

Preview of the 2018 Comprehensive Update of the Industry Economic Accounts

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In November 2018, the Bureau of Economic Analysis (BEA) will release the results of the 2018 comprehensive update of the Industry Economic Accounts (IEAs). The last comprehensive update of the IEAs was released in January 2014.

Comprehensive updates, which are typically conducted at 5-year intervals, tend to have a more expansive scope than annual updates and provide an opportunity to update the accounts to better reflect the evolving U.S. economy. Typically, these updates incorporate two major types of improvements: (1) changes in definitions and classifications, which update the accounts to more accurately portray the dynamic U.S. economy and to better facilitate comparisons with economic data available from other countries, and (2) statistical changes, which update the accounts through the use of new and improved estimation methods and newly available and revised source data, including the Economic Census which is used to benchmark the accounts. Combined, these improvements enable the accounts to continue to accurately measure the structure of the U.S. economy. Major additions and changes to be introduced in the 2018 comprehensive update include the following:

- Incorporation of the results of the 2018 comprehensive update of the national income and product accounts (NIPAs).¹
- A shift in emphasis toward supply-use tables (SUTs) consistent with international recommendations from the *2008 System of National Accounts (SNA)* and away from the current make-use framework.
- Release of the new 2012 detailed benchmark SUTs.
- Release of updated 2007 detailed benchmark SUTs consistent with the full time series of annual tables as well as the new 2012 benchmark tables.²
- Updated industry and commodity definitions consistent with the 2012 North American Industry Classification System (NAICS).

- Introduction of more detailed annual data on value added, gross output, and intermediate inputs at roughly the four-digit NAICS level of detail (138 industries) as part of the underlying detail for the IEAs. Currently, the most detailed annual data are published at roughly the three-digit NAICS level (71 industries).

A major highlight of the 2018 comprehensive update to the IEAs will be the release of the 2012 benchmark SUTs. Benchmark tables provide a detailed picture of the economy, showing relationships among hundreds of industries and commodities. Benchmark tables also serve as the statistical foundation for other BEA estimates, including gross domestic product (GDP). More specifically, the levels and commodity distributions of final-use categories are set as part of a reconciliation process between production-based data from the SUT framework and expenditure-based data from the NIPAs.

As part of the upcoming 2018 comprehensive update, BEA will feature real estimates and price measures that use 2012 as the reference year; the current reference year is 2009. With this change, quantity indexes and price indexes will be set to 100 in 2012. Updating the reference year will not affect the percent changes in the price or quantity indexes (or in the chained-dollar estimates) because changes measured using chain-type indexes are unaffected by updates to the reference period.³

In addition, beginning with this update, BEA's featured set of input-output tables will be presented in the supply-use framework, as recommended in the *SNA 2008*. With this change, U.S. data will be presented using valuations and a presentational format more comparable to international data. Although the supply-use format will be the featured set of input-output tables, BEA will continue to publish data in the current make-use format as supplementary tables.⁴

The following sections include a summary of the major changes in definitions, changes in industry classification, improvements to statistical methods, and changes to source data. [Appendix A](#) includes the proposed list of industries and commodities to be published in the 2012 benchmark SUTs and describes the expanded annual publication levels introduced with the 2018 comprehensive update as part of BEA's underlying detail tables.

Changes in Definition

As part of the 2018 comprehensive update, several major changes in definition will be incorporated into both the IEAs and the NIPAs, reflecting ongoing work to further integrate these two sets of statistics. These changes include the following:

- Reclassification of research and development (R&D) for software originals from own-account software (OAS) to own-account R&D
- Recognition of capital services in own-account investment in software and R&D
- Reclassification of "other" state and local personal current taxes as "other" taxes on production

Reclassification of R&D for software originals

With the release of the comprehensive update, software originals have been reclassified from OAS to R&D in order to bring the estimates of R&D more in-line with primary data sources and treatment of own-account production within the SUTs.

Own-account production is a form of “nonmarket” output produced by establishments providing their own capital goods. OAS occurs when companies develop or improve their own software rather than purchasing custom-made and prepackaged software from companies primarily engaged in software development.

Software purchases and the costs associated with own-account production of software were first capitalized in the 1999 comprehensive update of the NIPAs, though this iteration excluded software originals.⁵ In the 2003 comprehensive update of the NIPAs, OAS originals used for reproduction were recognized as investment.⁶ With the introduction of R&D as fixed investment, it was recognized that research associated with the development of software would result in an overlap between OAS investment and R&D investment, which would result in double counting. In the R&D satellite account, beginning with the 2007 update, the estimates handled the overlap by reclassifying OAS R&D as R&D.⁷ In contrast, the official 2013 implementation of R&D as fixed investment in the NIPAs did not reclassify software R&D as R&D. Instead, it continued to be classified as OAS investment in the NIPAs.

