as the Farm Service Agency, are used.

The process consists of three major steps. First, estimates of the "realized net income" of all farms (corporate and unincorporated) are computed as gross receipts less production expenses. Second, the estimates of realized net income are modified by the inventory change adjustment so that only the income and expenses from current production are measured. This modification yields estimates of the “total net income” of all farms. Third, the income of corporate farms is estimated and subtracted from the estimates of total net income to yield farm proprietors’ income.

For 2007 and 2014, the county estimates of 14 components of gross receipts, 12 categories of production expenses, and three categories of the value of the net change in inventories are derived mainly from the Census of Agriculture for those years. For 2008- 2011 and for 2013-2014, the county estimates for each state are prepared in the component detail that corresponds to the best annual county data available for the state. The county estimates of each of these components are controlled to BEA’s state estimates.

Farm gross receipts

The estimates of gross receipts of all farms consist primarily of the following items: (1) Cash receipts from farm marketing of crops and livestock, (2) receipts from other farm-related activities, including recreational services, sales of forest products, and custom-feeding services performed by farm operators, as well as indemnity payments (benefits) from crop insurance (3) payments to farmers under several federal government farm subsidy programs, and (4) the imputed value of home consumption, which is the value of the farm products (food and fuel) produced and consumed on farms.

The largest component of gross receipts is cash receipts from marketing. The USDA state estimates include cash receipts from the marketing of about 150 crop and livestock commodities, but the county estimates are prepared in much less detail. Annual county estimates of cash receipts—usually for total crops and for total livestock—for 13 states are prepared by NASS-affiliated state offices. BEA uses these estimates to allocate the USDA state estimates to the counties in these states.

For the other states, the USDA state estimates of cash receipts from the marketing of each commodity are summed into the seven groups of crops and the five groups of livestock for which county data for value of sales are available from the Censuses of agriculture. The state estimates of cash receipts for these groups for 2007 and for 2012 were allocated to counties by the related Census data.

For the counties of some of these states, estimates of cash receipts for select groups of commodities were interpolated between 2007 and 2012 and extrapolated to 2014 by value-weighted estimates of annual crop production and livestock inventories. These estimates were constructed from supplemental NASS data using marketing year average prices for each commodity as the weights. The state estimates for 2008-2011 and for 2013-2014 were allocated to counties in proportion to the interpolated and extrapolated county estimates for those years.

For the remaining commodities and for all commodities in states for which no annual county data are available, the 2007 and 2012 state estimates of cash receipts were allocated to counties in proportion to the corresponding Census data for those years. The 11 Receipts for recreation services are for providing facilities for recreational activities, such as fishing, hunting, and camping. 12 County estimates of cash receipts are currently available for California, New Mexico, and North Carolina. Previously, county estimates were available for Alabama, Arizona, Hawaii, Illinois, Kentucky, New

York, Ohio, Pennsylvania, Oregon, and South Carolina. Between 2009 and 2014, these estimates were discontinued by the NASS offices, but the last available data is still used to allocate the state estimates through 2012. November 2017 Proprietors' Income III-5 2008-2011 county estimates reflect interpolations between the 2007 and 2012 Census data, and the 2013-2014 estimates reflect the 2012 Census data.

State estimates of the receipts from other farm-related activities for 2007-2014 were similarly allocated to counties in proportion to data for the receipts from these activities from the Censuses or from interpolations between the Censuses. Data on crop indemnity payments from crop insurance from the Risk Management Agency, USDA was used to allocate the 2008-2014 state estimates of crop insurance indemnities.

State estimates of federal government payments to farmers for 2007-2014 were allocated to counties in proportion to annual tabulations of the payments from the Farm Service Agency data plus conservation payments data from the Natural Resource Conservation Service of USDA.

County source data that reflect the imputed value of home consumption are unavailable. Therefore, the county estimates are based on the distribution of the number of farms reported in the Censuses.

Farm production expenses

State estimates of most farm production expenses for 2007 and 2012 were allocated to counties in proportion to production expense data from the Censuses for those years; the 2008-2011 county estimates are based on interpolations of the data from the Censuses, and the 2013-2014 estimates are based on data from the 2012 Census.

Inventory change adjustment

The adjustment for inventory change is an estimate of the value of the net change during the year in farm inventories of the livestock and crops held for sale and private farm inventories of materials and supplies (i.e., purchased inputs such as feed, seed, fertilizer, and chemicals). This estimate is added to the estimate of realized net income in the second major step in the calculation of farm proprietors' income, so that farm proprietors' income for a year will include only the farm income and production expenses during the year, or from *current* production. The sum of realized net income and the value of the net change in inventories is total net income.

The role of the inventory change adjustment in the derivation of net farm income is illustrated by the following examples. For crops, the value of the net change in inventories is negative when farmers feed more crops to their animals or sell more crops than they produce during the year; the amount held in inventory declines and realized net income overstates the income from current production by the value of the net withdrawals from inventory. For livestock, the value of the net change in inventories is positive when the number of animals that are born or that farmers purchase is greater than the number that they sell during the year; the size of the herds increase and the realized net income understates the income from current production by the value of the net increase in the herds. For materials and supplies, the value of the net change in inventories is positive when farmers purchase more raw materials and supplies than they consume during the year; the amount held in inventory rises and the realized net income overstates the expenses from current production by the value of the net increase in the private inventories of materials and supplies.

Annual county data for the number of cattle and swine on farms are available from NASS for some states. The 2007-2014 state estimates of the value of the net change in livestock inventories on farms for these states were allocated to the counties in these states in proportion to the number of livestock of each type in farm inventories at the end of each year. The county estimates for the other states are based on the county distribution of the number of livestock units in farm inventories reported in the 2007 and 2012 Censuses.

State estimates of the value of the net change in crop inventories were allocated to counties by the annual data for crop production from NASS. If the NASS data were unavailable, the 2007 and 2012 state estimates were allocated by the data for crop production from the Censuses for those years, the 2008-2011 state estimates were allocated by the interpolations of the data from the Censuses, and the 2013-2014 state estimates were allocated by the data from the 2012 Census.

The 2007 and 2012 state estimates of the value of the net change in materials and supplies inventories are allocated to counties using production expenses from the Censuses for: feed, seeds, commercial fertilizer, agricultural chemicals, and petroleum products. The 2008-2011 state estimates were allocated by the interpolations of the data from the Censuses, and the 2013-2014 state estimates were allocated by the data from the 2012 Census.

Adjustment to exclude the income of corporate farms

An adjustment to exclude the income of corporate farms is made in the third major step in the calculation of farm proprietors' income, because the estimates of total net income of all farms calculated in the second major step include the income of corporate farms.

The adjustment is calculated in four steps. First the ratio of total crop and livestock sales of corporate farms to the total crop and livestock sales of all farms is computed for each county using unpublished tabulations from the 2007 and 2012 Censuses. The ratio is interpolated between the Censuses and the 2012 ratio is used for the 2013-2014. Second, the adjustment ratio is multiplied by the county estimate of the total net income of all farms in order to derive the initial estimate of corporate farm income for each county. Third, the state estimates of corporate farm income are allocated to counties in proportion to the initial county estimates. Fourth, the allocated county estimates of the income of corporate farms for each county are subtracted from the estimates of the income of all farms to obtain estimates of farm proprietors' income.

Dividends, Interest, and Rent

Personal dividend income, personal interest income, and rental income of persons with capital consumption adjustment are collectively known as property income.

Personal Dividend Income

Personal dividend income is the cash and other assets, excluding the corporations' own stock that persons who are U.S. residents receive from U.S. and foreign corporations. The county estimates of personal dividend income are prepared in two parts: (1) imputed receipt of dividend income from pension plans, and (2) all other dividend income.

Imputed receipt of dividend income from pension plans

The imputed receipt of dividends from pension plans consists of the dividends received by noninsured pension plans and passed through to persons. Separate estimates are prepared for imputed receipts from pension plans for private sector employees' plans, for the federal civilian employees' Thrift Savings Plan (TSP), and for state and local government employee pension plans. For each of these categories, a portion of the dividends is assumed to be received on behalf of current employees, and a portion on behalf of retirees and their survivors.

For private pension plans, the state estimates of the currently employed portion are allocated to counties using place-of-residence private wage and salary estimates. The state estimates of the retired portion are allocated to counties using BEA estimates of Social Security benefits.

For the dividends received by the Thrift Savings Plan, the state estimates of the currently employed portion are allocated to counties using residence-adjusted county estimates of federal civilian wages and salaries; the state estimates of the retired portion, are allocated by federal retirement & disability payments data from the Census Bureau's *Consolidated Federal Funds Report.*

For the dividends received by the state and local government employee retirement plans, the state estimates of both the currently employed and the retired portions are allocated to counties using residence-adjusted county estimates of state and local government wages and salaries.

Other dividend income

State estimates of other dividend income are allocated to counties using county tabulations of dividends reported on individual income tax return Form 1040 from the Individual Master File (IMF) of the Internal Revenue Service (IRS).

Personal Interest Income

Personal interest income is the interest income (monetary and imputed) of persons, including individuals and nonprofits serving households, from all sources. The county estimates of personal interest income are prepared in three parts: (1) monetary interest income, (2) the imputed receipt of interest income from pension plans, and (3) other imputed interest income.

Monetary interest income

The state estimates of monetary interest income are allocated to counties on the basis of the taxable interest reported by individuals on IRS Form 1040 and included in the IRS Individual Master File (IMF). The IMF interest data are supplemented by an estimate of the interest received by individuals from regulated investment companies, such as money market mutual funds. The supplementation is necessary because the interest received by individuals from regulated investment companies is reported as dividend income on Form 1040 but is treated as interest income in BEA's state personal income accounts. County estimates of the interest received from regulated investment companies are based on a national ratio of such interest to IMF dividends and county-level estimates of IMF dividends.

Imputed interest receipts

From employee pension plans - The imputed receipt of interest income from pension plans consists of the monetary and imputed interest received by noninsured pension plans and passed through to persons. 5Separate estimates are prepared for imputed receipts from private sector pension plans, federal civilian employee pension plans (including the Thrift Savings Plan), the military retirement plan, and state and local government employee pension plans. For each of these categories, a portion of the interest is assumed to be received on behalf of current employees, and a portion on behalf of retirees and their survivors. For private plans, federal civilian employee plans and state and local government plans these portions are determined using the same sources as described above for dividends.

The state estimates of the imputed receipt of interest income from private pension plans, federal civilian plans and by state and local government plans are allocated to counties in the same manner described above for the dividends they receive. For military pension plans, the portion of the imputed receipt of interest income attributed to active duty military and reservists is allocated to counties on the basis of BEA estimates of residence-adjusted base pay of active-duty military personnel. The state estimates of the portion attributed to annuitants are allocated to counties using military retirement and disability payments data from the Census Bureau's *Consolidated Federal Funds Report*.

From financial and insurance companies - Imputed interest income consists of (a) the value of depositor services furnished without payment by financial intermediaries except life insurance carriers, (b) premium supplements for property and casualty insurance, and (c) the interest received from life insurance carriers.

The imputed value of depositor services is an estimate of the value of services such as checking and record keeping that financial intermediaries (banks, credit agencies, and regulated investment companies) provide to persons without an explicit charge.

Premium supplements for property and casualty insurance is the property income that property and casualty insurance carriers earn on reserves held to pay claims. This income is deemed to be paid out to policyholders and then paid back as premium supplements even though in actuality the insurance companies retain the property income.

The imputed interest received from life insurance carriers consists of the property income life insurance carriers earn on life insurance and annuity reserves. This income is deemed to be paid out to policyholders and then paid back as premium supplements even though in actuality the insurance companies retain the property income.

State estimates of aggregate imputed interest are allocated to counties in the same manner as monetary interest income.

Rental Income of Persons

The rental income of persons with capital consumption adjustment is the net current-production income of persons (except those primarily engaged in the real estate business) from the rental of real property; the imputed net rental income of owner-occupants of farm and nonfarm dwellings; and the royalties received by persons from patents, copyrights, and rights to natural resources.

Monetary rental income

The county estimates of monetary rental income are prepared in two parts: (1)

monetary rental income from farms owned by nonoperator landlords, and (2) other monetary rents and royalties.

Monetary rental income from farms owned by nonoperator landlords - The national estimate of net monetary rents received by farms owned by nonoperator landlords is allocated to the states—and the state estimates to counties-—in proportion to estimates of the gross imputed rental value of farm dwellings from the USDA Economic Research Service.

Other monetary rents and royalties - Because the available state and county data are unreliable, the national estimate of net rent and royalties received by individuals, (excluding net rents to farm operators), is allocated to states—and the state estimates, to counties—in proportion to the tabulations of IMF data for gross rents and royalties reported on Schedule E of Form 1040.

Imputed rental income

Imputed rent is an imputation for the net rental income of owner-occupied housing. It is based on the assumption that owner-occupants are in the rental business and that they are renting the houses in which they live to themselves: As tenants, they pay rent to the landlords (that is, to themselves); as landlords, they collect rent from their tenants (that is, from themselves), they incur expenses, and they may have a profit or a loss from the rental business. The county estimates of imputed net rental income are prepared in two parts: imputed net rent received by the owner-occupants of mobile homes and imputed net rent received by the owner-occupants of all other dwellings.

