Annual Revision of the U.S. International Transactions Accounts

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IN JUNE 2016, the Bureau of Economic Analysis (BEA) released annual revisions of the U.S. international transactions accounts (ITAs) and the U.S. international investment position (IIP) accounts.[1] Through annual revisions, BEA introduces newly available and revised source data and new definitions, classifications, methodologies, and presentations. Together, these changes improve the accuracy and consistency of the statistics, address important developments in the U.S. economy and in foreign economies, and bring BEA's statistics into closer alignment with international statistical guidelines for compiling balance of payments and IIP statistics, including the International Monetary Fund's *Balance of Payments and International Investment Position Manual, Sixth Edition* (*BPM6*).[2]

In this annual revision, quarterly and annual statistics on U.S. international transactions were revised to incorporate newly available and revised source data and updated seasonal factors for 2013–2015 and for additional years for selected series. In addition, BEA incorporated newly available source data from benchmark surveys of foreign direct investment in the United States and of financial services transactions between U.S. financial services providers and foreign persons. BEA also implemented a refined methodology for estimating exports and imports of travel services and a refined methodology for estimating transactions in foreign-currency denominated financial instruments. Appendix A provides a numerical summary of the revisions; for a comparison of this year's revisions with past annual revisions, see the box "2016 Annual Revision in Historical Context" on page 3. Revised statistics on the detailed components of the ITAs are presented in "U.S. International Transactions Tables" that accompanies this article.

Revisions due to newly available and revised source data were mostly accounted for by the following:

- Goods exports and imports for 2013–2015 were revised to reflect revised source data from the U.S. Census Bureau, primarily resulting from improved coverage of imports that are valued below the filing exemption level.
- Services exports and imports for 2013–2015 were revised to reflect newly available and revised source data from BEA's quarterly surveys of international services transactions and the results of BEA's 2014 Benchmark Survey of Financial Services Transactions between U.S. Financial Services Providers and Foreign Persons. For travel and transport, exports were revised to reflect newly available and revised data from U.S. Customs and Border Protection on the number of foreign residents traveling in the United States.
- Financial asset and liability transactions and primary income receipts and payments related to inward direct investment for 2012–2015 were revised to incorporate the results of BEA's 2012 Benchmark Survey of Foreign Direct Investment in the United States and newly available and revised data from BEA's quarterly and annual direct investment surveys. Financial asset and liability transactions and primary income receipts and payments related to outward direct investment for 2013–2015 were also revised to incorporate newly available and revised data from BEA's quarterly and annual direct investment surveys.
- Financial asset and liability transactions and primary income receipts and payments related to portfolio investment and other investment for 2012–2015 were revised to incorporate newly available and revised source data from the U.S. Department of the Treasury.

Changes in methodology include the following:

- Exports and imports of services for 2013–2015 were revised to incorporate a refined methodology for estimating average expenditures by U.S. travelers abroad and foreign travelers in the United States.
- Transactions in other investment assets and liabilities and in portfolio investment assets and liabilities for 2012–2015 were revised to incorporate an

1. For a discussion of the revisions to the IIP accounts, see Elena L. Nguyen, "The International Investment Position of the United States at the End of the First Quarter of 2016 and 2015" in this issue of the SURVEY OF CURRENT BUSINESS.

2. *Balance of Payments and International Investment Position Manual, Sixth Edition* (Washington, DC: International Monetary Fund, 2009).

improved methodology for estimating transactions in foreign-currency denominated loans, deposits, negotiable certificates of deposit (NCDs), and short-term securities.

Generally, this annual revision has not altered the overall picture of recent U.S. international transactions, but certain revisions are notable. The largest revisions to the current-account deficit were downward revisions of $21.1 billion for 2015 and of $10.3 billion for 2013 (table A, chart 1). The largest revisions to net borrowing, as measured by financial-account transactions, were an upward revision of $47.7 billion for 2014 and a downward revision of $14.0 billion for 2015. Although the revision to net borrowing for 2014 was relatively large, the revised statistics do not alter the direction of change in net borrowing for the revised years (chart 2).

The next section of this article discusses the changes in methodology and major source data revisions. The final section summarizes the effect of the revisions on the current account, the financial account, and the statistical discrepancy of the ITAs.

Table A. Revisions to Current-Account and Capital-Account Balances, Net Lending or Borrowing From Financial-Account Transactions, and the Statistical Discrepancy, 2012–2015

[Billions of dollars]

	2012	2013	2014	2015
Balance on current account (line 101)				
Revised	–446.5	–366.4	–392.1	–463.0
Previously published	–449.7	–376.8	–389.5	–484.1
Amount of revision	3.1	10.3	–2.5	21.1
Balance on goods and services (line 102)				
Revised	–536.8	–461.9	–490.2	–500.4
Previously published	–536.8	–478.4	–508.3	–539.8
Amount of revision	0.0	16.5	18.1	39.4
Balance on primary income (line 105)				
Revised	215.8	219.0	224.0	182.4
Previously published	212.2	224.5	238.0	191.3
Amount of revision	3.6	–5.6	–14.0	–8.9
Balance on secondary income (line 106)				
Revised	–125.5	–123.5	–125.9	–145.0
Previously published	–125.1	–122.9	–119.2	–135.6
Amount of revision	–0.5	–0.6	–6.7	–9.3
Balance on capital account (line 107)				
Revised	6.9	–0.4	(*)	(*)
Previously published	6.9	–0.4	(*)	(*)
Amount of revision	0.0	0.0	(*)	(*)
Net lending (+) or net borrowing (–) from financial-account transactions (line 109)				
Revised	–440.5	–391.0	–287.4	–195.2
Previously published	–441.2	–395.8	–239.6	–209.2
Amount of revision	0.7	4.8	–47.7	14.0
Statistical discrepancy (line 100)				
Revised	–0.9	–24.2	104.7	267.8
Previously published	1.5	–18.7	149.9	274.9
Amount of revision	–2.4	–5.5	–45.2	–7.1

(*) A nonzero value between –$50,000,000 and $50,000,000
NOTE. Line numbers refer to ITA table 1.2.

