

## Appendixes

### A. Additional Information About the NIPA Estimates

#### Statistical Conventions

Current-dollar GDP is a measure of the market value of goods, services, and structures that are produced in the economy in a particular period. The changes in current-dollar GDP can be decomposed into quantity and price components. Quantities, or “real” measures, and prices are expressed as index numbers with the reference year—at present, the year 2005—equal to 100.<sup>1</sup>

The annual changes in quantities and prices are calculated using a Fisher formula that incorporates weights from 2 adjacent years. For example, the annual percent change in real GDP for 2006–2007 uses prices for 2006 and 2007 as weights, and the 2006–2007 annual percent change in the GDP price index uses quantities for 2006 and 2007 as weights. Because the Fisher formula allows for the effects of changes in relative prices and in the composition of output over time, the resulting quantity or price changes are not affected by the substitution bias that is associated with changes in quantities and prices calculated using a fixed-weighted formula. These annual changes are “chained” (multiplied) together to form time series of quantity and price indexes. The percent changes in the Fisher indexes are not affected by the choice of the reference year.

BEA also publishes implicit price deflators (IPDs), which are calculated as the ratio of the current-dollar value of a component to the chained-dollar value of the component, multiplied by 100. The values of an IPD are very close to the values of the corresponding “chain-type” price index.

The measures of real GDP and its major components are also presented in dollar-denominated form, designated “chained (2005) dollar estimates.” For most series, these estimates are computed by multiplying the current-dollar value in 2005 by a corresponding quantity index number and then dividing by 100. For example, if a current-dollar GDP component equaled \$100 in 2005 and if real output for this component increased by 10 percent in 2006, then the chained (2005) dollar value of this component in 2006 would be \$110 (\$100 × 1.10). The percent changes calculated from the chained (2005) dollar estimates and from the quantity indexes are the same; any differences will be small and due to rounding.

The chained-dollar values for the detailed GDP components will not necessarily sum to the chained-dollar estimate of GDP (or to any intermediate aggregate) in a table, because the relative prices that are used as weights for any period other than the reference year differ from those of the reference year. A measure of the effect of such

differences is provided by a “residual” line—the difference between the chained-dollar value of the main aggregate in the table and the sum of the most detailed components in the table. For periods close to the reference year, when the relative prices that are used as weights have usually not changed much, the residuals tend to be small, and the chained-dollar estimates can be used to approximate the contributions to growth and to aggregate the detailed estimates. For periods further from the reference year, the residuals tend to be larger, and the chained-dollar estimates are less useful for analyses of contributions to growth. In particular, for components for which relative prices are changing rapidly, the calculation of contributions based on chained-dollar estimates may be misleading even just a few years from the reference year. Thus, contributions derived from quantity indexes provide a better measure than contributions derived from chained-dollar estimates; contributions based on quantity indexes are shown in selected NIPA tables 1.1.2, 1.2.2, 1.5.2, 2.3.2, 3.9.2, 4.2.2, and 5.3.2.

For quarters and months, NIPA estimates are presented at annual rates, which show the value that would be registered if the rate of activity that is measured for a quarter or for a month were maintained for a full year. Annual rates are used so that periods of different lengths—for example, quarters and years—may be more easily compared. These annual rates are determined simply by multiplying the estimated rate of activity by 4 (for quarterly data) or by 12 (for monthly data).

For most quarterly NIPA estimates, *percent changes* in the estimates are also expressed at annual rates. Calculating these *changes* requires a variant of the compound interest formula:

$$r = \left[ \left( \frac{x_t}{x_0} \right)^{m/n} - 1 \right] \times 100$$

where  $r$  is the percent change at an annual rate;  $x_t$  is the level of activity in the later period;  $x_0$  is the level of activity in the earlier period;  $m$  is the periodicity of the data (for example, 1 for annual data, 4 for quarterly data, or 12 for monthly data); and  $n$  is the number of periods between the earlier periods and the later periods (that is,  $t - 0$ ).

Quarterly and monthly NIPA estimates are seasonally adjusted if necessary. Seasonal adjustment removes from the time series the average effects 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.

1. See J. Steven Landefeld, Brent R. Moulton, and Cindy M. Vojtech, “Chained-Dollar Indexes: Issues, Tips on Their Use, and Upcoming Changes,” *SURVEY OF CURRENT BUSINESS* (November 2003): 8–16.