Imputed net rent from mobile homes - The state estimates of imputed net rent from mobile homes were allocated to counties in proportion to the number of mobile homes from the Census of Housing. Intercensal estimates of gross rental values are straight-line interpolations of the Census benchmarks. County data from the 2000 Census of Housing are used for all subsequent years.

Imputed net rent from all other dwellings - State estimates of imputed net rent from all other dwellings were allocated to counties using estimates of the rental value of owner-occupied dwellings. For Census years, estimates of the gross rental value of owner-occupied single-family dwellings were derived from Census of Housing data. Intercensal estimates of gross rental values are straight-line interpolations of the Census benchmarks. County data from the 2000 Census of Housing are used for all subsequent years.

Personal Current Transfer Receipts

In personal income, transfer receipts are benefits received by persons for which no current services are performed. They are payments by government and business to individuals and nonprofit institutions.

Estimates are prepared for approximately 50 subcomponents of transfer receipts. For organizational convenience, the subcomponents are classified by source—government or business—and by recipient—individuals or nonprofit institutions. In this discussion, transfer receipts consists of three major components—receipts of individuals from governments, receipts of nonprofit institutions, and receipts of individuals from businesses.

At the county level, approximately 75 percent of the estimates of transfer receipts are derived from direct measures of the receipts; for some programs, data may be drawn from Census Bureau publications, including *State Government Finances, State and Local Government Finances*, and the discontinued *Consolidated Federal Funds Report* (CFFR) and *Federal Assistance Award Data System* (FAADS). The remaining 25 percent are allocations of state estimates in proportion either to data that are related to the components or to the most relevant population series, e.g. household population which is total population minus those living in group quarters.

Each subcomponent is briefly defined and the preparation of the county estimates is described.

Current Transfer Receipts of Individuals from Governments

Retirement and disability insurance benefits

Social Security benefits - These benefits, consist mainly of monthly benefits received by retired and disabled workers, dependents, and survivors and lump-sum benefits received by survivors. The state estimates are based on annual tabulations of payments from the Social Security Administration (SSA). The county estimates are based on SSA tabulations of the amount of monthly benefits paid to those in current-payment status on December 31 by county of residence of the beneficiaries.
Railroad retirement and disability benefits - These benefits are received by retired and disabled railroad employees and their survivors under the federal program of retirement insurance for railroad employees, who are not covered by Social Security. The state estimates are based on payments data from the Census Bureau's annual CFFR. The county estimates are based on payments data from the Census Bureau's quarterly FAADS.

Workers' compensation - This compensation is received by individuals with employment-related injuries and illnesses from publicly administered workers' compensation insurance from both the federal and state governments.

The state estimates of the compensation received under the federal program, which covers only federal civilian employees, are based on fiscal year data from the Census Bureau's annual CFFR. In the absence of data for counties, the state estimates are allocated to counties in proportion to estimates of federal civilian wages and salaries, which are adjusted to a place-of-residence basis.

State-administered workers' compensation funds consist of exclusively state-administered workers' compensation insurance programs, state-administered insurance programs that compete with private insurance programs, and state programs for second-injury funds. State estimates of benefits paid by state of work are derived from the Census Bureau's annual *State Government Finances*. These data are adjusted to a place-of-residence basis by BEA. In the absence of payments data for counties, the state estimates are allocated to counties by the sum of the estimates of wages and salaries for private employees and state and local government employees, which are adjusted to a place-of-residence basis.

Other government retirement and disability insurance benefits - These benefits consist of temporary disability benefits, black lung benefits, and benefits from the Pension Benefit Guaranty Corporation.

Temporary disability benefits - are received by workers who are unemployed because of non-occupational illnesses or injuries. These benefits are from state-administered programs only in California, New Jersey, New York, and Rhode Island. The state estimates are allocated to counties in proportion to household population.

Black lung benefits - are received by coal miners who are totally disabled by black lung disease (pneumoconiosis) and by the eligible survivors of miners whose deaths were caused by the disease. Individuals whose eligibility was established before July 1973 receive their benefits from the Social Security Administration (SSA); those whose eligibility was established since June 1973 receive benefits from the Department of Labor (DOL). County estimates of the benefits received from each agency are based on data from the CFFR.

Pension Benefit Guaranty benefits - are paid by the revolving fund of the Pension Benefit Guaranty Corporation (PBGC) to individuals whose PBGC-insured pensions cannot be paid by the private pension funds that are liable for the benefits. The national estimates are allocated to states based on payments data from PBGC. The state estimates are allocated to counties in proportion to Social Security benefits, which are assumed to reflect the geographic distribution of the retired population.

Medical benefits

Medicare benefits - These benefits are federal government payments made directly or through intermediaries to vendors for the care provided to individuals under the Medicare program. The state estimates of the benefits received under the Medicare provisions for Hospital Insurance and Supplementary Medical Insurance are based on estimates of payments by state of residence as reported by the Centers for Medicare and Medicaid Services (CMS).

The state estimates are allocated to counties by the product of CMS data on the total number of enrollees by county in the Medicare Hospital Insurance and Supplementary Medical Insurance programs times a measure of fee for service payments per enrollee by county based on CMS data from the rate setting program for Medicare Advantage. Estimates beginning with 2006 also include Medicare Prescription Drug Plan (Part D). The national control for Part D was allocated to states and counties by the counts from CMS of the number of enrollees in Part D.

Medicaid benefits - These medical benefits are received by low-income individuals. The benefits consist mainly of the payments made directly or through intermediaries to vendors for care provided to individuals under the federally assisted, state-administered Medicaid program and the Title XIX Medicaid expansion portion of the Children's Health Insurance Program (CHIP).

The state estimates are based on payments data from CMS. For about two-thirds of the states, the county estimates of payments made under both Medicaid are based on Medicaid payments data from the state departments of social services. For a year or years for which the data are not available, the available data are interpolated or the most recent year is used to prepare the county estimates. For the states for which payments data are not available by county, the state estimates of all benefits received are allocated to counties in proportion to BEA's estimates of family assistance.

The county estimates of Title XIX CHIP benefits are based on enrollment data from the various state departments of social services. For counties in states that do not provide these data, the state estimates are allocated in proportion to the estimate of children age 0-17 in poverty from the Census Bureau's *Small Area Income and Poverty Estimates*.

Other medical care benefits - These benefits are received by low-income individuals. The benefits consist mainly of the payments made directly or through intermediaries to vendors for care provided to individuals under the Title XXI of the federally assisted, state-administered Children's Health Insurance Program (CHIP), and under the general assistance medical programs of state and local governments. The state estimates of the payments made under the CHIP are based on data from CMS. The state estimates of payments made under the general assistance medical programs are based on data that are obtained from state departments of social services by CMS. The county estimates of Title XXI CHIP benefits are based on enrollment data from the various state departments of social services. For counties in states that do not provide these data, the state estimates are allocated in proportion to the estimate of children age 0-17 in poverty from the Census Bureau's Small Area Income and Poverty Estimates. The state estimates of payments made under the general assistance medical programs are allocated to counties in proportion to Medicaid benefits.

Military medical insurance benefits - These benefits are vendor payments made under the TRICARE Management Program, formerly called the Civilian Health and Medical Plan of the Uniformed Services, for the medical care of dependents of active duty military personnel and of retired military personnel and their dependents at nonmilitary medical facilities. The state estimates are based on payments data from the Department of Defense. County data for these payments are unavailable. The state estimates are allocated to counties by military retirement payments data for September that are provided each year by the Department of Defense.

Income maintenance benefits

Supplemental Security Income (SSI) benefits - These benefits are received by the aged, the blind, and the disabled from both the federal and state governments. The state estimates are based on Social Security Administration (SSA) tabulations of annual disbursements for two categories of SSI benefits: Basic federal payments and supplemental state payments. The county estimates of the combined categories are based on payments data from the SSA.

Earned Income Tax Credits (EITC) - are federal income tax credits to low-income workers, mainly those with minor children. Eligibility for the tax credits is determined by the size of adjusted gross income, or earned income, and by certain household characteristics. Only a portion of this federal income tax credit is counted as a transfer receipt; this portion is the excess of the tax credit over the tax liability. The state estimates are based on data from the Internal Revenue Service's Historical Table 2 published in the *SOI Bulletin*. State estimates are allocated to counties based on the tabulations of these payments by ZIP code from the Internal Revenue Service. The IRS tabulations were converted to counties by BEA.

Supplemental Nutritional Assistance - These benefits, under the Supplemental Nutritional Assistance Program (SNAP) (formerly called food stamps), are issued to qualifying low-income individuals in order to supplement their ability to purchase food. Eligibility is determined by each state's interpretation of federal regulations; the U.S. Department of Agriculture (USDA) pays the cost of the benefits. The state estimates are based on tabulations of the value of the distributed benefits from the Department of Agriculture. The state estimates are allocated to counties based on payments data from the various state departments of social services. When payment data are not available, data on the number of SNAP recipients from Census Bureau's *Small Area Income and Poverty Estimates* program are used to extrapolate or interpolate.

Other income maintenance benefits - These benefits consist of family assistance, general assistance benefits, foster care and adoption assistance, child tax credits, Economic Stimulus Act of 2008 rebates, energy assistance, and the value of vouchers issued under the Special Supplemental Nutrition for Women, Infants and Children (WIC) program. Several temporary income tax credits area also included in other income maintenance benefits.

Family assistance **-** Formerly, this assistance was provided through the federally-aided, state-administered Aid to Families with Dependent Children (AFDC) and emergency assistance programs. In 1997 they were phased out and replaced by the Temporary Assistance to Needy Families (TANF) program. The state estimates are based on fiscal year direct data from the web site of the Administration for Children and Families (ACF) of the Department of Health and Human Services. The county estimates are based on payments data from the various state departments of social services. *General assistance benefits* - are the benefits received from state and local governments by low-income individuals and families who do not qualify for help under federally supported programs and disaster assistance received from the federal-state Other Needs Assistance program. The state estimates are based on payments data from the Census Bureau's annual *State and Local Government Finances* except for the disaster assistance portion which is based on direct data for each state and disaster from the Federal Emergency Management Agency (FEMA). The non-disaster portion of county estimates is based on payments data from the various state departments of social services. For counties in states where relevant payments data are not available, the state estimates are allocated in proportion to the estimate of people in poverty from the Census Bureau's *Small Area Income and Poverty Estimates*. The disaster portion of county estimates is based on data related to the specific disaster in related components when available or on household population of counties listed by FEMA as eligible for individual assistance for each disaster.

Foster care and adoption assistance - is received from state governments by families and institutions that care for foster children and by families that adopt children. The assistance is provided by state programs, some of which are federally aided. The state estimates are based on federal grants data from the Administration for Children and Families adjusted to reflect the fund matching percentage that is required of each state. The state estimates were allocated to counties in proportion to household population. *Child Tax Credits* - are federal income tax credits to people who have minor children. The portion of the credit that is counted as a transfer receipt is calculated as the excess of the tax credit over the tax liability. The state estimates are based on data from the Internal Revenue Service's Historical Table 2 published in the SOI Bulletin. In the absence of payments data for counties, the state estimates are allocated to counties in proportion to earned income tax credits.

Economic Stimulus Act of 2008 rebates **-** The Economic Stimulus Act of 2008 provided for income tax rebates to certain taxpayers and other individuals. The rebates for individuals with tax liabilities that exceed the rebate amount are treated as offsets to personal current taxes. Otherwise, the excess of the rebates over the tax liability is treated as a personal current transfer receipt. Because the eligibility criterion for nontax payers receiving these rebates was similar to that for Earned Income Tax Credit recipients, the distribution of the national estimate to states and counties is based on BEA estimates of the Earned Income Tax Credits.

American Recovery and Reinvestment Act of 2009 (ARRA) American Opportunity tax credit - This tax credit is a temporary modification of the Hope Credit for tax years 2009 and 2010. One modification was to make a portion of the credit be refundable. The portion of the credit that is counted as a transfer receipt is calculated as the excess of the tax credit over the tax liability. Because the eligibility criterion for nontax payers receiving this credit is similar to that for Earned Income Tax Credit recipients, the distribution of the national estimate to states and counties is based on BEA estimates of Earned Income Tax Credits.

ARRA Making Work Pay tax credit - This is a federal income tax credit of up to $400 for working individuals and $800 for married taxpayers filing joint returns. The portion of the credit that is counted as a transfer receipt is calculated as the excess of the tax credit over the tax liability. Because the eligibility criterion for nontax payers receiving this credit is similar to that for Earned Income Tax Credit recipients, the distribution of the national estimate to states and counties is based on BEA estimates of Earned Income Tax Credits.

ARRA Government Retiree tax credit - This is a one-time federal income tax credit of $250 available in 2009 for certain government retirees who receive a pension from work and are not covered by Social Security. This one-time credit is taken on the 2009 income tax return filed in 2010 and is a reduction to any Making Work Pay tax credit. Because the eligibility criterion for nontax payers receiving this credit is similar to that for Earned Income Tax Credit recipients, the distribution of the national estimate to states and counties is based on BEA estimates of Earned Income Tax Credits.