Chart 1. Current-Account Deficit, 1999–2015

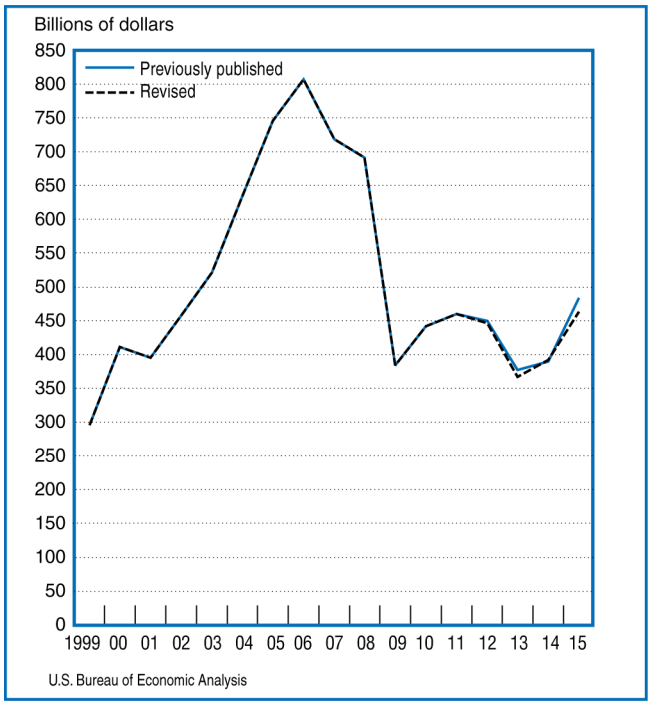
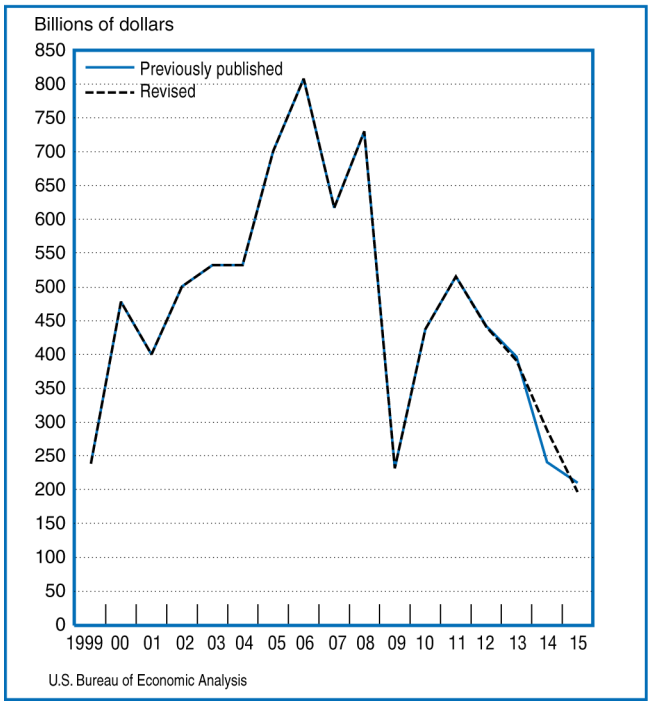


Chart 2. Net Borrowing From Financial-Account Transactions, 1999–2015



2016 Annual Revision in Historical Context

The 2016 annual revision represents the first annual revision of statistics for 2015, the second annual revision of statistics for 2014, and the third annual revision of statistics for 2013. As a percentage of trend gross domestic product, revisions to both the annual and quarterly statistics are generally similar or smaller than most first, second, and third annual revisions that were released in 2000–2015 (for statistics for 1999–2014), with the notable exception of revisions to statistics on services exports.[1] As shown in table I, first, second, and third mean absolute revisions (MARs) in the quarterly statistics along with the MARs in the annual statistics for the current-account balance and net lending/borrowing from financial-account transactions are smaller than their comparable MARs from past years. (In this table, a "ratio" value less than one indicates that the 2016 revisions are smaller than average annual revisions in past years.)

Geometric means of MARs ratios are shown in table II for some of the main aggregates and balances. For instance, the value of 0.58 for the balance on current account in the first column is the geometric mean of 0.54, 0.42, and 0.84 from the third column of table I. Revisions to services exports were larger than previous periods, mainly reflecting the incorporation of the 2014 Benchmark Survey of Financial Services Transactions between U.S. Financial Services Providers and Foreign Persons, improvements in the travel services estimation methodology, and newly available and revised source data for travel and transport services exports.[2] Revisions of the highest level aggregates–exports of goods and services and income receipts, imports of goods and services and income payments, and the balance on current account–are similar to historical averages whether or not revisions from earlier years are calculated excluding the changes in classifications and definitions introduced with the 2014 comprehensive restructuring.[3] Some of the more disaggregated series, such as the balance on services and the balance on goods and services, display higher revisions due to the revisions to services exports.

1. Trend GDP was derived using a Hodrick-Prescott filter to separate out the quarter-to-quarter deviations from the time series trend. For additional information on trend GDP calculation, see footnote 30 of "An Analysis of Revisions to BEA's International Economic Accounts" SURVEY OF CURRENT BUSINESS 92 (November 2012).

2. For additional information on these major sources of revision, see pages 4–6 of this article.

3. For example, before the comprehensive restructuring, "exports of goods and services and income receipts" excluded secondary income, a category previously shown only on a net basis (receipts less payments) as "unilateral current transfers." The revisions to balances, however, were unaffected by the increased recording of gross transactions. For more information, see Jeffrey R. Bogen, Mai-Chi Hoang, Kristy L. Howell, and Erin M. Whitaker "Comprehensive Restructuring and Annual Revision of the U.S. International Transactions Accounts," SURVEY OF CURRENT BUSINESS 94 (July 2014).

I. Comparison of Revisions From the 2016 Annual Revision With Revisions From Previous Annual Revisions

	MARs from the 2016 annual revision	MARs from previous annual revisions	Ratio[1]
Balance on current account			
Quarterly statistics			
2013[2]	0.062	0.116	0.54
2014[3]	0.062	0.147	0.42
2015[4]	0.130	0.154	0.84
Annual statistics			
2013[2]	0.062	0.092	0.67
2014[3]	0.015	0.124	0.12
2015[4]	0.118	0.139	0.85
Net lending or borrowing from financial-account transactions			
Quarterly statistics			
2013[2]	0.142	0.482	0.30
2014[3]	0.552	0.660	0.84
2015[4]	0.519	0.694	0.75
Annual statistics			
2013[2]	0.029	0.389	0.07
2014[3]	0.276	0.297	0.93
2015[4]	0.078	0.419	0.19

MARs Mean absolute revisions
1. Ratio is MAR from the 2016 annual revision divided by MAR from previous annual revisions.
2. Revisions to statistics on transactions for 2013 are compared with third annual revisions in 2002–2015.
3. Revisions to statistics on transactions for 2014 are compared with second annual revisions in 2001–2015.
4. Revisions to statistics on transactions for 2015 are compared with first annual revisions in 2000–2015.
NOTE. All revisions are computed as a percentage of trend current-dollar gross domestic product.

II. Ratios of the Revisions From the 2016 Annual Revision to Revisions From the Previous Annual Revisions

[Geometric mean of ratios of MARs[1]]

	Excluding changes in definitions from June 2014 comprehensive restructuring		Including changes in definitions from June 2014 comprehensive restructuring	
	Quarterly statistics	Annual statistics	Quarterly statistics	Annual statistics
Exports of goods and services and income receipts	1.11	1.20	0.84	0.88
Goods exports	0.82	0.12	0.82	0.12
Services exports	3.83	4.25	3.71	4.01
Primary income receipts	0.15	0.02	0.15	0.02
Imports of goods and services and income payments	0.88	0.79	0.44	0.35
Goods imports	1.07	0.28	1.07	0.28
Services imports	0.55	0.54	0.51	0.50
Primary income payments	0.75	0.73	0.73	0.70
Net U.S acquisition of financial assets excluding financial derivatives	0.73	0.24	0.71	0.23
Net U.S. incurrence of liabilities excluding financial derivatives	0.59	0.30	0.56	0.30
Balance on goods	0.79	0.68	0.79	0.68
Balance on services	3.97	4.76	3.98	4.76
Balance on goods and services	2.75	4.53	2.75	4.53
Balance on primary income	0.59	0.45	0.59	0.45
Balance on secondary income	0.70	1.00	0.70	1.00
Balance on current account	0.58	0.41	0.58	0.41
Net lending/borrowing from financial account	0.57	0.23	0.57	0.23

MARs Mean absolute revisions
1. Geometric mean computed over three ratios: (1) ratio of MARs of statistics for 2015 to MARs from other first annual revisions; (2) ratio of MARs of statistics for 2014 to MARs from other second annual revisions; (3) ratio of MARs of statistics for 2013 to MARs from other third annual revisions.