## Reconciliation Table

**Table 1. Relation of Net Exports of Goods and Services and Net Receipts of Income in the NIPAs to Balance on Goods and Services and Income in the ITAs**

[Billions of dollars]

	Line	2008	2009	Seasonally adjusted at annual rates					
				2009			2010		
				II	III	IV	I	II	III
<b>Exports of goods and services and income receipts, ITAs</b> .....	1	<b>2,594.5</b>	<b>2,159.0</b>	<b>2,080.4</b>	<b>2,162.9</b>	<b>2,305.7</b>	<b>2,400.7</b>	<b>2,454.9</b>	<b>2,501.4</b>
Less: Gold, ITAs .....	2	18.7	13.9	12.3	14.3	15.3	17.9	14.7	20.0
Statistical differences <sup>1</sup> .....	3	0.0	0.0	0.0	0.0	0.0	-7.8	-7.6	-7.6
Other items.....	4	1.6	1.5	1.5	1.5	1.3	2.0	2.3	2.0
Plus: Adjustment for grossing of parent/affiliate interest payments.....	5	10.1	8.0	9.2	7.2	7.1	6.2	6.6	7.7
Adjustment for U.S. territories and Puerto Rico .....	6	51.1	49.6	49.0	48.6	51.8	49.7	54.6	51.7
Services furnished without payment by financial intermediaries except life insurance carriers.....	7	8.3	7.0	7.0	6.6	6.6	7.0	7.3	6.3
<b>Equals: Exports of goods and services and income receipts, NIPAs</b> .....	8	<b>2,642.9</b>	<b>2,208.2</b>	<b>2,131.9</b>	<b>2,209.5</b>	<b>2,354.6</b>	<b>2,451.5</b>	<b>2,514.0</b>	<b>2,552.8</b>
<b>Imports of goods and services and income payments, ITAs</b> .....	9	<b>3,167.4</b>	<b>2,412.5</b>	<b>2,297.1</b>	<b>2,418.4</b>	<b>2,584.3</b>	<b>2,697.9</b>	<b>2,815.2</b>	<b>2,874.7</b>
Less: Gold, ITAs .....	10	12.5	8.8	8.4	8.8	10.9	9.7	11.8	10.3
Statistical differences <sup>1</sup> .....	11	0.0	0.0	0.0	0.0	0.0	-4.9	-6.1	-6.1
Other items.....	12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plus: Gold, NIPAs.....	13	-4.1	-5.1	-4.8	-5.2	-5.8	-6.2	-4.2	-6.3
Adjustment for grossing of parent/affiliate interest payments.....	14	10.1	8.0	9.2	7.2	7.1	6.2	6.6	7.7
Adjustment for U.S. territories and Puerto Rico .....	15	35.0	34.8	37.2	32.4	34.2	40.1	38.7	36.6
Imputed interest paid to rest of world.....	16	8.3	7.0	7.0	6.6	6.6	7.0	7.3	6.3
<b>Equals: Imports of goods and services and income payments, NIPAs</b> .....	17	<b>3,306.8</b>	<b>2,448.3</b>	<b>2,337.3</b>	<b>2,450.6</b>	<b>2,615.5</b>	<b>2,740.2</b>	<b>2,857.9</b>	<b>2,914.9</b>
<b>Balance on goods and services and income, ITAs (1-9)</b> .....	18	<b>-572.9</b>	<b>-253.5</b>	<b>-216.7</b>	<b>-255.5</b>	<b>-278.6</b>	<b>-297.2</b>	<b>-360.3</b>	<b>-373.3</b>
Less: Gold (2-10+13).....	19	2.1	0.0	-0.9	0.3	-1.4	2.0	-1.3	3.4
Statistical differences (3-11) <sup>1</sup> .....	20	0.0	0.0	0.0	0.0	0.0	-2.9	-1.5	-1.5
Other items (4-12).....	21	1.6	1.5	1.5	1.5	1.3	2.0	2.3	2.0
Plus: Adjustment for U.S. territories and Puerto Rico (6-15).....	22	16.1	14.8	11.8	16.2	17.6	9.6	15.9	15.1
<b>Equals: Net exports of goods and services and net receipts of income, NIPAs (8-17)</b> .....	23	<b>-663.9</b>	<b>-240.1</b>	<b>-205.4</b>	<b>-241.1</b>	<b>-260.9</b>	<b>-288.7</b>	<b>-343.9</b>	<b>-362.1</b>

1. Consists of statistical revisions to the ITAs that have not yet been incorporated into the NIPAs.  
ITAs International transactions accounts  
NIPAs National income and product accounts