Adoption tax credit - This tax credit is for qualified expenses paid to adopt an eligible child. A temporary modification makes a portion of the credit be refundable in tax years 2010 and 2011. The portion of the credit that is counted as a transfer receipt is calculated as the excess of the tax credit over the tax liability. Because the eligibility criterion for nontax payers receiving this credit is similar to that for Earned Income Tax Credit recipients, the distribution of the national estimate to states and counties is based on BEA estimates of Earned Income Tax Credits.

Energy assistance - consists of both cash payments received by needy households and vendor payments made to suppliers to help defray the cost of home heating, cooling, and weatherization under the federally funded and state-administered energy assistance programs. The state estimates are based on payments data published by the Administration for Children and Families. The estimates for counties in most states are based on payments data from the various state departments of social services. For counties in states that do not provide these data, the state estimates are allocated to counties in proportion to unpublished Supplemental Security Income enrollment (number of recipients) from the Social Security Administration.

Special Supplemental Nutrition for Women, Infants and Children (WIC) benefits - This program is fully funded by the USDA Food and Nutrition Service and administered mainly through state agencies. The transfers under the program take the form of vouchers issued to low-income women who are pregnant or who have young children; the vouchers are used to purchase supplemental nutritious foods. The state estimates are based on direct data provided by the Food and Nutrition Service. State estimates were allocated to counties in proportion to BEA's estimates of family assistance.

Unemployment insurance compensation

State unemployment insurance compensation - These benefits consist mainly of the compensation received by individuals under state-administered unemployment insurance (UI) programs, but they include the special benefits authorized by federal legislation for periods of high unemployment. The provisions that govern the eligibility, timing, and amount of benefits vary among the states, but the provisions that govern coverage and financing are uniform nationally.

The state estimates are based on data from the U.S. Department of Labor, Employment and Training Administration. In about one third of the states, the state estimates are allocated to counties by payments data reported by the state employment security agencies. In the other states, state estimates are allocated to counties in proportion to the annual average number of unemployed persons from the Local Area Unemployment Statistics program of the Bureau of Labor Statistics (BLS).

Unemployment Compensation for Federal Employees (UCFE) - The UI program for civilian federal employees is a federal program administered by state employment security agencies acting as agents for the U.S. Government. The state estimates are based on data from the Employment and Training Administration. In about half of the states, the state estimates are allocated to the counties by county data or by local-district-office data using the same allocation procedure as that used for state unemployment insurance compensation. For the remaining states, the county allocators are residence-adjusted estimates of federal civilian wages and salaries.

Unemployment compensation for railroad employees - This compensation is received by railroad workers who are unemployed because of sickness or because work is unavailable. This UI program is administered by the Railroad Retirement Board (RRB) under a federal formula that is applicable throughout the Nation. The state and county estimates are based on payments data from the Census Bureau's quarterly FAADS.

Unemployment compensation for veterans (UCX) - This compensation is received by unemployed veterans who have recently separated from military service and who are not eligible for military retirement benefits. The state estimates are based on data from the Employment and Training Administration. For about half of the states, the state estimates are allocated to counties by county data or by local-district-office data from the state employment security agencies using the same allocation procedure as that used for state unemployment insurance compensation. For the remaining states, the county allocator is the population of veterans from the 1990 Census of population.

Other unemployment compensation - This compensation consists of Trade Adjustment Assistance and the benefits received from three defunct programs for the jobless: the Redwood Employee Protection program, the Public Service Employment program, and the Transitional Benefits program.

Trade adjustment assistance - This assistance is received by workers who are unemployed because of the adverse economic effects of international trade arrangements. The state estimates are based on calendar year data for these benefits that are tabulated by "petition" (location of plant) from the Department of Labor, which administers the program. The estimates are residence adjusted by BEA to approximate a geographic distribution based on the place of receipt of the benefits. A county distribution for 1986 from the Department of Labor is used to allocate the state control for all subsequent years.

Redwood Park benefits - These benefits were provided to workers made jobless by the expansion of the Redwood National Park in California during the period from May 31, 1977 to September 30, 1980. The benefits—which included weekly lay-off benefits, severance payments, and vacation replacement payments, as well as the continuation of health and welfare coverage, accrual of pension rights and credits, and retraining—generally extended to September 30, 1984 (although for any given beneficiary the benefits may have terminated earlier). Eighty-five percent of the state estimate provided by the Employment and Training Administration was allocated to Humboldt County and 15 percent was allocated to Del Norte County.

Public service employment benefits - These benefits were provided to unemployed public service workers who were ineligible for extended unemployment compensation under any other federal or state UI program. The program was authorized through 1979, but the extended into 1980. State employment security agencies made the payments and were reimbursed by the federal government. State estimates from the Employment and Training Administration were allocated to counties in proportion to state UI compensation.

Transitional benefits - These benefits were provided to jobless workers, newly eligible under the state UI program (agricultural workers, private household workers, and state and local government employees), during the first six months after the extended coverage became effective (January 1, 1978). State employment security agencies made the payments to the jobless workers and were reimbursed by the federal government. State estimates from the Employment and Training Administration were allocated to counties in proportion to state UI compensation.

Veterans' benefits

Veterans' pension and disability benefits - These benefits are received primarily by veterans with service-connected disabilities and by the survivors of military personnel who died of service-connected causes. In addition, these benefits are received by war veterans who are 65 years old or older, who have nonservice-connected disabilities, who are permanently and totally disabled, and who meet specified income requirements. The state and county estimates are based on the data for these benefits from the Department of Veterans Affairs (DVA).

Veterans' readjustment benefits - These benefits are allowances for tuition and other educational costs that are received by veterans and by the spouses and the children of disabled and deceased veterans; and payments for automobiles, conveyances, and specially adapted housing for disabled veterans. The state and county estimates are based on data for these benefits from the DVA.

Veterans' life insurance benefits - These are the claims received by beneficiaries and the dividends received by policyholders from the five veterans' life insurance programs administered by the DVA. The state and county estimates are based on data for these benefits from the DVA.

Other assistance to veterans - This consists of state and local government *assistance to indigent veterans* and state and local government payments of *veterans' bonuses*. The state estimates of state and local government assistance and bonuses are based on fiscal year data from the Census Bureau's annual *State Government Finances*. The state estimates are allocated to counties in proportion to the population of veterans obtained from the Department of Veterans Affairs.

Education and training assistance

Federal fellowship benefits - These benefits are received by recipients of federal fellowships but represent only a small portion of the total fellowship. These benefits are estimated in three subcomponents: The payments to outstanding science students who receive National Science Foundation (NSF) grants, the subsistence payments to the cadets at the six state maritime academies, and the payments for all other federal fellowships.

The state and county estimates of the payments to the recipients of NSF grants are based on annual NSF tabulations of the number of students receiving fellowships at each institution. The payment is assigned to the state and county in which the institution is located.

The state and county estimates of the subsistence payments to the cadets are based on payments data for each academy. The amount of the payment is assigned to the state and county in which each academy is located.

The national estimates of the payments to the recipients of all other federal fellowships are allocated to states and counties in proportion to household population.

Federal educational exchange benefits - These benefits are payments to the students who participate in the Fulbright scholarship program and in other international educational exchange programs. The national estimates are allocated to states and counties in proportion to household population.

Interest on guaranteed student loans – These interest payments are made by the Department of Education to commercial lending institutions on behalf of the individuals who receive low-interest, deferred-payment loans from these institutions in order to pay the expenses of higher education. The national estimates are allocated to states in proportion to the number of individuals enrolled in institutions of higher education located in those states from the Department of Education. The allocator for the county estimates is household population.

Higher education student assistance - This federal assistance consists of Pell Grants to students with low incomes for an undergraduate education and, beginning in 2006, Academic Competitiveness Grants and National SMART Grants to students eligible for Pell Grants. The state estimates are based on award year award data from the Department of Education (tabulated by the location of the institution) and county estimates are based on payments data from the Census Bureau's annual CFFR.

Job Corps benefits - These benefits are primarily the allowances for living expenses received by economically disadvantaged individuals who are between the ages of 16 and 21 and who are enrolled in the designated vocational and educational training programs. These benefits also include the adjustment allowances received by trainees upon the successful completion of their training. The state estimates are based on calendar year tabulations of the amount of allowances and allotments disbursed to the enrollees; the tabulations are from the Employment and Training Administration of the Department of Labor. The state estimates are allocated to counties in proportion to household population.

State educational assistance - These benefits consist of educational assistance provided by states to individuals for tuition and other educational expenses not including loans. The national and state estimates are based on data published by the Census Bureau's annual *State Government Finances*. The state estimates are allocated to counties in proportion to household population.

Other transfer receipts of individuals from governments

Compensation of survivors of public safety officers - These are payments to the survivors of state and local government employees, such as police officers and fire fighters, who are killed in the line of duty; the payments are made under a federal program. In 1988, the payment was $100,000. Since 1988, it has been $100,000 plus an allowance for the increase in consumer prices. The state estimates are based on fiscal year data from the Census Bureau's annual CFFR. The county allocator is the number of claims by county from the same tabulations.

Compensation of victims of crime - This compensation consists of payments to crime victims and to vendors on behalf of crime victims. The national estimates of total compensation are allocated to states in proportion to data provided by the Office of Victims of Crime of the Department of Justice. The state estimates are allocated to counties in proportion to household population.

Alaska Permanent Fund benefits - These benefits are the disbursements of property income to the residents of Alaska from the Alaska Permanent Fund. The fund, which is derived from oil revenue, pays a portion of its net property income to every resident. The state estimate is the amount that is paid and that is reported by the state. The state estimate is allocated to the boroughs and Census areas in proportion to household population.

Disaster relief benefits - These benefits are transient accommodations reimbursements to the victims of disasters, such as hurricanes and earthquakes, from the Federal Emergency Management Agency. The national estimates are allocated to states and counties in proportion to household population.

Radiation exposure compensation - These are payments made under the Radiation Exposure Compensation Act, which offers compensation to individuals exposed to radiation released during above-ground nuclear weapons tests and uranium mining. The state estimates are based on direct data from the Department of Justice. The state estimates are allocated to counties in proportion to household population.

Japanese interns redress benefits - These benefits, which were made from 1990 to 1997, are payments to the American citizens of Japanese descent who were interned during World War II. The state and county estimates are based on tabulations of these payments by ZIP code area from the Department of Justice. The ZIP code tabulations were converted to counties by BEA.

Anti-terrorism judgment receipts - These are payments from the U.S. Treasury to satisfy certain court judgments against countries found to have sponsored terrorism. The national estimates are allocated to states and counties in proportion to household population.

Compensation of victims of September 11 - These payments are from a voluntary, federally-funded program that provides compensation to eligible individuals or relatives of individuals who were killed or physically injured as a result of the terrorist-related aircraft crashes of September 11, 2001. National estimates are allocated to states and counties in proportion to an Associated Press list of confirmed dead.

Bureau of Indian Affairs benefits - These benefits are payments to American Indians for educational and social services that are not available to them from state or local agencies. The state estimates are based on data for these payments from the Bureau of Indian Affairs. The state estimates are allocated to counties in proportion to Census Bureau estimates of the "American Indian and Alaska Native Alone" population.

TV converter box coupons - These coupons, worth $40 each toward the purchase of up to two digital-to-analog converter boxes, were available upon request to all U.S. households. State and county estimates are based on a National Telecommunications and Information Administration report of number of coupons requested by state and 5-digit ZIP code.

American Recovery and Reinvestment Act of 2009 (ARRA) Federal additional compensation for unemployment - These receipts are an additional $25 weekly for beneficiaries of state and federal unemployment compensation. National estimates are allocated to states based on payment data reported to recovery.gov by the Labor Department's Employment and Training Administration. The state estimates are allocated to counties in proportion to the annual average number of unemployed persons from the Local Area Unemployment Statistics program of the Bureau of Labor Statistics (BLS).

ARRA COBRA premium reduction - This benefit for certain unemployed individuals is a 65 percent subsidy of the premium for health care insurance provided under the *Consolidated Omnibus Budget Reconciliation Act* (COBRA). National estimates are allocated to states in proportion to the number of unemployed persons covered by unemployment insurance programs as reported by Employment and Training Administration. The state estimates are allocated to counties in proportion to the annual average number of unemployed persons from the Local Area Unemployment Statistics program of the Bureau of Labor Statistics (BLS).

ARRA Economic Recovery lump sum - This benefit consists of a $250 lump sum provided to recipients of Social Security, Supplemental Security Income, Veterans' Pensions and Railroad Retirement benefits. National estimates for each type of beneficiary are allocated to states in proportion to the number of beneficiaries as reported by the administering agencies. The state estimates for Social Security, Supplemental Security Income and Railroad Retirement recipients are allocated to counties in proportion to the number of beneficiaries as reported by the administering agencies. The distribution of the state estimates for Veterans Recipients is based on the county estimates of Veterans' pension and disability benefits.

Alternative Minimum Tax (AMT) credit - This is a federal income tax credit for certain taxpayers with old unused AMT credit. The portion of the credit that is counted as a transfer receipt is calculated as the excess of the tax credit over the tax liability. The national estimates are allocated to states and counties in proportion to household population.

Home Affordable Mortgage principle reduction - This federal program, a response to the subprime mortgage crisis, helps eligible home owners with loan modifications on their home mortgage debt. In lieu of direct data on benefits, the national estimates are allocated to states and counties based on Federal Reserve Bank of New York data on the number of mortgage debtors, per debtor mortgage debt balance, and percent of mortgage debt in delinquency.