Changes in Methodology and Major Source Data Revisions

Improved methodology and newly available and revised source data for travel services. The travel accounts of the ITAs record expenditures on goods and services by foreign residents visiting the United States (U.S. exports) and by U.S. residents visiting other countries (U.S. imports). They include both business and personal travel. In 2015, travel-related expenditures accounted for 26 percent of total trade in services (U.S. exports plus U.S. imports).

Combined, other business travel and other personal travel compose a subaggregate measure of "travel (for all purposes including education)" that excludes both expenditures by travelers whose primary purpose for travel is education or health and expenditures by border, seasonal, and other short-term workers. In 2015, other business travel and other personal travel together accounted for 77 percent of U.S. travel exports and for more than 90 percent of U.S. travel imports (see ITA table 3.1, lines 12–19 and 55–62).

For all countries other than Canada and Mexico and excluding cruise-related travel expenditures, this subaggregate component of the travel account is derived by multiplying the number of travelers by a measure of their average expenditures.[3] The number of travelers is obtained from the National Travel and Tourism Office (NTTO) of the International Trade Administration in the U.S. Department of Commerce and is based on data collected by the U.S. Customs and Border Protection (CBP) of the U.S. Department of Homeland Security. Average expenditures are based on data obtained from the Survey of International Air Travelers (SIAT), conducted by NTTO. The number of travelers and SIAT expenditure data include the country of residence for foreign travelers to the United States and countries of destination for U.S. travelers abroad. The subaggregate component of the travel account is allocated either to other business travel or other personal travel using information from the SIAT.

Beginning with statistics for 2013, BEA refined its methodology for estimating average expenditures for other business and other personal travel exports and imports for countries other than Canada and Mexico. Previously, BEA estimated average expenditures by individual country or by country group from expenditures reported on the SIAT. For countries with smaller sample sizes, expenditures were averaged over time or across similar countries. With this annual revision, BEA has introduced an improved method based on a moving average of the quarterly estimates used previously for estimating average expenditures. This approach is less influenced by data variability introduced by small sample sizes and by survey sample outliers. BEA has also incorporated revised source data for other business and other personal travel exports. Source data on the number of foreign travelers to the United States collected by CBP were revised to incorporate two improvements related to CBP's implementation of the automated collection of travel documents from foreign visitors entering the United States in 2013.[4]

Beginning with statistics for 2013, the number of foreign travelers was revised to cover travelers whose country of residence was not collected under CBP's automated collection of travel documents. Previously, BEA excluded travelers with missing countries of residence in its estimates of other business and other personal travel exports because the number of travelers for whom the country of residence was missing was not significant until 2015. For 2014 and 2015, the source data BEA received from NTTO were revised to replace a traveler's missing country of residence with the traveler's country of citizenship. For 2013, BEA estimated the country of residence for those travelers missing a country of residence based on country shares used for 2014.

Beginning with statistics for 2014, BEA incorporated data into the travel estimates on the number of foreign travelers entering the United States who stay for only one night. Although international statistical standards, including *BPM6*, call for U.S. travel exports to include expenditures regardless of length of stay by all visitors who maintain a substantial economic interest in an economy other than the United States, past source data limitations led to the exclusion of travelers who stay for only one night. CBP's implementation of the automated collection of travel documents has led to a more accurate accounting of visitors who stay for only one night, and, as a result, BEA was able to include these travelers in the source data that BEA uses to estimate other business and other personal travel exports.

Newly available and revised source data for air passenger transport exports. Air passenger transport exports measure payments by foreign residents to U.S. air carriers for transportation to and from the United States and between two foreign countries. BEA compiles air passenger transport statistics for countries and areas other than Canada by multiplying data on the

3. Statistics for Canada and Mexico are based on data provided to BEA by Statistics Canada and the Bank of Mexico. Statistics for travel by cruise are based on data from the Department of Homeland Security and several private sources.

4. More information on both of these revisions to source data is available from the National Travel and Tourism Office.

number of travelers by estimates of average air fares.[5] The number of travelers is from NTTO, based on data collected by CBP. Average fares are based on information from the SIAT. BEA revised its estimates of air passenger transport exports by incorporating the revised CBP data on the number of travelers described above.

Improved methodology for the measurement of transactions in selected foreign-currency denominated financial instruments. BEA has improved the method for estimating financial transactions in foreign-currency denominated loans, deposits, NCDs, and short-term securities for which the currency composition of asset and liability positions underlying the transactions is not available in BEA's source data. Foreign-currency denominated positions account for approximately 10 percent of total asset positions, and for approximately 5 percent of total liability positions, in these instruments at year-end 2015.

BEA derives transactions in these instruments from U.S. asset and liability positions that are reported in the Treasury International Capital (TIC) B-form and C-form.[6] Quarterly transactions in assets are derived as the value of assets reported at the end of a quarter, less the value of assets reported at the start of the quarter, less changes in the value of assets not due to transactions, including changes in exchange rates.[7] Quarterly transactions in liabilities are derived in the same manner.

Changes in the value of asset and liability positions caused by changes in exchange rates ("exchange-rate changes in positions") must be estimated and excluded from the total change in positions to derive transactions. Excluding exchange-rate changes in positions would be relatively straightforward if the complete currency composition of positions was provided in the TIC source data (see equation (1) in Appendix B "Details on Methodology for Measuring Transactions in Selected Foreign-Currency Denominated Financial Instruments").[8] TIC data include the currency composition for an aggregate set of loans, deposits, NCDs, and short-term securities, but not for each of these instruments separately.

To estimate transactions and exchange-rate changes in position by instrument, BEA allocates transactions and exchange-rate changes for the aggregate set of instruments to each individual instrument. BEA's previous methodology allocated transactions and exchange-rate changes for the aggregate set of instruments to each instrument using a ratio of change in position for the instrument to change in position for the aggregate set of all instruments. The previous methodology at times yielded exchange-rate changes for individual instruments that were notably different from actual changes in exchange rates. The improved methodology instead allocates the exchange-rate change for the aggregate set of instrument to each individual instrument using a ratio of the position for the instrument to the position for the aggregate set. This methodology yields more tenable changes in positions due to exchange-rate changes, and consequently, more accurate transactions estimates. For more information on this improvement, see Appendix B.

BEA also expanded the number of exchange rates used for estimating transactions to make the estimation process more representative of positions included in the TIC B-form and C-form data. Previously, BEA used exchange rates between the U.S. dollar and currencies for which positions data are separately provided in the source data: the Canadian dollar, the euro, the British pound, the Japanese yen, and, beginning in December 2013, the Swiss franc. In addition, the Special Drawing Right (SDR) exchange rate was used as a proxy to estimate the impact of the change in exchange rates on positions not denominated in the other five currencies.[9] The improved methodology replaces the SDR exchange rate with exchange rates of the currencies of Australia, Brazil, China, Denmark, Hong Kong, India, Malaysia, Mexico, New Zealand, Norway, Singapore, South Africa, South Korea, Sri Lanka, Sweden, Taiwan, Thailand, and Venezuela. Positions for these countries are provided in the source data, but the particular mix of positions in the 18 currencies is unknown. The country distribution of positions is used to proxy the currency mix of positions. The use of the 18 exchange rates provides more accurate estimates of transactions in the financial account by instrument and by country and area because they better represent the foreign-currency denominated positions that are in the reported data.

