A Look at How BEA Presents the National Income and Product Accounts

THE NATIONAL INCOME and product accounts (NIPA's) provide a quantitative view of the Nation's output and are best known by the summary measure "gross domestic product" (GDP). The NIPA's are a system of accounts that not only describe the relationship between income and product but that also trace the principal economic flows among the major sectors and industries of the economy. The system of presentation of the NIPA's—for example, the frequency of series (annual, quarterly, or monthly) and historical coverage—has evolved over a number of years and has been shaped primarily by the availability of source data and by the needs of data users.

This guide is designed to assist users in locating estimates in NIPA's, to explain some of the conventions used in their presentation, and to answer some of the most frequently asked questions about the NIPA's. It discusses the availability of the NIPA estimates and the statistical conventions that are used in their presentation. The guide is followed by the "Index to the NIPA Tables," which identifies the NIPA table (or tables) for each NIPA series and each topic covered by the NIPA's and includes cross-references for commonly used business and economic terms to the appropriate NIPA item.

Availability of the NIPA estimates

This section describes the release schedule for the NIPA estimates, the publication of the NIPA tables, and additional presentations of the NIPA estimates.[1]

Release schedule.—For most NIPA series, including GDP, quarterly estimates are released on the following schedule: "Advance" estimates are released near the end of the first month after the end of the quarter; as more detailed and more comprehensive data become available, "preliminary" and "final" estimates are released near the end of the second and third months, respectively.

For gross national product, national income, corporate profits, and net interest, "advance" estimates are not prepared. Except for fourth-quarter estimates, the initial estimates for these series are released with the preliminary GDP estimates, and the revised estimates are released with the final GDP estimates. For the fourth-quarter, these estimates are released only with the final GDP estimates.

Monthly estimates of personal income and outlays are released near the end of the month following the reference month; estimates for the preceding 2 to 4 months are subject to revision at that time.

Annual revisions of the NIPA's are usually carried out each summer and cover the months and quarters of the most recent calendar year and of the 2 preceding years. These revisions are timed to incorporate newly available major annual source data. (Because of the recent comprehensive revision, this year's annual revision will be limited in scope; the next annual revision is scheduled for release in summer 1997.)

Comprehensive revisions are carried out at about 5-year intervals and incorporate three major types of improvements: (1) Definitional and classificational changes that update the accounts to portray more accurately the evolving U.S. economy, (2) statistical changes that update the accounts to reflect the introduction of new and improved methodologies and the incorporation of newly available and revised source data, and (3) presentational changes that update the NIPA tables to reflect definitional, classificational, and statistical changes and to make the tables more informative.

Publication of the NIPA tables.—Tables that present the NIPA estimates appear each month in the "National Income and Product Accounts" section of the SURVEY OF CURRENT BUSINESS.[2] The full set of NIPA tables consists of 138 tables that present annual, quarterly, and monthly estimates. These tables are grouped into nine categories:

1. National Product and Income
2. Personal Income and Outlays
3. Government Receipts and Expenditures
4. Foreign Transactions
5. Saving and Investment
6. Income, Employment, and Product by Industry
7. Quantity and Price Indexes
8. Supplemental Tables[3]
9. Seasonally Unadjusted Estimates

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1. For additional details on the availability of BEA's products and services, see the "User's Guide to BEA Information" in the April 1996 SURVEY. The "User's Guide" is also available on BEA's Internet site (**http://www.bea.doc.gov**).

2. The NIPA estimates appear first in news releases, which are made available to the general public in a variety of forms (see the box "Alternative Media").

3. In this category, the first table shows year-to-year and quarter-to-quarter percent changes in the major NIPA aggregates, and the second table shows contributions of the major expenditure components to the percent change in real GDP. The other tables show the following: Selected per capita series; auto, truck, farm sector, and housing sector output; detail on several components of gross national income (consumption of fixed capital, capital consumption adjustment, business transfer payments, supplements to wages and salaries, rental income of persons, dividends, and interest); imputations; and reconciliations of several NIPA measures with the source data (for example, tax return tabulations) from which they are derived or to which they are closely related. The last table in this category shows fixed (1992) weighted quantity indexes for selected series.