Temporary High Risk Health Insurance premium reduction - This benefit provides temporary coverage -- until broader coverage is provided under the Affordable Care Act -- to certain uninsured people with pre-existing medical conditions and without health insurance. It is provided as funding to cover the costs that exceed premiums collected for the high risk pool. In lieu of direct data on expenditures, the national estimates are allocated to states and counties in proportion to household population.

World Trade Center Health benefits - This benefit provides, under The James Zadroga 9/11 Health and Compensation act of 2010, monitoring and treatment to eligible responders and survivors of the 9/11 attacks. In lieu of direct data on expenditures, the national estimates are allocated to states in proportion to the enrollees by state data from the World Trade Center Health Registry. Because of lack of data on expenditures or participation by county and because of dispersion of participants since the attacks the state estimates are allocated to counties in proportion to household population.

Current Transfer Receipts of Nonprofit Institutions

These benefits consist of the payments made by federal, state, and local governments and by businesses to nonprofit organizations that serve individuals. These payments exclude federal government payments for work under research and development contracts.

Receipts from the federal government

The national estimates of receipts from the federal government are allocated to states and counties in proportion to household population.

Receipts from state and local governments

These receipts consist largely of Workforce Investment Act benefits received by private nonprofit institutions that provide job training under a work-study program funded by the federal government (formerly authorized by the Job Training Partnership Act). The national estimates are based on data from the *Monthly Treasury Statement*. The national estimates are allocated to the states and counties in proportion to household population.

Receipts from businesses

These transfer receipts are donations by corporate business to nonprofit institutions serving households. The national estimates are allocated to states and counties in proportion to household population.

Current Transfer Receipts of Individuals from Businesses

BP oil spill settlement receipts

These are receipts of individuals from BP (either directly or from a $20 billion escrow account) for losses from the oil spill in the Gulf of Mexico that began in April 2010. State estimates and county estimates are based on claims data from the Gulf Coast Claims Facility.

Other transfer receipts of individuals from businesses

These mostly consist of receipts from insurance companies (commercial automobile liability, medical malpractice, and net insurance settlements), corporate cash prizes, business losses due to fraud and unrecovered thefts, and receipts from personal injury trust funds. Net insurance settlements are actual insured losses (or claims payable) less a normal level of losses. The national estimates are allocated to states and counties in proportion to household population.

Contributions for Government Social Insurance

Contributions for government social insurance consist of employer contributions for government social insurance and employee and self-employed contributions for government social insurance (formerly called personal contributions for social insurance). It is deducted from earnings by place of work in the calculation of personal income.

Because most social insurance funds are trust funds with assets that cannot be used for purposes other than those specified by statute or trust agreement, payments to these funds are classified as contributions rather than taxes.

Employer Contributions for Government Social Insurance

These contributions are a component of supplements to wages and salaries. A complete description of these contributions and the methodology employed to estimate them are presented in the earlier Compensation section.

Employee and Self-employed Contributions for Government Social Insurance

Employee and self-employed contributions for government social insurance consist of payments by employees, by the self-employed, and by other individuals who participate in the following programs: Old-age, Survivors, and Disability Insurance (OASDI); Hospital Insurance (HI, or Medicare Part A); Supplementary Medical Insurance (Medicare Parts B and D); railroad retirement; state unemployment insurance (UI); temporary disability insurance; and veterans' life insurance.

Contributions of employees—like their payments of income taxes on wages and salaries—are withheld by their employers from their paychecks. These contributions include the payments that are sometimes made by employers on behalf of their employees (that is, the payments that are customarily made by the employee and that under special arrangement are made by the employer).

The self-employed make their contributions with their quarterly payments of estimated federal individual income taxes or annually with their federal income tax returns. County contributions data are not available for any of the programs; therefore, the state estimates of these contributions are allocated to counties by related data:

• State estimates of employee contributions to OASDI and HI for private employees excluding farm and railroad employees, federal civilian employees, active duty military, and state and local government employees are allocated to counties using the corresponding wages and salaries of those groups of employees.

• State estimates of self-employed contributions to OASDI and HI are allocated to counties using nonfarm proprietors' income.

• State estimates of contributions to railroad retirement are allocated to counties using wages and salaries of railroad employees.

• The 1991-2013 state estimates of contributions for Supplementary Medical Insurance (Medicare Parts B and D) are allocated to counties by tabulations of the number of persons (both the disabled and the aged) enrolled in the program from the Centers for Medicare and Medicaid Services (formerly the Health Care Financing Administration).

• State estimates of contributions for veterans' life insurance are allocated to counties using the 2006-2010 American Community Survey 5-year estimates of the veteran population, centered on 2008. This allocator is held constant for subsequent years. State estimates of contributions for veterans' life insurance for prior years are allocated to counties using the veteran population from the decennial Census of Population. Linear interpolation is used for other years.

• State estimates of employee contributions for State UI are allocated to counties in proportion to the civilian population 18 years and over from the Census of Population. The adult civilian population for 1991-1999 is an interpolation of the 1990 and 2000 populations; the adult civilian population for 2000 is held constant for subsequent years. Employees contribute to State UI only in Alabama (1969-70, 1975-1985), Alaska and New Jersey (1969-2013), and Pennsylvania (1984-88, 1992-1996, and 2003-2013).

• State estimates of contributions for temporary disability insurance are also allocated to counties in proportion to the civilian population 18 years and over. Employees contribute to this program only in California, New Jersey, and Rhode Island.

Residence Adjustment

Personal income is a measure of income by place of residence. The place of residence of individuals is the state and county in which they live. The place of residence of quasi-individuals is the state and county in which the individuals reside who benefit from the activities of the quasi-individuals or on whose behalf quasi-individuals receive income.

Accordingly, the residence of military personnel is the state and county in which they live while they are on military assignment, not their permanent or legal state of residence. The income of military personnel on foreign assignment is excluded from the state and local area personal income estimates because their residence is outside of the territorial limits of the United States.

The residence of seasonal migrant workers is the state and county in which they live while they are working, not their usual place of residence.

This definition of residence differs in some respects from that used by the Census Bureau, which provides data used in the preparation of the residence adjustment estimates and the population data that are used to calculate per capita personal income. For example, the residence of seasonal migrant workers is sometimes reported to the Census Bureau as their usual place of residence rather than the state in which they are living and working on April 1 when the decennial Census of Population is taken.

The source data for some components of personal income—personal current transfer receipts, dividends, interest, and rent, and proprietors' income—are recorded, or treated as if they were recorded, on a place-of-residence basis.

Most of the source data for the remaining three components of personal income (wages and salaries, supplements to wages and salaries, and contributions for government social insurance) are recorded on a place of work basis by the source agencies. Accordingly, the state and county estimates of these components reflect the earnings of people who work in each state and county. Therefore, a residence adjustment is calculated so that the state and county personal income estimates reflect the incomes earned by residents of each state and county.

The residence adjustment is prepared by first calculating a net residence adjustment for inter-county commuting flows and then adding the wage inflows and subtracting the wage outflows associated with border workers. Estimates of the residence adjustment by industry cannot be prepared because not all of the source data on which it is based are available by industry. State estimates of the residence adjustment are summations of the residence adjustments for all of the counties within the state.

Net Residence Adjustment for Intercounty Commuting Flows

The starting point for the net residence adjustment for intercounty commuting flows is journey-to-work (JTW) data from the Census Bureau. The JTW data are a tabulation of the wages and salaries of the employees in a given place-of-work county by their place of residence. The data are cross tabulated by industry. For a set of benchmark years, county-to-county wage outflow ratios by industry were calculated using the journey-to-work data. The wage outflow ratio is defined as the wages of workers who are employed in a given industry in a given county and live in a different county divided by the wages of all persons employed (resident and nonresident) in the given industry and county.

Earnings outflows are calculated by multiplying place-of-work income subject to adjustment by the wage outflow ratio. Income subject to adjustment is defined as wages and salaries plus employer contributions for employee pension and insurance funds less employee contributions for the following social insurance programs: Old-age, Survivors, and Disability Insurance, Hospital Insurance, Railroad Employee Retirement Insurance, state unemployment insurance and temporary disability insurance) and is calculated by county by industry from BEA annual estimates of those components of personal income. The outflows from a given workplace county, summed over all industries and all residence counties is the gross earnings outflow of that county.

Since the earnings outflow from one county is the earnings inflow of another county, the gross earnings inflows to a particular place of residence county are obtained by summing the earnings outflows of all industries to that county from all workplaces other than that county.

A provisional estimate of the net residence adjustment for inter-county commuting flows is the difference between the gross earnings inflows into that county and the gross earnings outflows from that county.

Modifying the provisional estimates

The provisional estimates for more than 1,800 counties which have high rates of inter-county commuting (mostly multicounty metropolitan areas) were modified for two reasons: (1) in numerous cases, the geographic coding by place of work of the American Community Survey data and that of the source data for BEA's wages and salaries were inconsistent; (2) to account for changes in commuting patterns since the benchmark year. Both adjustments were made in order to better align BEA's place-of-residence estimates with those from other sources such as the Internal Revenue Service.

The cluster adjustment first groups counties into clusters which were determined as follows: (1) counties that are part of a Combined Statistical Area; (2) counties that are part of a Metropolitan Statistical Area; (3) counties with flows from or to another county that are more than 25 percent of total wages. Second, for each county in a cluster the provisional estimate of the net residence adjustment was added to the place-of-work income subject to adjustment (ISA) to obtain a provisional estimate of place-of-residence ISA. Third, the provisional estimates of residence adjusted ISA for the counties in each cluster were summed to a total estimate for the cluster. Fourth, the total estimate for each cluster was redistributed to the counties of the cluster in proportion to the distribution of wages reported on Internal Revenue Service (IRS) Form 1040 (U.S. Individual Income Tax Return) to produce the modified estimates of residence adjusted ISA by county. The difference between the modified residence adjusted ISA and the place-of-work ISA is the net residence adjustment for intercounty commuting flows for cluster counties. For all other counties the net residence adjustment for intercounty commuting flows is the same as the provisional estimate.

For the 2001 and 2008 benchmark years, a ratio of the net residence adjustment for intercounty commuting flows to ISA was calculated for each county. The ratio was interpolated between benchmark years and multiplied by ISA to calculate the net residence adjustment for intercounty commuting flows for 2002 to 2007.

For 2009 and subsequent years, a provisional estimate of the net residence adjustment for inter-county commuting flows is calculated in the manner described above except that the wage outflow ratios for 2008 are used. The provisional estimate is also modified using current year IRS wage data in the manner described above. Since IRS wage data for 2016 are unavailable, data for 2015 were used in its place.

International Border Workers

The residence adjustment for the income earned by international border workers consists of two sets of estimates. The first set of estimates account for the inflows of the compensation earned by U.S. residents who commute to work in Canada and the outflows of the compensation earned by Canadian and Mexican residents who commute to work in the United States. The second set of estimates account for the inflows of compensation earned by U.S. residents employed by certain foreign organizations.

The national estimates of the inflows and outflows of the compensation of border workers are prepared in the context of the U.S. international transactions accounts. The county estimates of the inflows and the outflows of the compensation of border workers are allocations of the national control totals. The allocated inflows are added to, and the allocated outflows are subtracted from, the estimates of the net residence adjustment for intercounty commuting flows to obtain the final residence adjustment estimates for counties.

Inflows from and outflows to Canada and Mexico

The national estimates of the inflows of the compensation earned by U.S. residents who commute to work in Canada or Mexico are allocated to U.S counties on the basis of journey-to-work (JTW) employment data from the Census Bureau. The JTW employment data are a tabulation of the workers residing in a given county by their place of work. The subset of workers with a job in Canada or Mexico is used for the residence adjustment of border workers. The number of county residents with a job in Canada (or Mexico) is multiplied by the ratio of the BEA estimate of private place-of-work wages and salaries to the BEA estimate of private place-of-work wage and salary employment (the average private-sector annual wage) for that county. The result is used to allocate the national estimate of the inflows of compensation from Canada (or Mexico) to U.S. counties.

Since there is no information on the commuting flows of Canadian and Mexican residents to the United States, the national estimates of the outflows of the compensation earned by residents of Mexico and Canada who commute to work in the United States are allocated to counties in the same proportion as compensation inflows from Canada and Mexico.

U.S. residents employed by certain foreign organizations

A national estimate of compensation earned by US residents employed by international organizations such as the United Nations, the International Monetary Fund, and the World Bank, and by foreign embassies and consulates located within the geographic borders of the United States is prepared by BEA as part of the international transactions accounts.

Foreign embassies and consulates in the United States are considered to be part of the territory of the countries they represent. U.S. residents working for foreign embassies and consulates in the United States are therefore international border workers, that is, persons who live in one country and work in another. The offices of international organizations are treated in a similar fashion, that is, they are treated as if they were located on foreign territory. Therefore the compensation paid to US residents by these embassies, consulates, and international organizations represent inflows to the US.