This treatment introduced an inconsistency between the NIPA measures and the primary source data underlying the estimates of investment in R&D, which will be resolved by reclassifying the own-account production of software originals from OAS to own-account R&D within private fixed investment.

Effects on the estimates. In the supply table, industries that produce software originals will see a decrease in their secondary production of OAS and an increase in their production of own-account R&D. This will result in an overall increase in the domestic supply of R&D and a corresponding decrease in the domestic supply of software. In the use table, these changes in commodity output will be absorbed within private fixed investment through an increase in investment purchases of R&D and an offsetting decrease in purchases of software. The changes will be offsetting for 1997–2001 with no impact on the top line value of total private fixed investment or on GDP. For 2002 forward, the revisions will not be equal, because they will also reflect updated assumptions that underlie the measurement of OAS.

Capital services in own-account software and R&D

As part of this comprehensive update, BEA will improve the accuracy of its measures by incorporating the value of the return to fixed capital into the estimates of private own-account investment in software and in R&D beginning with 2007. The new treatment is consistent with international standards and will provide more complete estimates of the opportunity costs of

own-account investment, provide improved measures of the sources of economic growth and productivity, and contribute to the literature on measuring own-account investment and intangible assets.

Currently, BEA measures investment in OAS as the sum of costs, including reported charges for depreciation of fixed assets used in the production of own-account investment but excluding the value of the return to capital. Estimates are based on data on the compensation of employees and the costs of intermediate inputs used in its production. The compensation measures are based on data (1) on employees from the Bureau of Labor Statistics (BLS) Occupational Employment Statistics (OES), (2) on NIPA wage data, and (3) on intermediate input costs based on relationships between intermediate inputs and compensation that are derived primarily from the Census Bureau's Economic Census. The estimates for R&D are based primarily on National Science Foundation (NSF) data on the reported expenditures for R&D.

Under the new treatment, BEA will continue to estimate private own-account investment in software as the sum of the associated costs, but the measure of depreciation will be replaced with a measure of capital services—that is, a measure that reflects both the depreciation and the return to capital. For R&D, NSF reported expenditures for depreciation are replaced with BEA-derived capital services measures. These capital services measures will be based on BLS external rates of return and BEA data on prices, depreciation, and capital stocks.

Effects on the estimates. In the supply table, industries that produce own-account R&D will see an increase in their secondary production of this commodity. In the use table, the resulting increase in the domestic supply of R&D will be absorbed by increases in total private fixed investment and in GDP.

Reclassification of state payroll taxes

BEA measures of the “other” category of state and local government personal current taxes are based on Census Bureau data on hunting and fishing licenses and on “taxes not elsewhere classified.” Historically, these Census Bureau series aligned well with the BEA definition of personal current taxes and were consistent with international guidelines. However, the Census Bureau data on “taxes not elsewhere classified” now include the revenue generated by state payroll taxes introduced in Nevada in 2007 and in New York in 2010. According to the recommendations in the SNA, payroll taxes are primarily a tax on employers and thus a tax on production rather than on persons or households.

With the comprehensive update, BEA will split the Census Bureau data for “taxes not elsewhere classified” for Nevada and New York from the data for all the other states; the taxes for other states will continue to be included in personal current taxes, but the taxes for Nevada and New York will be recorded partly as other taxes on production, a component of taxes on production and

imports. This reclassification will bring the NIPA estimates of personal current taxes and taxes on production back into alignment with SNA recommendations. It will also improve the accuracy of the by-sector distribution of tax payments.

Effects on the estimates. With this change, other taxes on production will increase in the use table with an offsetting decrease in gross operating surplus, leaving value added by industry unaffected.

Changes in Classification

IEA statistics released as part of the 2018 comprehensive update will be classified and presented on a 2012 NAICS basis; currently, the statistics are classified and presented on a 2007 NAICS basis. Overall, changes stemming from using the 2012 NAICS are small; the manufacturing and retail trade sectors have several changes, but none involved reclassification to another sector.⁸

Notable coding changes

With this comprehensive update, BEA has implemented coding changes at the benchmark level of detail to include expanded codes in real estate, insurance, and general state and local government services (table 1). [Appendix A](#) includes the full list of industries and commodities to be published in the 2012 benchmark SUTs.

Table 1. Effects of Expanding Benchmark Industry Detail on the Real Estate, Insurance, and General State and Local Government Services Sectors

| 2007 BEA codes | Current publication level | 2012 BEA codes | Proposed publication level |
|----------------|---|-------------------------|--|
| HS | Real estate | HSO HST | Owner-occupied housing Tenant-occupied housing |
| 524100 | Insurance carriers | 524113 5241X | Direct life insurance carriers Insurance carriers, except direct life |
| GSLG | General state and local government services | GSLGE GSLGH GSLGO | State and local government (educational services) State and local government (hospitals and health services) State and local government (other services) |

Reclassification of secondary production of wholesale and retail trade

To provide a more detailed assignment of trade margins within the supply-use framework, secondary production of retail and wholesale commodities will be broken-out to reflect the specific type of retail or wholesale commodity, as opposed to being captured in a single aggregate commodity. This reallocation represents a significant improvement in the specificity and granularity of the trade margin data.