The NIPA tables are numbered as follows: The number preceding the period is the category number, and the number following the period indicates the specific table in that category; for example, table 2.2 is the second table in the second category "Personal Income and Outlays."[4]

Most of the full set of NIPA tables are published in the issues of the SURVEY that describe the annual and comprehensive revisions (for example, see the January/February 1996 SURVEY), but some tables are published in subsequent months.[5]

In the other issues of the SURVEY, a set of "Selected NIPA Tables" is published; this set presents the estimates for the most recent 6 quarters and the most recent 2 years. The selected set comprises 54 tables from the first eight NIPA categories (seasonally unadjusted estimates in the ninth category are compiled only once a year and thus are not included in the selected set of tables). Because the numbering system used for the full set of tables is retained in the selected set, gaps in tables occur in the presentation of the selected tables. A note preceding the NIPA tables indicates information on the vintage of the estimates (see, for example, the headnote on page 7 of this issue).

In general, the NIPA tables in the SURVEY provide estimates for the most recent 2–4 years. The historical estimates are published in a two-volume set after each comprehensive revision. The *National Income and Product Accounts of the United States: Volume*

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4. Letter suffixes are used when there are major discontinuities in coverage that require a change in the line designations for different time periods—for example, when the level of industrial detail cannot be bridged because of a change in the Standard Industrial Classification underlying the estimates. In addition, changes in the coverage, or in the quality, of the statistics result in discontinuities in NIPA time series. It is not possible to identify all of these types of discontinuities, but the major ones are referenced in footnotes to the NIPA tables; for example, see the footnotes to tables 4.1–4.3.

5. Many of these tables show only annual estimates, and they often contain detailed breakdowns of components; for example, NIPA tables 5.6 and 5.7 show purchases of private structures by type (in current dollars and in chained dollars, respectively) in more detail than NIPA tables 5.4 and 5.5, which appear monthly.

Alternative Media

Within minutes after the official news release, the NIPA estimates are available electronically to STAT–USA subscribers on the Economic Bulletin Board or on the Internet. For more information, call STAT–USA at (202) 482–1986.

BEA also prepares recorded telephone messages that summarize key estimates immediately after their release: For gross domestic product, call (202) 606–5306; for personal income and outlays, call (202) 606–5303.

NIPA estimates are also available on diskettes. To obtain an order form indicating their cost and the schedule and cost of related material, write to the National Income and Wealth Division, BE-54, Bureau of Economic Analysis, U.S. Department of Commerce, Washington, DC 20230, or call (202) 606–9700.

2, 1959–92 is scheduled to be published in late 1996, and *Volume 1, 1929–58* is scheduled to be published in early 1997. These volumes also provide information on the definitions, classifications, and conventions underlying the NIPA's.

Historical estimates for summary NIPA series are presented annually in the SURVEY and cover the following: Current- and chained-dollar GDP for most of the components found in NIPA tables 1.1 and 1.2, as well as for final sales of domestic product and gross national product; NIPA price indexes and implicit price deflators; and most of the major components of national income and personal income found in NIPA tables 1.14 and 2.1. These estimates were published as "Summary National Income and Product Series, 1959–94" in the January/February 1996 SURVEY (see pages 107–118).

Additional presentations of NIPA *and* NIPA-*related estimates.*—The SURVEY also contains the following NIPA items that do not fit neatly into the system or publication schedule for the standard NIPA presentation.

"Gross Domestic Product by Industry" presents nominal and real estimates of gross product, or gross product originating, by industry, which is the contribution of each industry—including government—to GDP. Revised estimates for GDP by industry for 1959–94 are scheduled to be published this summer.

"Reconciliation and Other Special Tables" contains tables that reconcile NIPA estimates with related series and that present analytically useful extensions of the NIPA estimates. At present, tables in this section show the reconciliation of relevant NIPA series with related series in the balance of payments accounts and the reconciliation of BEA compensation with Bureau of Labor Statistics earnings.

"Real Inventories, Sales, and Inventory-Sales Ratios for Manufacturing and Trade" (scheduled for January, April, July, and October) shows quarterly and monthly estimates for these series. Also shown are quarterly and monthly inventories for manufacturing by stage of fabrication. The estimates of current-dollar sales are based on Census Bureau data and are deflated by BEA; the inventory estimates are from the NIPA's. Historical estimates for these series, quarterly for 1977 forward, are shown elsewhere in this issue.

"Fixed Reproducible Tangible Wealth in the United States" (usually published in February and September) shows annual estimates of stocks for fixed private capital, government-owned fixed capital, and durable goods owned by consumers. Revised estimates for 1929–95 are scheduled to be published this fall.