The national estimate of wage inflows from these foreign organizations is first allocated to twelve very large counties and the District of Columbia in proportion to estimates (from 1968) of the administrative expenditures of these organizations. The administrative expenses series was prepared by BEA. This yields a set of place of work estimates. Next, the place-of-work estimates are adjusted for the place of residence of the workers. The place-of-work estimates are multiplied by county to county wage outflow ratios (discussed above in the Intercounty Commuting Flows section) to estimate gross wage outflows (and inflows). County estimates of wage inflows from foreign organizations by place of residence are the sum of the place of work estimates and the estimates of the gross wage inflows less the gross wage outflows.

Employment

BEA's estimates of state and local area employment consist of the number of wage and salary jobs, sole proprietorships, and general partners. The county employment estimates are a complement to the place-of-work earnings estimates. Earnings is estimated on a place-of-work basis, by North American Industry Classification System (NAICS) three-digit subsector beginning in 2001, and net earnings (net of contributions for government social insurance) is estimated on a place-of-residence basis for the sum of all industries. The employment estimates are designed to conform conceptually and statistically with the place-of-work earnings estimates; the same source data—generally from administrative records—are used for both the earnings and employment estimates whenever possible. The earnings estimates reflect the scale and industrial structure of an area's economy rather than the income of the area's residents. Therefore, the employment estimates measure the number of jobs in a county, instead of the number of workers who perform the jobs. The characteristics of the county employment estimates follow from this concept and from the characteristics and limitations of the available source data.

Employment estimates measure the number of jobs

Employment can be measured either as a count of workers or as a count of jobs. In the former case, an employed worker is counted only once; in the latter case, all jobs held by the worker are counted. The county employment estimates are a count of the number of jobs, so that, as with the earnings estimates, a worker's activity in each industry and location of employment is reflected in the measure.

Treatment of part-time jobs

County employment is estimated on a full-time and part-time basis because of the limitations of the available source data. County-level data that separate part-time jobs and wages from full-time jobs and wages, which are needed to prepare full-time equivalent measures, are not available. An average earnings measure can be calculated from the BEA county employment and earnings estimates. Average earnings reflect the extent of part-time employment in the given area and industry, as well as more basic factors such as hourly wage rates.

Geography

County employment estimates, like wage and salary estimates, are measured by place-of-work—the job location—instead of by place of residence—where the worker lives. Thus the estimates are more representative of the county's industrial base than of the activities of the residents of the county. For nonfarm sole proprietors' employment, the only available annual data are classified by tax filing address, which is usually the filer's residence. BEA assumes that place-of-work and place-of-residence are identical for nonfarm sole proprietors. Since most farm operators live on or near their land, place of work and place of residence are also identical for farm proprietors.

Temporal dimension

The estimates of wage and salary employment are annual averages of twelve monthly observations for the year. This gives a job which lasts only part of the year a lesser weight that a year-round job. In contrast, the estimates of nonfarm proprietors' employment are counts of the number of proprietors active during any portion of the year. This is because the available source data do not indicate the portion of the year that the businesses are in operation.

Wage and Salary Employment

Wage and salary employment is a measure of the average annual number of full-time and part-time jobs in each area by place of work. All jobs for which wages and salaries are paid are counted. Although compensation paid to jurors, expert legal witnesses, prisoners, and justices of the peace (for marriage fees), is counted in wages and salaries, these activities are not counted as jobs in wage and salary employment. Corporate directorships are counted as self-employment.

The following description of the sources and methods used in estimating wage and salary employment is divided into two sections: Employment in industries covered by unemployment insurance (UI) programs, and employment in industries not covered by UI.

Employment in industries fully covered by the UI programs

The estimates of about 94.5 percent of wage and salary employment are derived from tabulations of 2016 quarterly unemployment insurance (UI) contribution reports (Form ES-202) filed with state employment security agencies. Employers subject to UI laws usually submit reports for each operating establishment, classified by county and industry. However, in some cases, an employer may group very small establishments into a single "statewide" report without county designation. Each quarter, the state employment security agencies submit the tabulations to the Bureau of Labor Statistics (BLS), which provides the data to BEA. The tabulated data (called the Quarterly Census of Employment and Wages, QCEW) consist of monthly employment and quarterly wages by county by NAICS six-digit detail (beginning in 2001).

BEA adds several million administrative records received from the states and the District of Columbia to its database annually. The records are checked for major errors by several computerized edit routines. One edit routine analyzes the current quarter county data for invalid industry codes, duplicate records, and records that contain no data. Another edit routine calculates expected county-level average employment and average wages on a quarterly basis, based on percentage changes for that quarter in the previous two years. If the difference between the actual numbers and the estimated numbers exceeds established limits, the record is identified for further review. Anomalies that remain unreconciled after reviewing comments and other supporting data are referred back to BLS for further investigation.

The basic procedure for preparing the local area estimates of wage and salary employment for each UI-covered industry is to average the 12 monthly QCEW employment observations and to allocate the higher level geographic total in proportion to the averaged series. However, QCEW employment does not precisely meet the statistical and conceptual requirements for BEA's employment estimates. Consequently, the data must be adjusted to meet the requirements more closely. The necessary adjustments affect both the industrial and geographic patterns of county employment.

Adjustment for industry non-classification - The industry detail of the QCEW tabulations regularly shows minor amounts of employment that have not been assigned to an industry. The industrial classification scheme used by BEA for its estimates does not allow for a not-elsewhere-classified category. Therefore, for each county, the amount of QCEW employment in this category is distributed among the covered industries in proportion to the industry-classified employment. The amounts involved in this adjustment are quite small—about 0.2 percent of total employment nationally. No error is introduced into the total employment estimate for a county because the adjustment involves only an apportionment within the county of the amount reported for that county.

Misreporting adjustment - An adjustment is made to the QCEW data for misreporting of private sector employment. In 2016, misreported employment accounted for 0.6 percent of BEA wage and salary employment. The national estimate of misreported employment for each industry is made in two parts: One for the underreporting of employment on UI contribution returns filed by employers and one for the employment of employers that fail to file UI contribution returns. The data necessary to replicate this methodology below the national level are not available. Instead, the national adjustment for each industry is allocated to the counties in proportion to QCEW employment.

Adjustment for statewide reporting - Employment reported for statewide units is allocated to counties in proportion to the distribution of the employment reported by each county.

Geographic adjustments for government employment -In several cases, BEA has determined that the QCEW reports attribute government employment to the wrong states or counties; the best available information is used to remedy these deficiencies. Examples of how BEA adjusts the government employment are as follows:

• The QCEW tabulations of federal civilian employment assign all of the employment of the U.S. Congress and its staff to the District of Columbia, although members of Congress employ some of their staff in home district offices. BEA assumes that this home district employment accounts for 25 percent of total congressional employment and reassigns that portion of the total to the states in proportion to their congressional representation. No explicit adjustment is made at the county level; in effect, the home district employment is allocated to counties in proportion to QCEW federal employment.

• For the federal sector, detailed civilian employment data available from the Office of Personnel Management (OPM) is used to evaluate the county coding of the corresponding QCEW data and remedy the deficiencies. Prior to 2002, for New York, BEA allocated the QCEW state employment totals for the Postal Service to counties in proportion to the OPM series for that agency.

• For the non-education component of state government, a comparison of the QCEW data with comparable data from the Census of Population indicated that an excessively large proportion of the QCEW employment was reported in the county of the state capital for six states. For these states—Illinois, Michigan, New Jersey, Rhode Island, Tennessee, and Wisconsin—the state totals of state government non-education employment are allocated to counties in proportion to an unpublished tabulation of the place-of-work segment of the journey-to-work (JTW) decennial Census employment data for 1970, 1980, 1990, with 1990 carried forward to 2000 and all intermediate years interpolated. More recently, a five year employment compilation of the annual American Community Survey (ACS) JTW employment data are used in the preparation of the county estimates of employment, with 2001-2007 interpolated between the two JTW distributions.

Employment in industries not fully covered by the state UI programs

Farms - This industry is only partially covered. Farm employees have mandatory UI coverage or almost complete voluntary coverage in the following states: Arizona, California, Connecticut, Delaware, Florida, Hawaii, Massachusetts, New Jersey, Rhode Island, and Washington. Therefore, county estimates of hired farm employment for these states are derived from QCEW data. For the remaining states, the county estimates of hired farm employment are based on the geographic distribution of the number of hired farm workers who worked 150 days or more reported in Census of Agriculture.

Farm labor contractors - This industry is classified in support activities for agriculture and forestry rather than in farms. The UI coverage in Arizona and California is complete enough to permit the use of the QCEW data for both the state and county estimates, but most state UI programs only partially cover this industry. For these states, the county estimates of farm labor contractor employment are based on the geographic distribution of expenditures for contract labor reported in the Census of Agriculture.

Railroads - The railroad industry is covered by its own unemployment insurance program, which is administered by the Railroad Retirement Board (RRB), rather than by the state UI system. Data suitable for estimating local area employment of railroads are available from the RRB only on a place-of-residence basis. Because BEA's employment estimates are designed to conform conceptually and statistically to the place-of-work earnings estimates, the RRB data are adjusted to a place-of-work basis by using journey-to-work data from the 2000 Census of Population. The national totals for all railroad companies combined are allocated to counties in proportion to the adjusted RRB series.

Private elementary and secondary schools - Private elementary and secondary schools are treated as a non-covered industry because religiously affiliated elementary and secondary schools, which account for most of the employment in this industry, remain largely outside the scope of the UI program. The state estimates of private elementary and secondary school employment are primarily based on the employment reported annually by the Census Bureau's *County Business Patterns* (CBP). The CBP data are tabulated from the administrative records of the social security program—Old-Age, Survivors, Disability, and Hospital Insurance—and are more complete for elementary and secondary schools than the data prepared under the UI program. The social security program, although exempting nonprofit religious organizations—including schools—from mandatory coverage, has elective coverage provisions that have resulted in broad participation among religiously affiliated elementary and secondary schools.

In about half of the states, the UI coverage of elementary and secondary schools is complete enough to permit the use of QCEW data as the basis for the county employment estimates. For the other states, the county estimates are based on the best available series of private elementary and secondary school employment chosen from data published by state departments of education, data from the U.S. Department of Education's survey of private elementary and secondary schools, or data from CBP, which cannot be used more generally because they are frequently suppressed at the county level to prevent disclosures.

Religious organizations - The Federal Unemployment Tax Act permits states to exclude religious organizations from mandatory UI coverage. Although most state UI laws do have some provisions for elective coverage, about 11 percent of the national total employment of religious organizations are covered. Therefore, the county estimates of the employment of religious organizations are based on CBP data. The CBP data are adjusted proportionately to sum to the BEA national employment totals for this industry.

Private households - For this largely non-covered industry—mainly domestic servants—the national employment estimates are allocated to counties in proportion to place-of-work private household employment from the Census of Population journey-to-work data.

Military - County military employment is measured as the number of military personnel assigned to active duty units that are stationed in the county plus the number of military reserve unit members. The estimates of active duty employment for the Army, Air Force, Navy, Marine Corps, and Coast Guard are based on the annual averages of 12 monthly observations, for a given year, from reports received from each branch of service. Navy personnel assigned to ships and other mobile units and Marines assigned to Fleet Marine Force units are measured according to the units' home ports rather than their actual locations as of the reporting date.

The measure of employment of the military Reserves—including the National Guard—is confined to members of reserve units that meet regularly for training. The state estimates are based on fiscal year—ending September 30—tabulations of military reserve strength provided by the Department of Defense. For consistency with the BEA estimates of military reserve wages, the state totals of military reserve employment are allocated to counties in proportion to civilian population.

Adjustments for noncovered segments of UI-covered industries - BEA makes adjustments to add the employment of several non-covered segments. If relevant source data are not available, the national adjustments are allocated to states in proportion to the QCEW employment of the affected industry or industries. In all cases, the state adjustments are allocated to counties in proportion to QCEW employment. Examples of BEA adjustments for non-covered segments of UI-covered industries are as follows:

• Some insurance solicitors and real estate agents are omitted from UI coverage because they are paid solely by commissions. The national estimates for these two segments are allocated to states in proportion to QCEW employment in each industry.

• Establishments of railroad carrier affiliates and railway labor organizations are covered by the Railroad Unemployment Insurance system rather than by state UI. The state adjustments are based on data provided by the Railroad Retirement Board.

• Corporate officers in Washington State are omitted from UI coverage. The Washington Employment Security Department provides BEA with estimates of the number of corporate officers by NAICS six digit by county.

• Some nonprofit organizations are exempt from UI coverage because they have fewer than four employees. The national estimates are allocated to states in proportion to the QCEW employment of each industry.

• Students and the spouses of students who are employed by the institutions of higher education in which the students are enrolled are generally omitted from UI coverage. State estimates of the non-covered student employment of private, state government, and local government institutions are based on the differences between the relevant QCEW employment data and alternative employment data that include student employment. The alternative data are reported annually by the Census

Bureau in *County Business Patterns* for the private institutions and on the Census Bureau's *Annual Survey of Government Employment*.

• UI coverage of state and local government employees excludes elected officials, members of the judiciary, and hospital interns. The national estimates are allocated to states in proportion to QCEW state and local government employment.