Incorporation of results from benchmark surveys. BEA collects information on direct investment and international trade in services through mandatory surveys of U.S. companies. In addition to quarterly and

5. For travel to and from Canada, BEA uses data provided by Statistics Canada.

6. For more information, see *U.S. International Economic Accounts; Concepts and Methods*: 13-5–13-9 and the home page for the Treasury International Capital reporting system.

7. See *U.S. International Economic Accounts: Concepts and Methods*: 10-57–10-58 and 10-6–10-71.

8. For more information on the method used for the estimation of transactions and exchange-rate changes from holdings with known currency composition see *Balance of Payments and International Investment Position Manual, 6th Edition* (BPM6), paragraphs: 9.25–9.28.

9. Special Drawing Rights (SDRs) are international reserve assets created by the IMF and allocated to members to supplement existing official reserves. SDR holdings represent unconditional rights to obtain foreign exchange or other reserve assets from other IMF members. The value of the SDR is currently based on a basket of four major currencies: the U.S. dollar, euro, the Japanese yen, and pound sterling.

annual surveys, which are used to collect information from a sample of companies whose transactions or positions are covered in the relevant ITA or IIP accounts, BEA also conducts benchmark surveys every 5 years to collect information from the universe of such companies.

Investment positions, transactions in financial assets and liabilities, and related income receipts and payments for 2012–2015 were revised to incorporate the results of BEA's 2012 Benchmark Survey of Foreign Direct Investment in the United States. This benchmark survey covers all U.S. resident entities that are foreign owned.

Financial services exports and imports for 2013–2015 were revised to incorporate the results of BEA's 2014 Benchmark Survey of Financial Services Transactions between U.S. Financial Services Providers and Foreign Persons. This benchmark survey covers all U.S. financial services providers that have sales to, or purchases from, foreign persons. The number of responses to this benchmark survey increased substantially from the previous benchmark survey conducted in 2009. The 2014 survey captured the transactions of a significant number of new reporters—primarily investment managers and hedge funds—that were not previously in BEA's universe. Because these new companies were not previously in the universe, BEA estimated transactions for these companies for 2013.

Effects of the Revisions

Current-account highlights

Current-account statistics were revised for 2012–2015 (tables A, B, and C) to incorporate newly available and revised source data, updated seasonal factors, and a refined methodology for estimating travel services. The current-account deficit was revised downward $3.1 billion for 2012, $10.3 billion for 2013, and $21.1 billion for 2015. It was revised upward $2.5 billion for 2014. The revised statistics for all years display the same trend in the current-account deficit as the previously published statistics.

The revisions to most quarterly statistics did not affect the direction of the quarter-to-quarter changes in the current-account deficit (chart 3). For most quarters of 2012–2015, the revisions also did not significantly affect the magnitude of the quarter-to-quarter changes in the current-account deficit. The largest revision to the quarter-to-quarter change was for the first quarter of 2015 when the increase in the deficit was revised downward $8.1 billion.

Goods and services. The deficit on goods and services was revised downward $16.5 billion for 2013, $18.1 billion for 2014, and $39.4 billion for 2015. The revised statistics show the same trend as the previously published statistics.

The deficit on goods was revised downward $0.3 billion for 2013; it was revised upward $10.7 billion for 2014 and $3.3 billion for 2015. The revisions to exports and imports of goods primarily reflect revised source data from the U.S. Census Bureau. For 2014, the revision to goods imports primarily reflects improved

Table B. Revisions to Selected Current-Account Transactions, 2012–2015

[Billions of dollars]

	2012	2013	2014	2015
Exports of goods and services and income receipts (line 1)				
Revised	3,097.1	3,214.8	3,338.8	3,172.7
Previously published	3,098.1	3,201.3	3,306.6	3,138.7
Amount of revision	–1.0	13.5	32.2	34.0
Exports of goods (line 3)				
Revised	1,562.6	1,592.0	1,633.3	1,510.3
Previously published	1,562.6	1,592.0	1,632.6	1,513.5
Amount of revision	0.0	(*)	0.7	–3.1
Exports of services (line 13)				
Revised	656.4	701.5	743.3	750.9
Previously published	656.4	687.9	710.6	710.2
Amount of revision	0.0	13.6	32.7	40.7
Transport (line 15)				
Revised	83.9	86.8	90.7	87.2
Previously published	83.9	87.4	90.0	84.2
Amount of revision	0.0	–0.6	0.7	3.0
Travel (for all purposes including education)[1] (line 16)				
Revised	161.6	177.5	191.3	204.5
Previously published	161.6	172.9	177.2	178.3
Amount of revision	0.0	4.6	14.1	26.2
Financial services (line 18)				
Revised	76.7	95.1	107.7	102.5
Previously published	76.7	84.1	87.3	86.3
Amount of revision	0.0	11.0	20.4	16.2
Primary income receipts (line 23)				
Revised	769.0	794.7	821.8	782.9
Previously published	769.5	794.8	823.4	783.1
Amount of revision	–0.5	–0.1	–1.5	–0.2
Secondary income receipts (line 30)				
Revised	109.1	126.7	140.4	128.6
Previously published	109.6	126.6	140.0	132.0
Amount of revision	–0.5	0.1	0.4	–3.4
Imports of goods and services and income payments (line 31)				
Revised	3,543.6	3,581.2	3,730.8	3,635.7
Previously published	3,547.7	3,578.0	3,696.1	3,622.8
Amount of revision	–4.1	3.2	34.7	12.9
Imports of goods (line 33)				
Revised	2,303.7	2,294.2	2,385.5	2,272.9
Previously published	2,303.7	2,294.6	2,374.1	2,272.8
Amount of revision	0.0	–0.4	11.4	0.1
Imports of services (line 42)				
Revised	452.0	461.1	481.3	488.7
Previously published	452.0	463.7	477.4	490.6
Amount of revision	0.0	–2.6	3.8	–2.0
Travel (for all purposes including education)[1] (line 45)				
Revised	100.3	98.1	105.5	112.9
Previously published	100.3	104.1	110.8	120.5
Amount of revision	0.0	–6.0	–5.3	–7.6
Financial services (line 47)				
Revised	16.7	21.5	24.9	25.2
Previously published	16.7	18.5	19.5	20.1
Amount of revision	0.0	3.0	5.4	5.0
Primary income payments (line 52)				
Revised	553.2	575.7	597.8	600.5
Previously published	557.3	570.2	585.4	591.8
Amount of revision	–4.1	5.5	12.4	8.8
Secondary income payments (line 58)				
Revised	234.7	250.2	266.3	273.6
Previously published	234.7	249.5	259.2	267.6
Amount of revision	0.0	0.7	7.1	6.0

(*) A nonzero value between –$50,000,000 and $50,000,000

NOTE. Line numbers refer to ITA table 1.2.

1. All travel purposes include 1) business travel, including expenditures by border, seasonal, and other short-term workers and 2) personal travel, including health-related and education-related travel.

coverage of imports that are valued below the filing exemption level (low-value imports).[10]

The surplus on services was revised upward $16.2 billion for 2013, $28.9 billion for 2014, and $42.7 billion for 2015. The revisions to exports and imports of services primarily reflect newly available and revised source data from BEA's surveys of international services transactions, including the 2014 Benchmark Survey of Financial Services Transactions between U.S. Financial Services Providers and Foreign Persons, a refined methodology for estimating average expenditures of foreign travelers, and newly available and revised source data for travel services and air passenger transport exports.