"Selected Monthly Estimates" shows monthly estimates for personal income by type of income and for the disposition of personal income, including personal consumption expenditures. These monthly estimates are also published annually in NIPA tables 2.8–2.11, and the estimates for the most recent months appear in the personal income and outlays news release.

"Source Data and Assumptions" shows the source data and the assumptions for missing key source data that are used to prepare the advance estimates of GDP. This information is published as part of the "Business Situation" when the advance estimates appear in the SURVEY.[6]

Statistical conventions used for NIPA estimates

Most of the NIPA estimates are presented in billions of dollars. The major exceptions are certain current-dollar annual estimates, which are presented in millions of dollars, and estimates presented as index numbers. Current-dollar estimates are valued in the prices of the period in which the transaction takes place.

Changes in current-dollar GDP measure the changes in the market value of goods and services produced in the economy over a particular period. For many purposes, it is necessary to decompose these changes into quantity and price components. In general, the current-dollar values and price indexes for most GDP

6. Additional information about source data and assumptions is also available online through the Economic Bulletin Board and on the Internet (see the box "Alternative Media").

components are determined largely using data from Federal Government surveys, and the real values of these components are calculated by deflation at the most detailed level for which all the required data are available.[7]

Calculating real measures.—BEA prepares measures of real GDP and its components in a dollar-denominated form, designated "chained (1992) dollar estimates." For most series, these estimates are computed by multiplying the 1992 current-dollar value of GDP, or of a GDP component, by a corresponding quantity index number.[8] Changes in real output are "chained"

7. Two other methods used to calculate the real values for the most detailed GDP components: Quantity extrapolation and direct base-year valuation. For quantity extrapolation, the real values are obtained by extrapolating the base-year current-dollar estimates in both directions from the base period (1992) by quantity indicators, such as oilwell footage drilled. For direct base-year valuation, the real values are obtained by multiplying base-year prices by actual quantity data for each period; for example, base-year crop and livestock prices are multiplied by crop and livestock quantities in the current year.

8. The following "real" series continue to be calculated as the current-dollar value of the series divided by an appropriate implicit price deflator: The chained value of gross national income (table 1.10), gross domestic income (table 1.10), command-basis exports of goods and services and receipts of factor income (table 1.11), gross and net domestic product of nonfinancial corporate business (table 1.16), and disposable personal income (tables

Additional Information About the NIPA's

NIPA methodology papers

BEA has prepared a series of papers that provide detailed descriptions of NIPA concepts and methodologies. The methodologies described in these papers are subject to periodic improvements that are typically introduced as part of the annual and comprehensive revisions of the NIPA's. These improvements—which consist of definitional changes, new source data, and new estimating methods—are described in the SURVEY articles that cover these revisions. For example, see the articles listed in the section "Comprehensive revision of the NIPA's."

Photocopies of the methodology papers are available from the National Technical Information Service (NTIS); to order, write to U.S. Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, or call (703) 487–4650.

Methodology Paper No. 1: An Introduction to National Economic Accounting. (1985). 19 pp. $12.50 (NTIS Accession No. PB 85–247567).

Methodology Paper No. 2: Corporate Profits: Profits Before Tax, Profits Tax Liability, and Dividends. (1985). 67 pp. $27.00 (NTIS Accession No. PB 85–245397).

Methodology Paper No. 3: Foreign Transactions. (1987). 52 pp. $27.00 (NTIS Accession No. PB 88–100649).

Methodology Paper No. 4: GNP: An Overview of Source Data and Estimating Methods. (1987). 36 pp. $24.50 (NTIS Accession No. PB 88–134838). The source data and estimating methods are updated in tables accompanying articles on annual revisions, the most

recent of which appeared in the July 1994 SURVEY OF CURRENT BUSINESS; the availability of updated tables will be announced in a future issue.

Methodology Paper No. 5: Government Transactions. (1988). 120 pp. $31.50 (NTIS Accession No. PB 90–118480).

Methodology Paper No. 6: Personal Consumption Expenditures. (1990). 92 pp. $27.00 (NTIS Accession No. PB 90–254244).

Comprehensive revision of the NIPA's

The following is a list of articles in the SURVEY on the most recent comprehensive revision.

- "Preview of the Comprehensive Revision of the National Income and Product Accounts: BEA's New Featured Measures of Output and Prices," July 1995.