Alternative measures of wage and salary employment

Current Employment Statistics - The Bureau of Labor Statistics (BLS)—in cooperation with state employment security agencies—prepares the Current Employment Statistics (CES)—a set of state and local area wage and salary employment estimates—that is similar to the BEA estimates. Both are job-count measures of full-time and part-time employment on a place-of-work basis. The CES estimates are based on a monthly sample survey—using Form BLS-790—of nonagricultural establishments with employees. The sample for UI-covered industries is drawn from all establishments reported in employers' UI contributions returns, and the monthly sample-based series for covered industries is benchmarked annually to QCEW employment; thus both the BEA and the CES series are grounded on the same set of administrative records data. A detailed description of the sampling and estimating methodologies for the CES estimates is presented in the "Explanatory Notes" of BLS's monthly *Employment and Earnings*.

The CES estimates are timelier than the BEA estimates; preliminary BLS estimates are released with a one-month lag. By contrast, the BEA estimates are prepared only as annual averages and are released at the state level nine months after the reference year. At the county level, the estimates by industry are released 11 months after the reference year.

The BEA series is somewhat broader in its coverage than the CES series. The BEA series includes industries—agriculture, forestry, fishing, and hunting; private households; and the military—that CES excludes. A misreporting adjustment is unique to the BEA series. However, the CES series includes, within the scope of its coverage, all the non-covered segments of UI-covered industries for which BEA makes explicit adjustments.

The BEA estimates of wage and salary employment are accompanied by a self-employment series that is consistent with the wage and salary employment series as much as the available source data allow. No self-employment series is available in conjunction with the CES employment estimates.

At the national and state levels, the BEA estimates of wage and salary employment are available at the NAICS three-digit subsector beginning with 1998. By contrast, the CES estimates for the nation (in *Employment and Earnings*) are available in more detail: At the state level the CES estimates are presented only at the NAICS sector or SIC division ("one-digit") level; however, more detailed estimates are available from some of the state employment security agencies. At the county level, the BEA estimates of wage and salary employment are available at the all-industry level, and at the NAICS sector level, when combined with BEA's self-employment estimates. The CES local area estimates are available at the NAICS sector or SIC division level.

The BEA estimates are available for almost all counties, and for all county-based metropolitan areas as defined for federal statistical purposes. The local area CES estimates presented in *Employment and Earnings* are for the larger metropolitan areas only, but estimates for smaller metropolitan areas and for counties are available from some of the state employment security agencies. BLS uses the alternative city-and-town definitions of the metropolitan areas in the New England states, while BEA uses the standard county-based metropolitan area definitions.

County Business Patterns - Another measure of county employment by place of work is the employment data published in the Census Bureau's *County Business Patterns* (CBP). It differs in source data and coverage from BEA's employment and QCEW employment.

The CBP data are derived from Census Bureau business establishment surveys and federal administrative records.

The coverage of the CBP data differs from that of the QCEW data primarily because the CBP data exclude most government employees, while the QCEW data cover civilian government employees. CBP data also exclude several private industries covered at least in part by the QCEW: crop and animal production; rail transportation; insurance and employee benefit funds; trusts, estates, and agency accounts; and private households. However, the CBP data cover the employees of educational institutions, membership organizations, and small nonprofit organizations in other industries more completely than the QCEW data. In addition, the CBP data reports employment for the month of March only; the QCEW employment data are quarterly and annual averages of monthly data. Beginning in 2001, QCEW classifies employees of Indian tribal governments and enterprises in local government. These employees were previously classified in the relevant private industries. In the CBP data, these employees are still classified in private industries.

Nonfarm Self-Employment

The BEA local area estimates of nonfarm self-employment consist of the number of sole proprietorships and the number of individual general partners. The nonfarm self-employment estimates resemble the wage and salary employment estimates in that both measure jobs—as opposed to workers—on a full-time and part-time basis. However, because of limitations in source data, two important measurement differences exist between the two sets of estimates. First, the self-employment estimates are largely on a place-of-residence basis rather than on the preferred place-of-work basis. Second, the self-employment estimates reflect the total number of sole proprietorships or partners active at any time during the year—as opposed to the annual average measure used for wage and salary employment.

National totals

For each NAICS three-digit subsector, the national total of nonfarm self-employment equals the sum of the number of sole proprietorships and the number of individual general partners.

Sole proprietorships - Income from a nonfarm sole proprietorship is reported on Schedule C—*Profit, or Loss, from Business or Profession*—of Internal Revenue Service (IRS) Form 1040—*U.S. Individual Income Tax Return.* A schedule is filed for each business operated by the filer and the industry of the proprietorship reported. In addition, corporate directors—who are not officers in the corporation—use Schedule C to report their director's fees. BEA uses the number of Schedule Cs filed (including those filed by corporate directors) as its measure of the number of sole proprietorships. The national estimate of the number of nonfarm sole proprietorships in each NAICS three-digit subsector is based on a sample of these schedules. In the absence of IRS data for the most recent years, the number of proprietorships is extrapolated forward using prior years' growth rates.

Partners - A preliminary national estimate of the number of nonfarm partners by NAICS three-digit subsector is based on a sample of returns of IRS Form 1065—*U.S. Partnership Return of Income*. One Form 1065 is filed by each business partnership. The number of partners which can include corporations and other legal entities as well as individuals) and the industry of the business are indicated on the form.

The preliminary estimate of the number of partners by industry is adjusted by using relationships from two special tabulations of partnership tax data provided by the IRS. The first tabulation, available annually, is of the number of limited partners—generally at the NAICS sector level. The second tabulation, available for 1986 only, is the number of partners by SIC division by type (e.g. individuals, corporations, other partnerships acting as partners, and fiduciaries) in partnerships with 10 or fewer partners.

The adjustment of the preliminary estimate is at the NAICS sector level. The preliminary estimates of the number of partners are summed to the appropriate industry totals. The number of limited partners from the first IRS special tabulation is subtracted from the preliminary estimate to obtain the number of general partners. Next, the ratio of the number of individual partners to the total number of partners is calculated for each industry from the second IRS special tabulation. This ratio is multiplied by the number of general partners in the industry in each year to yield the number of individual general partners. Finally, the NAICS sector totals of the number of individual general partners are allocated to the three-digit subsectors in proportion to the number of partnerships to yield the final estimate of partners.

In the absence of IRS data for the most recent years, the number of partners is extrapolated forward using prior years' growth rates.

State and county estimates

Preliminary state and county estimates of self-employment are also based on tabulations of the number of nonfarm sole proprietorships filing IRS Schedule C, Form 1040 and on the number of nonfarm general partners as reported on IRS Schedule B, Form 1065. However, the entire population of returns is used (rather than just the sample used for the national estimates) and slightly different data from the forms are available for states and counties. Specifically, data are available on the number of partners in each partnership and the type of partnership. Up to four partners in each partnership are counted except limited partnerships which are assumed to have a single general partner. Tabulations are prepared by NAICS three-digit subsector. The national estimates of sole proprietorships and partners are combined to form an estimate of total self-employment and allocated to states in proportion to the preliminary state estimate of total self-employment. In the absence of IRS data for the most recent years, the state allocators for prior years are used.

At the county level, tabulations of Schedule C and Form 1065 are available at the NAICS sector level only. Therefore state estimates are summed to the NAICS sector level for use as control totals for the county estimates. The controls are then allocated to the counties in proportion to preliminary estimates of county self-employment. In the absence of IRS data for the most recent years, the county allocators for prior years are used.

Farm Self-Employment

Farm self-employment is defined as the number of non-corporate farm operators, consisting of sole proprietors and partners. In 1974, the U.S. Department of Agriculture (USDA) set the definition of a farm as an establishment that produces, or normally would be expected to produce, at least $1,000 worth of farm products—crops and livestock—in a typical year. Starting in 2002, BEA adjusts this $1,000 threshold for inflation to be more consistent with how we estimate non-farm self employment. Because of the low cutoff point for this definition even when adjusted for inflation, the farm self-employment estimates are effectively on a full-time and part-time basis. The estimates are consistent with the job-count basis of the estimates of wage and salary employment because farm proprietors are counted without regard to any other employment. The distinction between place-of-work and place-of-residence is not significant because most farm operators live on or near their land. Similarly, because of the annual production cycle of most farming, the distinctions between the point-in-time, the average annual, and the any-activity temporal concepts of employment measurement are not significant.

National and State Estimates (1969-2001)

Both the national and state estimates of farm self-employment are prepared by the application of a series of ratios to the annual estimates of the number of all farms prepared by the National Agricultural Statistics Service (NASS), U.S. Department of Agriculture (USDA). For the BEA national estimates, the ratios are drawn from the USDA's annual Agricultural Resource Management Study (ARMS), previously the Farm Costs and Returns Survey (FCRS); for the state estimates, the ratios are drawn from the quinquennial Census of Agriculture. The census ratios are interpolated between census years, and the ratios from the last census are used for each subsequent year. The sequence of estimating steps for the national totals and the preliminary state estimates is as follows:

1. The number of non-corporate farms is derived as the product of the NASS number of all farms and the ratio of the number of non-corporate farms to all farms.

2. The number of sole-proprietor farms is derived as the product of the number of non-corporate farms (step 1) and the ratio of the number of sole-proprietor farms to non-corporate farms.

3. The number of partnership farms is derived as the product of the number of non-corporate farms (step 1) and the ratio of the number of partnership farms to non-corporate farms.

4. The number of farm partners is derived as the product of the number of partnership farms (step 3) and the ratio of the number of farm partners to partnership farms.

5. Total farm self-employment (final for the nation; provisional for the states) is derived as the sum of the number of sole-proprietor farms (step 2) and the number of farm partners (step 4). Finally, the national totals are allocated to states in proportion to the provisional state estimates (the allocators developed in step 5).

National and State Estimates (2002 forward)

Beginning in 2002, the Census of Agriculture started publishing the number of farm operators by legal form of organization for all states. The methodology for estimating farm self- employment from 2002 onward therefore includes additional steps in which the ratio of the number of farm operators to the number of farms are applied. In addition, BEA now adjusts the production threshold an operation must meet to qualify as a farm for inflation using the prices received index for all items for all farms from NASS. The new sequence of steps for estimating farm self- employment are as follows:

1. The number of non-corporate farms is derived as the product of the NASS number of all farms and the ARMS ratio of the number of non-corporate farms to all farms.
2. The number of sole-proprietor farms is derived as the product of the number of non-corporate farms (step 1) and the ARMS ratio of the number of soleproprietor farms to non-corporate farms.
3. The adjusted number of sole-proprietor farms is derived as the product of the number of sole-proprietor farms (step 2) and the ratio of the number of soleproprietor farms over the inflation-adjusted threshold to all sole-proprietor farms.
4. The number of sole-proprietor farms is further adjusted to remove farms with hired managers. It is derived as the product of the adjusted number of soleproprietors farms (step 3) and the ratio of sole-proprietor farms without hired managers to total sole-proprietor farms.
5. The number of sole-proprietors is derived as the product of the adjusted number of sole-proprietor farms (step 4) and the ratio of the number of operators to sole-proprietor farms.
6. The number of partnership farms is derived as the product of the number of non-corporate farms (step 1) and the ARMS ratio of the number of partnership farms to non-corporate farms.
7. The adjusted number of partnership farms is derived as the product of the number of partnership farms (step 6) and the ARMS ratio of the number of the number of partnership farms over the inflation-adjusted threshold to all partnership farms.
8. The number of partnership farms is further adjusted to remove farms with hired managers. It is derived as the product of the adjusted number of partnership farms (step 7) and the ratio of partnership farms without hired managers to total partnership farms.
9. The number of farm partners is derived as the product of the adjusted number of partnership farms (step 8) and the ratio of the number of farm partners to partnership farms.

10. Total farm self-employment (final for the nation; provisional for the states) is derived as the sum of the number of sole-proprietors (step 5) and the number of farm partners (step 9).
11. Finally, the national totals are allocated to states in proportion to the provisional state estimates (step 10).

County Estimates

State estimates of the number of operators in sole-proprietor farms are allocated to counties on the basis of the number of sole proprietor farms and state estimates of the number of farm partners are allocated to counties on the basis of the number of partnership farms.

Population

BEA uses the Census Bureau's midyear population estimates (number of individuals (both civilian and military) who reside in an area as of July 1).

Disclosure-Avoidance Procedures

Like other statistical agencies, the Bureau of Economic Analysis (BEA) is legally required to safeguard the confidentiality of the information that 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, states, and local areas only at the North American Industry Classification System (NAICS) subsector level or Standard Industrial Classification (SIC) two-digit level, even though it receives source data at the NAICS four- and five-digit industry levels or SIC three- and four-digit levels.

Most of the data that BEA receives from other agencies are not confidential. The agencies summarize their data by program, ZIP code, county, or state, so that 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.

However, the Quarterly Census of Employment and Wages (QCEW, formerly known as ES-202 data) tabulations that BEA receives from the 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.

To prevent either the direct or the indirect disclosure of the confidential information, BEA uses the BLS state, county, and metropolitan statistical area 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 or SIC two-digit 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. In order 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.

BEA's estimates for micropolitan and metropolitan statistical areas, metropolitan divisions, combined statistical areas, and the metropolitan and nonmetropolitan portions of states are aggregations of its county estimates. It often happens that an area consists of two or more counties with a relatively small amount of suppressed income in a particular industry relative to the aggregate for all counties in the area. When the suppressed amount is below a certain percentage threshold, BEA publishes the portion of the aggregate which is disclosable and flags it with a code (E) indicating that the published amount constitutes the major portion of the aggregate for the area. For a given area, the number of counties that are aggregated in an (E) estimate can vary from industry to industry and from year to year.