Primary income. The surplus on primary income was revised upward $3.6 billion for 2012. It was revised downward $5.6 billion for 2013, $14.0 billion for 2014, and $8.9 billion for 2015. The revisions reflect newly available and revised source data from BEA's direct investment surveys, including the 2012 Benchmark Survey of Foreign Direct Investment in the United States, and from the U.S. Department of the Treasury's Treasury International Capital (TIC) surveys.[11]

Secondary income. The deficit on secondary income (current transfers) was revised upward $0.5 billion for 2012, $0.6 billion for 2013, $6.7 billion for 2014, and $9.3 billion for 2015. The revisions to secondary income primarily reflect newly available and revised source data on U.S. government transfers and private transfers from several sources, including the U.S. Department of Defense, the U.S. Agency for International Development, and the U.S. Internal Revenue Service.

10. Prior to 2015, low-value imports omitted certain shipments filed in the Automated Commercial Environment (ACE). With this annual revision, BEA incorporated revised statistics from the Census Bureau that include these previously omitted shipments.

Table C. Sources of Revisions for Selected Current-Account Transactions, 2012–2015

[Billions of dollars]

	2012	2013	2014	2015
Exports of goods (line 3)	**0.0**	**(*)**	**0.7**	**–3.2**
Newly available and revised source data	0.0	(*)	0.7	–3.2
Exports of services (line 13)	**0.0**	**13.6**	**32.7**	**40.7**
Refined methodology and newly available and revised source data for travel	0.0	4.4	13.8	24.1
Newly available and revised source data for air passenger transport	0.0	–0.6	0.6	3.1
Other newly available and revised source data	0.0	9.8	18.3	13.5
Primary income receipts (line 23)	**–0.5**	**–0.1**	**–1.5**	**–0.2**
Newly available and revised source data	–0.5	–0.1	–1.5	–0.2
Secondary income receipts (line 30)	**–0.5**	**0.1**	**0.4**	**–3.4**
Newly available and revised source data	–0.5	0.1	0.4	–3.4
Imports of goods (line 33)	**0.0**	**–0.4**	**11.4**	**0.1**
Newly available and revised source data	0.0	–0.4	11.4	0.1
Imports of services (line 42)	**0.0**	**–2.6**	**3.8**	**–2.0**
Refined methodology and newly available and revised source data for travel	0.0	–6.0	–5.8	–6.8
Newly available and revised source data	0.0	3.4	9.6	4.9
Primary income payments (line 52)	**–4.1**	**5.5**	**12.4**	**8.8**
Newly available and revised source data	–4.1	5.5	12.4	8.8
Secondary income payments (line 58)	**0.0**	**0.7**	**7.1**	**6.0**
Newly available and revised source data	0.0	0.7	7.1	6.0
Balance on current account (line 101)	**3.1**	**10.3**	**–2.5**	**21.1**
Refined methodology and newly available and revised source data for travel	0.0	10.4	19.6	30.9
Newly available and revised source data for air passenger transport	0.0	–0.6	0.6	3.1
Other newly available and revised source data	3.1	0.6	–22.7	–12.9
Balance on goods and services (line 102)	**0.0**	**16.5**	**18.1**	**39.4**
Refined methodology and newly available and revised source data for travel	0.0	10.4	19.6	30.9
Newly available and revised source data for air passenger transport	0.0	–0.6	0.6	3.1
Other newly available and revised source data	0.0	6.7	–2.0	5.3
Balance on primary income (line 105)	**3.6**	**–5.6**	**–14.0**	**–8.9**
Newly available and revised source data	3.6	–5.6	–14.0	–8.9
Balance on secondary income (line 106)	**–0.5**	**–0.6**	**–6.7**	**–9.3**
Newly available and revised source data	–0.5	–0.6	–6.7	–9.3

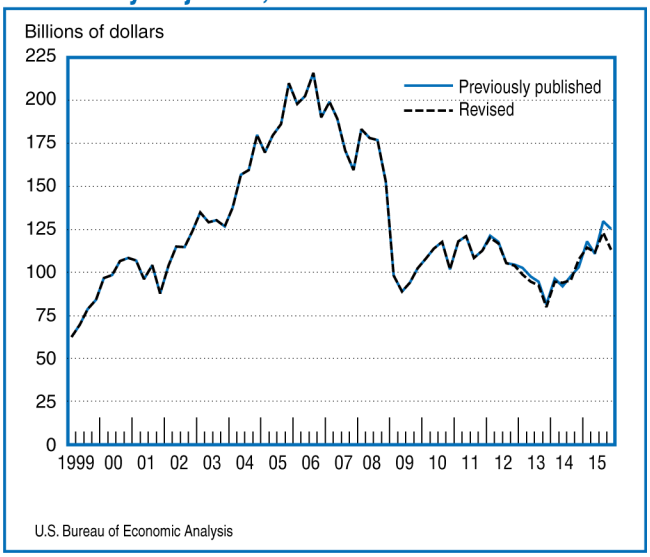
(*) A nonzero value between –$50,000,000 and $50,000,000
NOTE. Line numbers refer to ITA table 1.2.

Financial-account highlights

Financial-account statistics for 2012–2015 were revised to incorporate newly available and revised source data and a refined methodology for measuring foreign-currency denominated transactions. Net borrowing was revised downward $0.7 billion for 2012, $4.8 billion for 2013, and $14.0 billion for 2015 (tables A and D); it was revised upward $47.7 billion for 2014. Revisions to net borrowing reflect the combined revisions to net U.S. acquisition of financial assets excluding financial derivatives, net U.S. incurrence of

11. Statistics for portfolio investment income and for other investment income are based partly on resident-nonresident transactions and positions collected monthly and quarterly on the TIC Surveys, as explained in *U.S. International Economic Accounts: Concepts and Methods.*

Chart 3. Quarterly Current-Account Deficit, Seasonally Adjusted, 1999–2015



liabilities excluding financial derivatives, and net transactions in financial derivatives. The downward revisions to net borrowing for 2012 and 2013 reflect upward revisions for each year to net U.S. acquisition of financial assets excluding financial derivatives that exceeded upward revisions for each year to net U.S. incurrence of liabilities excluding financial derivatives. The upward revision to net borrowing for 2014 reflects an upward revision to net U.S. incurrence of liabilities excluding financial derivatives that exceeds an upward revision to net U.S. acquisition of financial assets excluding financial derivatives. The downward revision to net borrowing for 2015 reflects a downward revision to net U.S. incurrence of liabilities excluding financial derivatives that exceeds a downward revision to net U.S. acquisition of financial assets excluding financial derivatives. The revised annual financial flows for each account are similar in size and direction to the previously published financial flows.