- "Preview of the Comprehensive Revision of the National Income and Product Accounts: Recognition of Government Investment and Incorporation of a New Methodology for Calculating Depreciation," September 1995.

- "Preview of the Comprehensive Revision of the National Income and Product Accounts: New and Redesigned Tables," October 1995.

- "Improved Estimates of the National Income and Product Accounts for 1959–95: Results of the Comprehensive Revision," January/February 1996.

(multiplied) together to form a time series that allows for the effects of changes in relative prices over time. For example, if a current-dollar GDP component equaled $100 in 1992 and if real output for this component increased by 10 percent in 1993, then the "chained (1992) dollar" value of this component

in 1993 would be $110 ($100 × 1.10). (For more details, see the box "Basic Formula for Calculating Chain-Type Real Output and Price Measures.") Generally, the percentage changes calculated from the chained (1992) dollar estimates and the percentage changes calculated from the quantity indexes are the same; any small differences that arise are due to rounding.

2.1 and 2.9). For the following series, real values are calculated as the difference between chained-dollar series: Change in business inventories (CBI) (tables 1.2, 1.4, 1.6, 5.3, 5.11, 8.5, 8.7, and 8.9); net exports (tables 1.2, 8.5, and 8.7); command-basis gross national product (table 1.11), foreign travel and other, net (table 2.5); net foreign travel (table 2.7); Federal consumption expenditures for other nondurable goods (table 3.8A); Federal consumption expenditures for durable goods, for nondurable goods, and for Commodity Credit Corporation (CCC) inventory change (table 3.8B); and Federal defense and nondefense net purchases of used structures (table 5.15). For CBI, real values are calculated as the difference between end-of-period and beginning-of-period chain-weighted stocks of inventories. For CCC inventory change, real values are calculated as the difference between additions to inventories (farmer forfeitures of commodities plus direct purchases by the CCC) and withdrawals from inventories (sales by the CCC).

The 1992–93 percent change in real GDP uses prices for 1992 and 1993 as weights. Similarly, the 1992–93 percent change in prices uses quantities for 1992 and 1993 as weights. Because the quantity and price index numbers calculated in this way are symmetric, the product of the change in real GDP and the change in prices approximately equals the change in current-

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Basic Formulas for Calculating Chain-Type Real Output and Price Measures

This box illustrates the basic calculations for chain-type real GDP output and price measures. The formula used to calculate the annual change in real GDP is a "Fisher Ideal" formula (Q_t^F) that uses weights for 2 adjacent years (years *t-1* and *t*).[1] The formula for the change in real GDP in year *t* relative to its value in year *t-1* is

$$Q_t^F = \sqrt{\frac{\sum p_{t-1} q_t}{\sum p_{t-1} q_{t-1}} \times \frac{\sum p_t q_t}{\sum p_t q_{t-1}}},$$

where the *p*'s and *q*'s represent prices and quantities in the 2 years.

Because the first term in the Fisher Ideal formula is a Laspeyres quantity index (Q_t^L), or

$$Q_t^L = \frac{\sum p_{t-1} q_t}{\sum p_{t-1} q_{t-1}},$$

and the second term is a Paasche quantity index (Q_t^P), or

$$Q_t^P = \frac{\sum p_t q_t}{\sum p_t q_{t-1}},$$

the Fisher formula can also be expressed for year *t* as the geometric mean of these indexes as follows:

$$Q_t^F = \sqrt{Q_t^L \times Q_t^P}.$$

The percent change in real GDP (or a GDP component) from year *t-1* to year *t* is calculated as

$$100(Q_t^F - 1.0).$$

Similarly, price indexes are calculated using the Fisher Ideal formula,

$$P_t^F = \sqrt{\frac{\sum p_t q_{t-1}}{\sum p_{t-1} q_{t-1}} \times \frac{\sum p_t q_t}{\sum p_{t-1} q_t}},$$

which is the geometric mean of a Laspeyres price index (P_t^L) and a Paasche price index (P_t^P), or

$$P_t^F = \sqrt{P_t^L \times P_t^P}.$$

The chain-type real output and price indexes are presented with the base year (*b*) equal to 100; that is, $I_b = 100$. In general, the quantity index value for period *t* is

$$I_t^F = I_{t-1}^F \times Q_t^F,$$

and the price index is calculated analogously.