CBP

An additional source of employment and wage data is County Business Patterns (CBP), which provides annual statistics for businesses with paid employees within the U.S., Puerto Rico, and Island Areas (Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and the U.S. Virgin Islands) at a detailed geography and industry level. Statistics are available on business establishments at the U.S. level and by State, County, Metropolitan area, ZIP code, and Congressional District. Data for Puerto Rico and the Island Areas are available at the State and county equivalent levels. CBP covers most NAICS industries excluding crop and animal production; rail transportation; National Postal Service; pension, health, welfare, and vacation funds; trusts, estates, and agency accounts; private households; and public administration. CBP also excludes most establishments reporting government employees. Data for establishments are presented by geographic area, 6-digit NAICS industry, legal form of organization (U.S. and state only), and employment size class. Information is available on the number of establishments, employment during the week of March 12, first quarter payroll, and annual payroll. Precautions are taken to avoid disclosing the operations of an individual employer. This data is available at a very detailed level, and while it has many suppressions due to confidentiality requirements, its advantage is that when the data is suppressed, ranges for the establishments are supplied. This provides some basis from which to make a rough estimate of employees in that industry in the absence of any other information.

Establishments

An establishment is a single physical location at which business is conducted or services or industrial operations are performed. It is not necessarily identical with a company or enterprise, which may consist of one or more establishments. When two or more activities are carried on at a single location under a single ownership, all activities generally are grouped together as a single establishment. The entire establishment is classified on the basis of its major activity and all data are included in that classification.

Establishment counts represent the number of locations with paid employees any time during the year. This series excludes government establishments except for wholesale liquor establishments

(NAICS 4248), retail liquor stores (NAICS 44531), Federally-chartered savings institutions (NAICS 522120), Federally-chartered credit unions (NAICS 522130), and hospitals (NAICS 622).

Payroll

Payroll includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, bonuses, vacation allowances, sick-leave pay, and employee contributions to qualified pension plans paid during the year to all employees. For corporations, payroll includes amounts paid to officers and executives; for unincorporated businesses, it does not include profit or other compensation of proprietors or partners. Payroll is reported before deductions for social security, income tax, insurance, union dues, etc. This definition of payroll is the same as that used by the Internal Revenue Service (IRS) on Form 941 as taxable Medicare Wages and Tips (even if not subject to income or FICA tax). First-quarter payroll consists of payroll during the January-to-March quarter.

Mid-March Employment

Paid employment consists of full- and part-time employees, including salaried officers and executives of corporations, who are on the payroll in the pay period including March 12. Included are employees on paid sick leave, holidays, and vacations; not included are sole proprietors and partners of unincorporated businesses.

Data Withheld from Publication

In accordance with U.S. Code, Title 13, Section 9, no data are published that would disclose the operations of an individual employer. The number of establishments in an industry classification and the distribution of these establishments by employment-size class are not considered to be disclosures, so this information may be released even though other information is withheld from publication.

Estimation of Summary-Level Data Suppressions in Major Regions and States

There are four major data sets from the BEA State Personal Income (SPI) series that need to be unsuppressed: (1) SA05 – Personal income and detailed earnings by industry; (2) SA06 – Compensation by industry; (3) SA07 – Wages and salaries by industry; and (4) SA25 – Employment by industry. These data cover the U.S., 50 states, District of Columbia, and eight Major Regions. The NAICS-based industry data begins in 1998. We also use the BEA SA27 – Wage and salary employment by industry series to aid in estimating Employment.

The current solving methodology is to use iterative proportional fitting after generating estimates based on the best available information. In order to begin this process, we obtain minimums and maximums for each suppressed value. The minimum and maximum values are calculated based on all available data (i.e. industries add up to a known total, counties add up to a known state, states add up to a known major region, major regions add up to a known nation). The BEA suppression codes are also used in these calculations when a minimum or maximum value can be derived from the code used.

Estimates for missing state level data are then generated using the best of several available estimation methodologies. The methodologies include using data from a prior BEA release, historical data in the same time series, available information at a lower level of industry refinement, and existing data or estimates from a different concept along with a ratio of the two concepts (for example estimating employment from known compensation and compensation rate in that industry). The minimum and maximum values of each suppressed cell are used as bounds that give a range in which the estimates should fall. The best estimate that falls within the given range is chosen, and for a small handful of cases with either very tight bounds or no available estimates that fall within the bounds, the midpoint of bounds is used.

This set of estimates is then passed into an iterative bi-proportional fitting routine to further refine the values such that they sum to their appropriate totals. The particular RAS method we use in this step is also constrained and scaled based on the minimum and maximum value for each suppression.

Estimation of Summary-Level Data Suppressions in Counties

There are three major data sets from the BEA Local Area Personal Income (REIS) series that need to be unsuppressed: (1) CA05 – Personal income and detailed earnings by industry; (2) CA06 – Compensation by industry; and (3) CA25 – Total Employment by industry. These data cover the more than 3000 counties within the U.S. The NAICS-based industry data begins in 2001.

As in the case of the state level data, the solving methodology is to use iterative proportional fitting after generating estimates based on the best available information. The minimum and maximum values are calculated based on all available data (i.e. industries add up to a known total, counties add up to a known state). This takes into account our final estimates for the state level data, treating it as known data. The BEA suppression codes are also used in these calculations when a minimum or maximum value can be derived from the code used. Suppressed employment is also set to zero in cases where the matching compensation and personal income values are known or estimated to be zero.

As in the case of the state estimates, the county estimates are then passed into an iterative bi-proportional fitting routine to further refine the values such that they sum to state data and county level data in the latest release from the BEA. In order to reduce the problem size, iterative proportional fitting is run on the county level sector level data first and then the results of the state summary level and county sector level data are treated as known information when running a final iterative proportional fitting on the county summary level data.

In order to calculate the Wages and Salaries data at the summary level we use our final compensation estimates as starting values and run a simple RAS so that they match state summary-level and county totals for Wages and Salaries.

While our methodology yields the complete, detailed, and internally consistent data sets required by the model, one must keep in mind that there is always more than one possible solution, so, while we have generated "a" solution, it is not necessarily "the" solution. The government goes to great length to suppress data in such a way that the real values cannot be determined. Our solution is not perfect, but we believe for the most part that it is reasonable.

B. Supplementary Historical Data

Fuel Cost Data

State-specific relative fuel costs for three types of fuel (electricity, natural gas, residual fuel) are calculated for the industrial (all manufacturing) and commercial (all non-manufacturing) sectors of the model based on unit cost data obtained from the Energy Information Administration State Energy Data System (SEDS).

Fuel Weight Data

Total energy expenditure estimates by sector (residential, commercial, industrial, transportation, and electric utilities), by type (total, electricity, natural gas), and by state are obtained for a recent year from the Energy Information Administration. Residual energy is calculated as total minus electricity and natural gas. Fuel weights are then calculated for each state by sector (the proportion of total fuel expenditures that are electricity, natural gas, and residual); the weights should add up to 1. The industrial sector fuel weights are applied to the manufacturing industries, transportation to transportation industries, electric utilities to utilities industries, and commercial to everything else. The residential sector is not used.

Tax Data

To calculate the cost of capital variable, the model requires both state-specific and national-average corporate profit and property tax rates. In the absence of a consistent and complete data source, the tax rates are estimated as follows.

State and US corporate profit tax rates are defined as the amount of tax collections divided by the amount of corporate profits. The tax collections are found in the Government Finances (Revenue) publication and are converted from fiscal year to calendar year. Profits for states are constructed by sharing the national corporate profits to each state based on gross state product. The effective tax rate is simply the tax collections divided by the estimated profits. Corporate profits for the US are taken from the Bureau of Economic Analysis' National Income by Type of Income table.

State and US property tax rates are defined as the amount of tax collections divided by the level of residential and nonresidential capital stock. Again, tax collections are taken from the Government Finances (Revenue) publication, and converted from fiscal to calendar year. Nonresidential capital stock is calculated by estimating the state's share of national nonresidential capital stock based on estimated profits (see above). Residential capital is estimated similarly, but disposable income is used as the weight. U.S. investment and capital stock data for residential and nonresidential structures are taken from the Bureau of Economic Analysis' Fixed Assets tables.

Cost of Capital Data

In addition to the tax rates described above, exogenous variables for the cost of capital equation include Moody's AAA bond rates, investment tax credit rates, and the proportion of business capital financed by bonds and loans. The latter is estimated from the *Quarterly Financial Report for Manufacturing*, while all of the other variables are taken from the Bureau of Economic Analysis' Interactive Tables.

Housing Price Data

National, state and county median values of owner-occupied housing units are obtained from the *Census of Housing* for the year 2000. National, state, and available county median values are obtained from the American Community Survey one year estimate beginning in 2005. Counties not available from ACS are assumed to change at the state rate. Values for the years between 2000 and 2005 are interpolated based on national and state single family housing price indexes from the FHFA.

C. National Forecast Data

BLS Forecast Data

The REMI model's baseline national forecast is primarily based on the BLS Employment Outlook: 2016-2026, released in October 2017. Input-output, final demand, and value added data are developed by the U.S. Bureau of Labor Statistics in the Office of Occupational Statistics and Employment Projections.

The BLS projections assume a labor market in equilibrium, i.e., one where labor supply meets labor demand except for some degree of frictional unemployment.

For the 2026 projections, input-output, final demand, and value added data were developed for the years 1997-2016 and projected year 2026. Historical tables are provided in both nominal (current) dollars and in 2009 chain-weighted real dollars. The projected tables are provided in real dollars only.

Dollar value matrices are expressed in millions of dollars rounded to three decimal places. Therefore, they may not add exactly to their totals due to rounding error. In the real tables, the data do not add up to published totals like gross domestic product because of chain weighting.

These data are based on the 2012 North American Industrial Classification System (NAICS) and derived from input-output data initially developed by the Bureau of Economic Analysis.

Input-output data shows the flow of commodities from production through intermediate use by industries and purchases by final users. This data is developed as a set of matrices or tables for each year.

The "USE" matrix contains the sales of commodities sold to intermediate consumers and final demand. In addition, it contains the intermediate inputs and value added factors of production to industries for the production of their product. Each column sums to its respective industry output. Each row sums to its respective commodity output.

The "MAKE" matrix details the production of commodities by industries. Each row sums to industry output and each column sums to commodity output.

The "FD" matrix is a detailed set of 155 final demand types. Each of the 155 columns is distributed across the 205 commodities identified in the input-output system. This matrix is the final demand "bridge" table, showing detailed purchases for 155 categories of expenditures for the year specified in the matrix name.

For the years 2001-2016 and 2026, REMI converts the industry-by-commodity USE matrix and the commodity-by-industry MAKE matrix into an industry-by-industry input-output table of flows, and subsequently a matrix of coefficients. The FD matrix is converted into a bridge matrix of coefficients.

For the non-benchmark years between 2016 and 2026, a linear interpolation method is used to estimate the coefficients. The 2026 coefficients are extrapolated forward to 2060 (see document *Methodology for the New National Forecast*).

The BLS includes as "special industries" noncomparable imports, scrap, used and secondhand goods, and rest of world adjustment. For noncomparable imports, rest of world adjustment, and used and secondhand goods, there is no production in the United States, and thus no domestic commodity or industry output.

For scrap, there is domestic production, although that production is not by a "scrap" industry, but by other industries as a part of the production of their output. For REMI purposes, we need to account for these values in our industry-by-industry matrix. For scrap and used and secondhand goods, the great majority of which are automobiles, we made the assumption that most of these goods would at some point pass through the wholesale industry, so we simply aggregated them with wholesale. For noncomparable imports and rest of world adjustment, we defined a separate category within the components of demand, imports, and exports that properly accounts for the entire IO structure in order to maintain a balanced table without impacting other industries.

The Office of Occupational Statistics and Employment Projections (OOSEP) develops output, price, and employment data for use in the Bureau's biennial economic and employment projections. The most recent set of projections were developed for the year 2026 with data for 205 detailed industries. The projections were released in October 2017.

The output measures follow the definitions and conventions used by the Bureau of Economic Analysis (BEA) in its input-output tables, published every five years. These industry output measures are based on producer's value and include both primary and secondary products and services. The main data sources for compiling the output time series for manufacturing industries are the Census Bureau's *Annual Survey of Manufactures*. Data sources for nonmanufacturing industries are more varied. They include the Census Bureau's Service Annual Survey, the BEA's National Income and Product Accounts (NIPA) data on new construction and personal consumption expenditures, IRS data on business receipts, and many other sources. The constant dollar industry output estimates for the most recent years are based on BLS employment data and trend projections of productivity. The output series are benchmarked to the industry/commodity outputs from the BEA Benchmark 2007 input-output tables, as published in December of 2013.

The annual price data are developed in a manner so as to conform to BEA's National Income and Product Accounts. For manufacturing, they are based on industry sector price index data collected by BLS, and are chain-weighted from the four-digit NAICS to OOSEP's detailed industry sectors. Nonmanufacturing prices, developed at the level of OOSEP's detailed industry sectors, use a variety of different sources, in many instances the BLS consumer price index data. In industries where such underlying price data have not yet been developed, imputations of price change are made from other data series. All aggregate series are chain-weighted from OOSEP's detailed industry sectors. This is necessitated by the benchmarking of the output series to the base year input-output tables.