Introduction of new underlying detail in annual publication

In addition to NAICS-based changes to the proposed benchmark presentations, the 2018 comprehensive update introduces more detailed annual data that correspond to roughly the four-digit NAICS level of detail. As part of the update, BEA plans to introduce new underlying detail tables to provide more transparent and granular data to users annually. Of the 71 currently published annual industries, 24 have been selected for expansion based on the reliability of underlying source data, the magnitude of the series, and user interest. [Appendix A](#) includes information on the expanded annual underlying detail publication levels introduced with this update.

Statistical Improvements

Statistical improvements are changes in estimation procedures to incorporate new and improved methods as well as newly available and revised source data. Several notable improvements in statistical methods will be introduced with the release of the 2018 comprehensive update. These improvements include the following:

- Reclassification of taxes
- Introduction of new digital media product lines to the information sector

Reclassification of taxes

As part of the transition to the supply-use framework, BEA will improve the distinction between “taxes on products” (TOP) and “other taxes on production” (OTOP). The new treatment is consistent with the recommendations of the SNA 2008 and will enhance the comparability of the NIPA measures of taxes on production and imports with measures in the industry accounts.

Taxes on products are taxes payable per unit of some goods and services, like a sales or excise tax.⁹ In contrast, other taxes on production encompass additional taxes incurred by engaging in production, such as property taxes, motor vehicle licenses, alcohol licenses, and other licenses. In the supply table, TOPs by commodity are presented in the Tax on Products column, one component of the transformation matrix that converts domestic supply from basic to purchasers’ prices. Similarly, TOPs by industry appear in the addendum to the use table as part of the transformation of value added from basic to purchasers’ prices. The OTOPs by industry appear as part of value added in the use table. Currently, this break-out in the SUTs is accomplished using a series of definitions, concordances, and weights to distribute value between the two types of taxes.

The distinction provides information on the portion of taxes that is dependent on the level of production as compared with taxes that vary only with longer term changes in the ownership or use of fixed assets in production. As excise taxes are levied only on specific goods—often goods such as alcohol, tobacco, or fuel—their distinction from more general sales taxes will enhance analyses of the revenues generated by general, versus targeted, taxation.

Effects on the estimates. The updates in taxes will have no aggregate effect on the estimates as the changes represent reassignment of value rather than the introduction of new value to the SUTs. However, the distribution of taxes across different categories will change, and the accuracy of TOPs by commodity and OTOPs by industry will be significantly enhanced.

Introduction of new digital media products to the information sector

This comprehensive update will introduce an improvement to the statistical methods used to produce information sector estimates related to audiovisual works sold directly to consumers, including digital downloads. New 2012 Economic Census revenue data, which captures downloads of electronic media for permanent ownership, will be included in the IEAs. In addition, the 2018 comprehensive update will introduce a method to capture retail trade sales statistics for “Video content downloads,” the retail trade industry’s secondary production of digital downloads.

Effects on the estimates. BEA expects digital media content to show significant growth moving forward. With the rising importance of the digital economy, incorporating this improvement is an important step toward capturing this dynamic and rapidly changing sector of the economy with improved accuracy.¹⁰

Source Data

The primary data source for the benchmark SUTs is the Economic Census, which the Census Bureau conducts every 5 years. The Economic Census is the preferred data source because it provides the most comprehensive data available in terms of industry coverage and captures activity in the relevant economic units for those industries. The Economic Census collects data at the level of the smallest operating unit, the “establishment,” and provides most of the essential data required for the tables, including inventories, receipts and expenses of business establishments and of government, sales by detailed industry and product line, final industry and product shipments, input costs by general category, and trade margins.

For 2014 through 2017, the updated estimates will also reflect the incorporation of newly available and revised source data which are regularly included in the annual updates, and which became available after the annual update in November of 2017. These data include the following:

- Annual Survey of State and Local Governments for fiscal year 2015 (revised) and 2016 (new)
- Annual Survey of Manufacturers for 2015 (revised) and 2016 (new)
- Annual Survey of Wholesale Trade for 2015 (revised) and 2016 (new)
- Annual Survey of Retail Trade for 2015 (revised) and 2016 (new)
- Service Annual Survey for 2016 (revised) and 2017 (new)
- Value of Construction Put-In-Place for 2015 and 2016 (revised) and 2017 (preliminary)
- OMB Federal Government Budget Data for fiscal Year 2017 (revised) and 2018 (new)