The volatility in quarterly net lending or net borrowing in financial-account transactions reflects the volatility in global financial markets as well as possible incomplete measurement of the financial-account transactions. These transactions can respond very quickly to changing conditions in financial markets, resulting in large quarterly increases or decreases in financial-account aggregates (chart 4). Quarterly changes in transactions can range from a few million dollars to hundreds of billions of dollars, and transactions can shift from an increase to a decrease from one quarter to the next. Volatility is also due to possible incomplete or imperfect measurement that may cause

Table D. Revisions to Selected Financial-Account Transactions, 2012–2015—Continues

[Billions of dollars]

	2012	2013	2014	2015
Net U.S. acquisition of financial assets excluding financial derivatives (net increase in assets/financial outflow (+)) (line 61)				
Revised	177.7	651.4	823.3	225.4
Previously published	167.4	643.9	792.1	242.2
Amount of revision	10.3	7.5	31.2	–16.8
Refined methodology	–2.2	3.8	9.3	(*)
Newly available and revised source data	12.6	3.7	21.9	–16.8
Direct investment assets (line 62)				
Revised	378.2	394.6	343.4	348.6
Previously published	377.9	399.2	357.2	345.1
Amount of revision	0.3	–4.6	–13.7	3.5
Portfolio investment assets (line 65)				
Revised	248.8	481.3	582.7	154.0
Previously published	238.8	476.2	538.1	186.3
Amount of revision	10.0	5.1	44.6	–32.4
Refined methodology	–2.0	2.1	–4.3	4.2
Newly available and revised source data	12.0	3.0	48.9	–36.6
Equity and investment fund shares (line 66)				
Revised	104.0	287.4	431.6	202.6
Previously published	95.8	284.3	436.5	172.5
Amount of revision	8.2	3.1	–4.9	30.1
Debt Securities				
Short term (line 68)				
Revised	–8.6	48.8	11.4	42.5
Previously published	–6.6	47.0	15.3	67.3
Amount of revision	–2.0	1.7	–3.9	–24.8
Refined methodology	–2.0	2.1	–4.3	4.2
Newly available and revised source data	(*)	–0.3	0.4	–29.0
Long term (line 69)				
Revised	153.4	145.1	139.7	–91.1
Previously published	149.6	144.9	86.2	–53.4
Amount of revision	3.8	0.2	53.4	–37.7
Other investment assets (line 70)				
Revised	–453.7	–221.4	–99.2	–270.9
Previously published	–453.7	–228.4	–99.5	–282.9
Amount of revision	(*)	7.0	0.3	12.0
Refined methodology	–0.2	1.7	13.6	–4.2
Newly available and revised source data	0.3	5.3	–13.2	16.3
Currency and deposits (line 71)				
Revised	–521.9	–127.0	–160.4	–194.4
Previously published	–519.3	–121.5	–147.4	–207.8
Amount of revision	–2.6	–5.4	–13.1	13.4
Refined methodology	–2.9	–10.3	–14.7	–4.5
Newly available and revised source data	0.3	4.9	1.7	17.8
Loans (line 72)				
Revised	67.5	–104.3	67.1	–74.8
Previously published	64.9	–116.7	54.6	–73.2
Amount of revision	2.6	12.4	12.5	–1.6
Refined methodology	2.6	12.0	28.3	0.2
Newly available and revised source data	(*)	0.4	–15.8	–1.8
Net U.S. incurrence of liabilities excluding financial derivatives (net increase in liabilities/financial inflow (+)) (line 84)				
Revised	625.4	1,044.6	1,056.4	395.2
Previously published	615.7	1,042.0	977.4	426.0
Amount of revision	9.6	2.7	79.0	–30.8
Refined methodology	–0.9	–1.8	2.0	–0.3
Newly available and revised source data	10.5	4.5	77.0	–30.5

(*) A nonzero value between –$50, 000,000 and $50, 000,000

NOTE. Line numbers refer to ITA table 1.2.

mismatches between components of transactions that would be offsetting if the measurement were more complete or more accurate. Annual net lending or net borrowing from the financial-account transactions is less susceptible to this measurement-driven volatility.

Net U.S. acquisition of financial assets excluding financial derivatives

Net U.S. acquisition of financial assets excluding financial derivatives was revised upward for 2012–2014 and was revised downward for 2015. The revisions reflect an upward revision to portfolio investment for 2012, upward revisions to portfolio investment and other investment for 2013, an upward revision to portfolio investment in 2014, and a downward revision to portfolio investment for 2015.

Chart 4. Net Borrowing From Financial-Account Transactions, 2010–2015

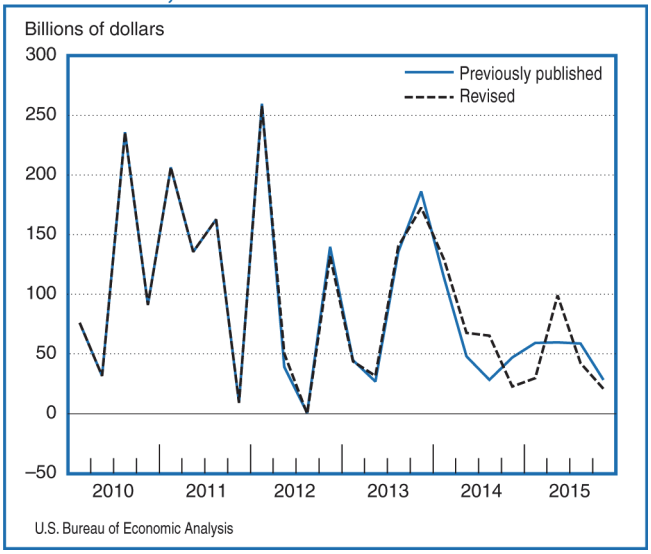


Table D. Revisions to Selected Financial-Account Transactions, 2012–2015—Table Ends

[Billions of dollars]

	2012	2013	2014	2015
Direct investment liabilities (line 85)				
Revised	243.0	277.0	207.4	379.4
Previously published	232.0	287.2	131.8	409.9
Amount of revision	11.0	–10.2	75.5	–30.4
Portfolio investment liabilities (line 88)				
Revised	747.0	512.0	701.9	250.9
Previously published	747.0	502.0	705.0	263.4
Amount of revision	(*)	10.0	–3.2	–12.4
Refined methodology	(*)	0.2	–0.1	0.2
Newly available and revised source data	(*)	0.1	–0.5	1.3
Equity and investment fund shares (line 89)				
Revised	239.1	–62.6	154.3	–178.3
Previously published	239.1	–67.5	155.1	–171.3
Amount of revision	0.0	4.8	–0.8	–7.0
Debt Securities				
Short term (line 91)				
Revised	16.3	45.7	22.3	45.8
Previously published	16.3	45.4	22.9	44.3
Amount of revision	0.1	0.3	–0.6	1.5
Refined methodology	(*)	0.2	–0.1	0.2
Newly available and revised source data	(*)	0.1	–0.5	1.3
Long term (line 92)				
Revised	491.6	529.0	525.2	383.4
Previously published	491.7	524.1	527.0	390.3
Amount of revision	(*)	4.9	–1.8	–6.9
Other investment liabilities (line 93)				
Revised	–364.7	255.7	147.1	–235.1
Previously published	–363.3	252.8	140.6	–247.2
Amount of revision	–1.4	2.8	6.6	12.1
Refined methodology	–0.9	–2.0	2.1	–0.5
Newly available and revised source data	–0.5	4.9	4.5	12.6
Currency and deposits (line 94)				
Revised	–246.0	202.8	59.6	33.4
Previously published	–245.7	202.0	51.0	36.8
Amount of revision	–0.3	0.9	8.5	–3.3
Refined methodology	–0.3	0.9	0.8	0.4
Newly available and revised source data	0.0	0.0	7.7	–3.8
Loans (line 95)				
Revised	–130.3	41.3	73.6	–282.7
Previously published	–129.2	38.5	75.3	–293.9
Amount of revision	–1.1	2.8	–1.7	11.2
Refined methodology	–0.6	–2.9	1.2	–0.9
Newly available and revised source data	–0.5	5.7	–2.9	12.1
Financial derivatives other than reserves, net transactions (line 99)				
Revised	7.1	2.2	–54.3	–25.4
Previously published	7.1	2.2	–54.4	–25.4
Amount of revision	0.0	(*)	(*)	(*)
Net lending (+) or net borrowing (–) from financial-account transactions (line 109)				
Revised	–440.5	–391.0	–287.4	–195.2
Previously published	–441.2	–395.8	–239.6	–209.2
Amount of revision	0.7	4.8	–47.7	14.0
Refined methodology	–1.3	5.6	7.3	0.3
Newly available and revised source data	–1.4	2.9	6.6	12.1

(*) A nonzero value between –$50, 000,000 and $50, 000,000

NOTE. Line numbers refer to ITA table 1.2.