The current-dollar change from year *t-1* to year *t* expressed as a ratio is $\sum p_t q_t / \sum p_{t-1} q_{t-1}$. It is equal to the product of the Fisher Ideal price and quantity indexes:[2]

$$\frac{\sum p_t q_t}{\sum p_{t-1} q_{t-1}} = \sqrt{\frac{\sum p_t q_{t-1}}{\sum p_{t-1} q_{t-1}} \times \frac{\sum p_t q_t}{\sum p_{t-1} q_t}} \times \sqrt{\frac{\sum p_{t-1} q_t}{\sum p_{t-1} q_{t-1}} \times \frac{\sum p_t q_t}{\sum p_t q_{t-1}}}.$$

The chained-dollar value (CD_t^F) is calculated by multiplying the index value by the base-period current-dollar value ($\sum p_b q_b$) and dividing by 100. For period *t*,

$$CD_t^F = \sum p_b q_b \times I_t^F / 100.$$

The implicit price deflator (IPD_t^F) for period *t* is calculated as the ratio of the current-dollar value to the corresponding chained-dollar value multiplied by 100 as follows:

$$IPD_t^F = \frac{\sum p_t q_t}{CD_t^F} \times 100.$$

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1. Only annual weights are used in the calculations, including those for monthly and quarterly changes in real measures. The formulas shown apply only to annual estimates. Modified formulas are used for calculating quarterly estimates (see text).

2. See text footnote 9.

dollar GDP.[9] However, because the calculations use weights that differ for each period, the corresponding chained-dollar estimates for the detailed GDP components usually do not **sum** to the chained-dollar value of GDP or to any intermediate aggregates. Most chained-dollar NIPA tables have a "residual" line that indicates the difference between GDP (or a major aggregate) and the sum of the most detailed components shown in that table. For periods close to the base period (1992), the residual is small. However, the residual tends to become larger as one moves further from the base period. Therefore, a table of contributions of the major components to the percent change in real GDP (NIPA table 8.2) is shown that provides a more precise decomposition of GDP growth than the tables showing the chained-dollar estimates.

In the most recent period (currently, for quarters beginning with the third quarter of 1994), only 1 year's information is available for computing the index number weights.[10] Accordingly, a single year's weights (currently 1994) are used, with the consequence that for these quarters, the product of the percentage changes in the price and quantity indexes does not necessarily equal the current-dollar change. However, another measure, the "implicit price deflator," has this property for all periods. The implicit price deflator, which is shown in the "Selected NIPA Tables" and in the GDP news releases, is calculated

as the ratio of the current-dollar value to the corresponding chained-dollar value multiplied by 100 (see the box "Basic Formulas for Calculating Chain-Type Real Output and Price Real Measures").

Quantity and price indexes and implicit price deflators for GDP and its major components are presented as index numbers in NIPA table 7.1, and percentage changes from the preceding period for these measures are presented in NIPA table 8.1. Table 8.2 presents the contributions of the major components to the change in real GDP.

Seasonal adjustment.—Quarterly and monthly NIPA estimates are seasonally adjusted when statistically significant seasonal patterns are present. Seasonal adjustment removes from the time series the average effect of variations that normally occur at about the same time and in about the same magnitude each year—for example, weather, holidays, and tax payment dates. After seasonal adjustment, cyclical and other short-term changes in the economy stand out more clearly.

Annual rates.—For quarters and months, NIPA estimates (except the indexes) are presented at annual rates. Annual rates show values for a quarter or a month at their annual equivalent (that is, the value that would be registered if the rate of activity measured for a month or a quarter were maintained for a full year). Annual rates make it easier to compare values for time periods of different lengths; for example, the rates for quarters can be compared with the rates for years. The annual rate of change (r) for two consecutive quarterly levels, GDP_{t-1} and GDP_t, is calculated as

$$r = ((GDP_t/GDP_{t-1})^4 - 1) \times 100.$$

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9. This relationship is valid when the changes are expressed as "relatives"; see, for example, the first equation in the box "Basic Formulas for Calculating Chain-Type Real Output and Price Measures." However, it does not hold exactly, because a special methodology is needed for estimating real change in business and Commodity Credit Corporation inventories. For quarterly estimates, the relationship also does not hold, because these estimates are adjusted independently for consistency with their corresponding annual estimates.

10. The annual estimates for 1995 are calculated as the average of the estimates for the four quarters.