- BEA data for 2015–2017 (revised) from the International Transactions Accounts
- BLS Quarterly Census of Employment and Wages for 2014–2016 (revised)
- IRS Tabulations of corporate tax returns for 2015 (revised) and for 2016 (new)
- IRS Tabulations of sole proprietorship and partnership tax returns for 2016 (new)
- U.S. Department of Agriculture Farm Statistics for 2015–2017 (revised)

Principal sources of data used to construct current-dollar and chained-dollar estimates for benchmark and non-benchmark years can be found in tables A and B. Additional details, including a table presenting principal sources of data used to construct the quarterly estimates will be included in a forthcoming article that will describe the results of the 2018 comprehensive update of the IEAs.

Gross output

Starting in 2010, data from the Census Bureau’s Service Annual Survey (SAS) replaced Bureau of Transportation Statistics (BTS) data as the annual indicator for the Air Transportation industry. The SAS data will provide break-outs of domestic and international freight and passenger transportation that assist in the construction of extended supply-use tables. The Economic Census was used to establish the 2007 and 2012 pillar estimates for the time series, and the 2007 level was backcast to 1997 using data from BTS. BTS data are also used as the source indicator up to 2010 when it was replaced with SAS data to complete the time series.

For IEA quarterly statistics, the Census Bureau’s Quarterly Services Survey (QSS) data will be used as output indicators in place of existing NIPA personal consumption estimates (PCE) for educational services and accommodation services. NIPA PCE indicators capture personal consumption and do not include business intermediate purchases, while the QSS data captures both. Output estimates for the educational services industry and the accommodation services industry will be improved by the replacement because the QSS data will more accurately reflect activities that are conceptually included in those industries.

Prices

BEA continually strives to improve the price indexes used throughout the industry accounts and consults regularly with colleagues at BEA, BLS, and the Federal Reserve Board (FRB). As part of the upcoming 2018 comprehensive update, BEA will introduce several improved indexes and will extend improvements introduced in prior updates.

Software, medical equipment, and communications equipment. Software, medical equipment, and communications equipment typically experience rapid innovation and are associated with state-of-the-art technologies. Such products present challenges when using standard matched-model techniques to construct quality-adjusted price indexes. As part of the 2018 comprehensive

update, BEA introduced several improved indexes and extended improvements that were introduced in prior updates to previous years to improve the deflation of output measures of software, medical equipment, and communications equipment.¹¹

Amusement, gambling, and recreation. Three new BLS producer price indexes became available within “amusement, gambling, and recreation” and were incorporated into the annual and quarterly time series, replacing more aggregated PCE deflators from the NIPAs.

Tables A and B and Appendix A accompany this article.

1. For more information, see Jason W. Chute, Stephanie H. McCulla, and Shelly Smith, “Preview of the 2018 Comprehensive Update of the National Income and Product Accounts,” *Survey of Current Business* 98 (April 2018).
2. For more information, see Erich H. Strassner and David B. Wasshausen, “Preview of the 2013 Comprehensive Revision of the Industry Economic Accounts,” *Survey* 93 (June 2013): 19–20.
3. See J. Steven Landefeld and Robert P. Parker, “Preview of the Comprehensive Revision of the National Income and Product Accounts: BEA’s New Featured Measures of Output and Prices,” *Survey* 75 (July 1995): 31–38.
4. For additional details on the supply-use framework and how it compares to BEA’s current make-use tables, see Jeffrey A. Young, Thomas F. Howells III, Erich H. Strassner, and David B. Wasshausen, “Supply-Use Tables for the United States,” *Survey* 95 (September 2015).
5. See Brent R. Moulton, Robert P. Parker, and Eugene P. Seskin, “A Preview of the 1999 Comprehensive Revision of the National Income and Product Accounts: Definitional and Classificational Changes,” *Survey* (August 1999): 8–10.
6. See Carol E. Moylan and Brooks B. Robinson, “Preview of the 2003 Comprehensive Revision of the National Income and Product Accounts: Statistical Changes,” *Survey* (September 2003): 23.
7. See Carol A. Robbins and Carol E. Moylan, “Research and Development Satellite Account Update: Estimates for 1959–2004; New Estimates for Industry, Regional, and International Accounts,” *Survey* (October 2007): 53.
8. Concordances between 2007 NAICS and 2012 NAICS are available through the Census Bureau’s website.
9. *System of National Accounts 2008*, paragraph 7.73,143.
10. Background information on BEA’s efforts related to the digital economy are available online.
11. For more information, see Jason W. Chute, Stephanie H. McCulla, and Shelly Smith, “Preview of the 2018 Comprehensive Update of the National Income and Product Accounts: Changes in Methods, Definitions, and Presentations,” *Survey* 98 (April 2018).



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