Direct investment assets. Net acquisition of direct investment assets was revised upward $0.3 billion for 2012, downward $4.6 billion for 2013, downward $13.7 billion for 2014, and upward $3.5 billion for 2015. The revisions reflect newly available and revised source data from BEA's quarterly and annual surveys of direct investment.

Portfolio investment assets. Net acquisition of portfolio investment assets (equity and debt securities) was revised upward $10.0 billion for 2012, upward $5.1 billion for 2013, upward $44.6 billion for 2014, and downward $32.4 billion for 2015. The revisions primarily reflect newly available and revised source data from the Department of the Treasury's TIC surveys of U.S. holdings of foreign securities.[12]

Other investment assets. Net acquisition of other investment assets (currency and deposits, loans, insurance technical reserves, and trade credit and advances) was revised upward less than $0.1 billion for 2012, upward $7.0 billion for 2013, upward $0.3 billion for 2014, and upward $12.0 billion for 2015. The revisions mainly reflect newly available and revised source data from the TIC surveys of U.S. claims on foreigners in the form of deposits, loans, and trade credit and advances, and a refined methodology for estimating transactions denominated in foreign currencies.[13] For 2012–2013, the revisions also reflect revised data on intercompany debt transactions between financial intermediaries that are collected on BEA's direct investment surveys and recorded in other investment.

Net U.S. incurrence of liabilities excluding financial derivatives

Net U.S. incurrence of liabilities excluding financial derivatives was revised upward for 2012–2014 and downward for 2015. The revisions reflect upward revisions to direct investment for 2012, to portfolio investment and other investment for 2013, and to direct investment and other investment for 2014, and downward revisions to direct investment and portfolio investment for 2015.

Direct investment liabilities. Net incurrence of direct investment liabilities was revised upward $11.0 billion for 2012, downward $10.2 billion for 2013, upward $75.5 billion for 2014, and downward $30.4 billion for 2015. The revisions reflect newly available and revised source data from BEA's quarterly, annual, and benchmark surveys of direct investment. For 2014, some of these newly available and revised source data were disclosed by filings on BEA's recently reinstated Survey of New Foreign Investment in the United States.

Portfolio investment liabilities. Net incurrence of portfolio investment liabilities was revised upward less than $0.1 billion for 2012, upward $10.0 billion for 2013, downward $3.2 billion for 2014, and downward $12.4 billion for 2015. The revisions reflect newly available and revised source data from the TIC surveys of foreign holdings of U.S. securities.[14]

Other investment liabilities. Net incurrence of other investment liabilities was revised downward $1.4 billion for 2012. It was revised upward $2.8 billion for 2013, $6.6 billion for 2014, and $12.1 billion for 2015. The revisions mainly reflect newly available and revised source data from the TIC surveys of U.S. liabilities to foreigners in the form of deposits, loans, and trade credit and advances, and a refined methodology for estimating transactions denominated in foreign currencies.[15] For 2012 and 2013, the revisions also reflect revised source data on intercompany debt transactions between financial intermediaries that are collected on BEA's direct investment surveys and recorded in other investment.

12. Revised data from the following TIC surveys were incorporated: (1) the monthly Aggregate Holdings of Long-Term Securities by U.S. and Foreign Residents (SLT), (2) the December 2013 and December 2012 (revised) annual Report of U.S. Ownership of Foreign Securities, including Selected Money Market Instruments (SHCA), and (3) monthly and quarterly Reports by Financial Institutions of Liabilities to, and Claims on, Foreign Residents by U.S. Residents (BC, BQ—1, BQ—2).

13. Revised data from the following monthly TIC surveys were incorporated: (1) monthly and quarterly Reports by Financial Institutions of Liabilities to, and Claims on, Foreign Residents by U.S. Residents (BC, BQ—1, BQ—2) and (2) quarterly Reports of Liabilities to, and Claims on, Unaffiliated Foreign Residents by U.S. Resident Non-Financial Institutions (CQ—1 and CQ—2).

14. Revised data from the following TIC surveys were incorporated: (1) the monthly Aggregate Holdings of Long-Term Securities by U.S. and Foreign Residents (SLT), (2) the June 2014 benchmark survey of Foreign-residents' Holdings of U.S. Securities, including Selected Money Market Instruments (SHL), and (3) monthly and quarterly Reports by Financial Institutions of Liabilities to, and Claims on, Foreign Residents by U.S. Residents (BL—2 and BQ—2).

15. Revised data from the following TIC surveys were incorporated: (1) monthly and quarterly Reports by Financial Institutions of Liabilities to, and Claims on, Foreign Residents by U.S. Residents (BL—1, BL—2, BQ—2) and (2) quarterly Reports of Liabilities to, and Claims on, Unaffiliated Foreign Residents by U.S. Resident Non-Financial Institutions (CQ—1 and CQ—2).

Statistical discrepancy

The statistical discrepancy is the difference between net acquisition of assets and net incurrence of liabilities in the financial account (including financial derivatives) less the difference between total credits and total debits recorded in the current and capital accounts. In principle, the combined deficit (or surplus) on recorded transactions in the current and capital accounts should equal net borrowing (or net lending) measured by recorded transactions in the financial account. In practice, however, they differ because of incomplete source data, gaps in coverage, timing differences, or other errors and omissions.

Table A presents revisions to the statistical discrepancy for 2012–2015. The revisions reflect revisions to net borrowing from financial-account transactions and to the deficit on the current account. The statistical discrepancy was revised from $1.5 billion to –$0.9 billion for 2012 and from –$18.7 billion to –$24.2 billion for 2013, as downward revisions to the deficit on the current account exceeded downward revisions to net borrowing from financial-account transactions. For 2014, the statistical discrepancy was revised from $149.9 billion to $104.7 billion, as an upward revision to net borrowing from financial-account transactions exceeded an upward revision to the deficit on the current account. For 2015, the statistical discrepancy was revised from $274.9 billion to $267.8 billion, as a downward revision to the deficit on the current account exceeded a downward revision to net borrowing from financial-account transactions.

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Appendices A and B follow.