The employment data are from the BLS Current Employment Survey (for wage and salary jobs and average weekly hours), the Current Population Survey (for self-employed and unpaid family worker jobs, agricultural employment, and private household employment, except logging), and ES-202 Employment and Wages data collected from the unemployment insurance program (for industries unpublished in the CES).

Official BLS productivity measures are produced by the Office of Productivity and Technology. Although output per hour measures can be calculated from the OOSEP estimated constant dollar output and employment data, those calculations do not reflect the official BLS productivity measure. In developing the employment projections, OOSEP does not rely specifically on the output per hour implied by the output and employment data. Especially for the nonmanufacturing industries, development of constant dollar output is problematic. OOSEP discounts the reliability of the constant dollar output and the implied output per hour as an analytic basis for problem industries in favor of trend analysis of the employment data series, which is generally considered more reliable.

Between 2016 and 2026, REMI uses a labor-force-growth-trended forecast for GDP and its components (final demand). After 2026, the BLS-projected labor force participation rates and population projections estimated by REMI for the US (based on death rates, middle range birth rates, and international migration data from the Census) are used to forecast the labor force. An initial estimate of final demand is made, and then adjusted until the resulting growth in employment comes in line with the labor force.

Once the BLS trended forecast is in place, and then extended to 2060, the U.S. Macroeconomic Values procedure of PI^{+} is run using the latest short-term national forecast from the University of Michigan's Research Seminar in Quantitative Economics (RSQE). This updates the national forecast with the current national business cycle. Then the GDP and component growth rates available from the CBO's Long-Term Budget Outlook and EIA's Annual Energy Outlook are applied for the longer term forecast.

RSQE Forecast Data

RSQE is an economic modeling and forecasting unit which has been in operation at the University of Michigan since 1952. RSQE provides forecasts of the U.S. national economy on a seven-times-per-year basis and forecasts of the Michigan economy on a four-times-per-year basis.

BLS Occupation Data

The National Industry-Occupation Employment Matrix is developed by the Bureau of Labor Statistics as part of its ongoing Occupational Employment Projections Program. These data, derived from the 2016-2026 National Employment Matrix, underlie information on occupational employment growth presented in the *Occupational Outlook Handbook*.

Occupational classification

The occupations covered reflect the occupational classification used in the Occupational Employment Statistics (OES) survey, the source used to generate data to develop the 2016 National Employment Matrix. The OES survey data are consistent with the 2010 Standard Occupational Classification (SOC) system. Data on the self-employed, the unemployment rate, and the percentage working part-time are based on Current Population Survey (CPS) data for equivalent occupations. A crosswalk was used to distribute CPS data to occupations in the National Employment Matrix.

Industry classification

Industries covered in the national employment matrix reflect the 2012 North American Industrial Classification System (NAICS). Self-employed, unpaid family workers, and workers who have a second job in agriculture production, forestry, fishing, or private households are listed separately in order to derive total employment.

Data suppression

Occupation and industry cells with less than 50 workers are not displayed in the search results.

Projections methodology

The Bureau of Labor Statistics projections of industrial and occupational employment are developed in a series of six interrelated steps, each of which is based on a different procedure or model and related assumptions: labor force, aggregate economy, final demand (GDP) by consuming sector and product, industrial activity, employment by industry, and employment by occupation. The results produced by each step are key inputs to the following steps, and the sequence may be repeated multiple times to allow feedback and to insure consistency.

REMI aggregates the detailed industries to 160, 70, or 23, as applicable, and the detailed occupations to 95 or 18. The fixed proportion of occupational employment is calculated by summing the employment across an industry, and then dividing each occupation by the industry total. The rates of occupational change between 2016 and 2026 are calculated by linear interpolation, then extended back historically at the same rate of change, and extended forward at one-half the rate of change.

Data Sources Behind REMI's County Model

LHYR 2016

Concept	Source	Last Available Historical Year	Notes
ECONOMIC			
Employment	BEA-LAPI CBP	2001 – 2016 2015	
Wages	CBP	2015	
Personal Income	BEA-LAPI	2001 – 2016	
Compensation	BEA-LAPI	2001 – 2016	
Commuter Flows	BEA Net flow of earnings BEA Gross flow of earnings BEA Journey to Work ACS Commuter Flows	2001 – 2016 2001 – 2016 2000 2009-2013	
Unit Fuel Cost	State-level data used: Energy Information Administration	2001 – 2015	Electricity, Natural Gas, Residual Fuel
Purchased Fuel Weights	State-level data used: Energy Information Administration	2012	
Corporate Profit Tax Rate	Calculated State rate used: (collections/profits)		
Collections	www.census.gov Government Finances	2001 – 2016	Corporate Net Income & Corporations in General
Estimated Profits	BLS technical coefficients matrix and REMI estimated output	2001 – 2016	
Property Tax Rate	Calculated; state rates used: (collections/cap. stock) see next two rows		This rate reflects both residential & non-residential capital
Collections	www.census.gov Government Finances	2001 – 2015	
Estimated Stock	Allocation of U.S. non-residential and residential stock by the state's profit and real disp. income weights	2001 – 2016	
Personal Income Taxes	BEA State Rates	2001 – 2016	
Housing Prices (Median Sales Price of existing Single-Family Homes)	Census of Housing ACS FHFA	2000 2005 – 2016 2000 – 2004	Counties, States, Nation Some Counties, States, Nation States, Nation

Concept	Source	Last Available Historical Year	Notes
DEMOGRAPHIC			
Population	BEA Census: decennial (1 yr cohort), intercensal (5 yr cohort)	2001 – 2016 2000; 2010 2001 – 2016	Reconciled to BEA for consistency
Births, Deaths, Net International Migrants	Census	2000 – 2016	Net international migrants reconciled with national totals
Natality Rates	Center for Disease Control and Prevention, National Center for Health Statistics	2000 – 2010	State rate used
Survival Rates	Census: Population Projections of the United States by Age, Sex, Race, Hispanic Origin, and nativity: 1999-2100	1999 – 2100	National survival rates adjusted to fit regional deaths observed in history
Retired Migrants	Census 2000 Migration Data on DVD	2000	Age-specific retired migration rates are calculated using 2000 census data
Military Population	Census Department of Defense American Community Survey	2000; 2010 2001 – 2016 2005 – 2016	Personnel by Location from DoD. Data by Race and Sex for 2000 and 2010 only.
Military Dependents	Department of Defense	2003-2016	National totals only; dependents are assigned to regions based on size of Military population.
College Population	Census National Center for Education Statistics American Community Survey	2000; 2010 2000 – 2016 2005 – 2016	Data by Race and Sex for 2000 and 2010 only
Prisoner Population	Census Bureau of Justice Statistics Bureau of Prisons	2000; 2010 2001-2016 2005-2016	Data by Race and Sex for 2000 and 2010 only 50 largest jail jurisdictions mapped to counties Facilities mapped to counties
Labor Force	Census Bureau of Labor Statistics	2000; 2010 2000-2016	Data by Race and Sex for 2000 and 2010 only

LHYR 2016

Concept	Source	Last Available Historical Year	Notes
ECONOMIC			
Employment	BEA	2001 – 2016	Total Employment series
Wages	BEA	2001 – 2016	
Personal Income	BEA	2001 – 2016	
Compensation	BEA	2001 – 2016	
Commuter Flows	BEA Net flow of earnings BEA Gross flow of earnings BEA Journey to Work ACS Commuter Flows	2001 – 2016 2001 – 2016 2000 2009 – 2013	
Unit Fuel Cost	Energy Information Administration	2001 – 2015	Electricity, Natural Gas, Residual Fuel
Purchased Fuel Weights	Energy Information Administration	2012	
Corporate Profit Tax Rate	Calculated (collections/profits) see next two rows		
Collections	www.census.gov Government Finances	2001 – 2016	Corporate Net Income & Corporations in General
Estimated Profits	BLS technical coefficient matrix and REMI estimated output	2001 – 2016	Estimated series is normalized for bottom-up consistency to reported U.S. profits.
Property Tax Rate	Calculated (collections/capital stock) see next two rows		This rate reflects both residential and non-residential capital
Collections	www.census.gov Government Finances	2001 – 2015	
Estimated Stock	Allocation of U.S. non-residential and residential stock based on the state's profit and real disp. income weights.	2001 – 2015	
Personal Income Taxes	BEA	2001 – 2016	Includes federal, state & local collections
Housing Prices (Median Sales Price of existing Single-Family Homes)	Census of Housing ACS FHFA	2000 2005 – 2016 2000 – 2004	Counties, States, Nation Some Counties, States, Nation States, Nation

Concept	Source	Last Available Historical Year	Notes
DEMOGRAPHIC			
Population	BEA Census: decennial (1 yr cohort), intercensal (5 yr cohort)	2001 – 2016 2010 2000 – 2016	Reconciled to BEA for consistency
Births, Deaths, Net International Migrants	Census	2000 – 2016	Net international migrants reconciled with national totals
Natality Rates	Center for Disease Control and Prevention, National Center for Health Statistics	2000 - 2010	
Survival Rates	Census: Population Projections of the United States by Age, Sex, Race, Hispanic Origin, and nativity: 1999-2100	1999 – 2100	National survival rates adjusted to fit regional deaths observed in history
Retired Migrants	Census 2000 Migration Data on DVD	2000	Age specific retired migration rates are calculated using 2000 census data
Military Population	Census Department of Defense American Community Survey	2000; 2010 2001 – 2016 2005 – 2016	Personnel by Location data from DoD. Data by Race and Sex for 2000 and 2010 only.
Military Dependents	Department of Defense	2003 – 2016	National totals only; dependents are assigned to regions based on size of Military population.
College Population	Census National Center for Education Statistics American Community Survey	2000; 2010 2000 – 2016 2005 – 2016	Data by Race and Sex for 2000 and 2010 only
Prisoner Population	Census Bureau of Justice Statistics Bureau of Prisons	2000; 2010 2001 – 2016 2005 – 2016	Data by Race and Sex for 2000 and 2010 only 50 largest jail jurisdictions mapped to counties Facilities mapped to counties
Labor Force	Census Bureau of Labor Statistics	2000; 2010 2000 – 2016	Data by Race and Sex for 2000 and 2010 only

Data Sources Behind REMI's U.S. Model

LHYR 2016

Concept	Source	Last Available Historical Year	Notes
ECONOMIC			
Employment	BEA	2001 – 2016	Total Employment series
Wages	BEA	2001 – 2016	
Personal Income	BEA	2001 – 2016	
Compensation	BEA	2001 – 2016	
Occupational Matrix	BLS	2016; 2026	Details 94 occupations, linearly interpolated
Productivity	BLS	1997 - 2016; 2026	Calculated from detailed E & Q data
Technology Matrix	BLS	1997 - 2016; 2026	Make & Use matrices converted to industry-by-industry matrices. Interpolated for in-between years.
Industry Deflators	BLS	1997 – 2016	Nominal & real Q to calculate deflators
Final Demand	BLS	1997 - 2016; 2026	
Commodity Prices	www.bea.gov NIPA tables	2001 – 2016	
Unit Fuel Cost	Energy Information Administration	2001 – 2015	Electricity, Natural Gas, Residual Fuel
Purchased Fuel Weights	Energy Information Administration	2012	
Corporate Profit Tax Rate	Calculated (collections/profits) see next two rows		
Collections	*www.census.gov* Government Finances	2001 – 2016	Corporate Net Income & Corporations in General
Profits	*www.bea.gov* National Income table	2001 – 2016	Moving average to convert from fiscal year to calendar year.
Property Tax Rate	Calculated (collections/capital stock) see next 2 rows		This rate reflects both residential & non-residential capital
Collections	*www.census.gov* Government Finances	2001 – 2015	
Estimated Stock	*www.bea.gov* Fixed Assets table	2001 – 2015	
Personal Income Taxes	BEA	2001 – 2016	Includes federal, state & local collections
Business Cycle	RSQE	2017 – 2019	
Housing Prices (Median Sales Price of existing Single-Family Homes)	Census of Housing ACS FHFA	2000 2005 – 2016 2000 – 2004	Counties, States, Nation Some Counties, States, Nation States, Nation

Concept	Source	Last Available Historical Year	Notes
DEMOGRAPHIC			
Population	BEA Census: (1 yr. cohort)	2001 – 2016 2001 – 2016	Reconciled to BEA for consistency
Births, Deaths, Net International Migration	Census	2000 – 2016	
Natality Rate, Survival Rate, Net International Migration Forecasts	Census: Population projections of the United States by Age, Sex, Race, Hispanic Origin, and Nativity	1999 – 2100	
Labor Force	BLS	2000 – 2016	
Labor Force Participation Rates Forecast	BLS	2001 – 2050	
Military Population	Census; Department of Defense	2000; 2010 2001 – 2016	
Military Dependents	Department of Defense	2003 – 2016	
College Population	Department of Education; National Center for Education Statistics	2000 – 2016	
Prisoner Population	Census; Bureau of Justice Statistics Bureau of Prisons	2000; 2010 2001 – 2016 2005 – 2016	 50 largest jail jurisdictions mapped to counties Facilities mapped to counties