Appendix A. Revisions to U.S. International Transactions

[Millions of dollars, quarters seasonally adjusted]

	Balance on goods and services			Balance on primary income			Balance on secondary income		
	Previously published	Revised	Revision	Previously published	Revised	Revision	Previously published	Revised	Revision
2012	–536,773	–536,773	0	212,178	215,792	3,614	–125,075	–125,547	–472
2013	–478,394	–461,876	16,518	224,543	218,970	–5,573	–122,910	–123,515	–605
2014	–508,324	–490,176	18,148	237,984	224,005	–13,979	–119,185	–125,888	–6,703
2015	–539,756	–500,361	39,395	191,323	182,385	–8,938	–135,645	–144,988	–9,343
2012: I	–144,771	–144,771	0	56,562	57,962	1,400	–33,328	–33,485	–157
II	–136,685	–136,685	0	51,519	52,765	1,246	–32,798	–32,888	–90
III	–127,540	–127,540	0	52,862	52,954	92	–30,749	–30,836	–87
IV	–127,777	–127,777	0	51,235	52,112	877	–28,200	–28,338	–138
2013: I	–121,867	–119,610	2,257	48,753	50,239	1,486	–29,605	–29,609	–4
II	–121,256	–117,731	3,525	55,302	54,783	–519	–31,660	–31,885	–225
III	–122,154	–117,070	5,084	59,523	56,761	–2,762	–32,163	–32,416	–253
IV	–113,117	–107,466	5,651	60,965	57,187	–3,778	–29,482	–29,605	–123
2014: I	–125,418	–120,514	4,904	58,294	56,746	–1,548	–29,319	–30,887	–1,568
II	–128,712	–125,834	2,878	57,935	54,623	–3,312	–21,263	–22,849	–1,586
III	–125,871	–119,415	6,456	61,730	59,325	–2,405	–33,764	–35,529	–1,765
IV	–128,323	–124,414	3,909	60,025	53,310	–6,715	–34,840	–36,623	–1,783
2015: I	–134,327	–126,514	7,813	50,070	48,351	–1,719	–33,777	–36,386	–2,609
II	–133,107	–124,028	9,079	53,111	45,071	–8,040	–30,802	–32,947	–2,145
III	–138,575	–125,611	12,964	45,385	41,848	–3,537	–36,741	–39,343	–2,602
IV	–133,746	–124,209	9,537	42,757	47,115	4,358	–34,326	–36,312	–1,986

	Balance on current account			Balance on capital account			Net lending (+) or net borrowing (-) from financial account transactions		
	Previously published	Revised	Revision	Previously published	Revised	Revision	Previously published	Revised	Revision
2012	–449,670	–446,527	3,143	6,904	6,904	0	–441,249	–440,540	709
2013	–376,760	–366,422	10,338	–412	–412	0	–395,831	–390,987	4,844
2014	–389,526	–392,060	–2,534	–45	–45	0	–239,648	–287,378	–47,730
2015	–484,078	–462,965	21,113	–45	–42	3	–209,203	–195,227	13,976
2012: I	–121,536	–120,294	1,242	–53	–53	0	–259,562	–257,781	1,781
II	–117,964	–116,808	1,156	–241	–241	0	–39,823	–51,360	–11,537
III	–105,427	–105,423	4	–470	–470	0	–1,500	839	2,339
IV	–104,742	–104,003	739	7,668	7,668	0	–140,364	–132,238	8,126
2013: I	–102,719	–98980	3,739	–40	–40	0	–45448	–44521	927
II	–97,615	–94,833	2,782	–227	–227	0	–27,649	–32,683	–5,034
III	–94,794	–92,725	2,069	–146	–146	0	–136,247	–140,758	–4,511
IV	–81,633	–79,883	1,750	(*)	(*)	(*)	–186,486	–173,025	13,461
2014: I	–96,443	–94,654	1,789	–43	–43	0	–114,068	–129,322	–15,254
II	–92,039	–94060	–2,021	–2	–2	0	–48635	–68218	–19,583
III	–97,905	–95,619	2,286	–1	–1	0	–29,186	–65,993	–36,807
IV	–103,138	–107,726	–4,588	(*)	(*)	(*)	–47,759	–23,845	23,914
2015: I	–118,035	–114,549	3,486	–24	–22	2	–59,912	–30,642	29,270
II	–110,798	–111,904	–1,106	–20	–20	0	–60,388	–99,605	–39,217
III	–129,930	–123106	6,824	–1	–1	0	–59527	–43194	16,333
IV	–125,314	–113,406	11,908	0	0	0	–29,377	–21,786	7,591

(*) A nonzero value between –$50,000,000 and $50,000,000
n.a. Not available
NOTE. The quarterly amounts may not sum to the annual amounts because of rounding.

Appendix B

Improved Methodology: Measuring Transactions in Selected Foreign-Currency Denominated Instruments

Allocating transactions and exchange-rate changes in position

Both the previous method and the improved method for estimating transactions in selected foreign-currency denominated financial instruments apply a procedure recommended by the Balance of Payments and International Investment Position Manual, 6th Edition (BPM6). This procedure is used to estimate transactions for an aggregate set of instruments for which the currency composition of asset and liability positions underlying the transactions is known. The previous method and the improved method differ in how they estimate transactions in individual instruments for which the currency composition of asset and liability positions is unknown.

In the TIC B-form and C-form source data, positions for an aggregate set of instruments are available for all currencies combined and for five individual currencies—the Canadian dollar, the euro, the British pound, the Japanese yen and, beginning in December 2013, the Swiss franc.[1] For a position *(P)* in an aggregate set of instruments *(A)* in any of these currencies (*c*)—denoted by $P_{A,c}$—transactions values in U.S. dollars are estimated using a three-step procedure: 1) convert the quarter-start (*s*) and quarter-end (*e*) positions, $P^{S}_{A,c}$ and $P^{e}_{A,c}$, that are reported in U.S. dollars to foreign currencies using the relevant exchange rates (*XR*), XR^{s}_{c} and XR^{e}_{c} ; 2) compute the foreign-currency value of transactions as the difference between the ending and starting positions in foreign currencies, $P^{e}_{A,c}XR^{e}_{c} - P^{S}_{A,c}XR^{s}_{c}$; and 3) convert the transactions values to U.S. dollars using the average exchange rate for the quarter, $\overline{XR_c}$. This procedure is summarized in equation (1), which gives the currency portion of financial transactions (*FT*) for the aggregate set of instruments:

$$FT_{A,c} = \frac{P^{e}_{A,c}\,XR^{e}_{c} - P^{s}_{A,c}\,XR^{s}_{c}}{\overline{XR_c}} \qquad (1)$$

The financial transactions from equation (1) are summed over currencies to get total financial transactions for all currencies for the aggregate set of instruments.

$$FT_A = \Sigma_c\, FT_{A,c} \qquad (2)$$

Finally, exchange-rate changes (*ERC*) in the position are computed as the difference between the total change in the position (TC_A) and financial transactions.

$$ERC_A = TC_A - FT_A \qquad (3)$$

The refinements BEA introduced with this annual revision improve the accuracy of estimates of transactions and exchange-rate changes in positions for the individual instruments included in the aggregate set of instruments. The currency composition of the individual instrument positions is not available in BEA's source data. The estimation challenge faced in this situation is illustrated below:

Source Data Availability Example

Instrument	Currency			
	1	2	3	All currencies
X	n.a.	n.a.	n.a.	$
Y	n.a.	n.a.	n.a.	$
Z	n.a.	n.a.	n.a.	$
Aggregate	$	$	$	$

Here, each cell indicates whether asset or liability positions are available ($) or not available (n.a.) in the source data. Equation (1) above represents calculations of transactions for currency-specific aggregates (green shaded cells). Equation (2) sums over currencies (blue shaded cell). As indicated in equa-

1. The difference between positions for the aggregate set of instruments for all currencies and the sum of the positions for the five individual currencies is treated as the position in "other currencies." In the previous method, the percentage exchange-rate change in position for the "other currencies" aggregate is computed as the percentage change in the Special Drawing Right (SDR) exchange rate. In the improved method, the percentage exchange-rate change in position for the "other currencies" aggregate is computed as the weighted average of the percentage exchange-rate changes in position for the 18 countries represented in the "other currencies" group. The country distribution of positions is used to proxy the currency mix of positions.

tions (5)–(8) below, to estimate transactions by instrument in both its previous and in its improved methodology, BEA uses known positions in instruments (orange shaded cells) to allocate transactions and exchange-rate changes in positions using estimates first calculated for the all-currency aggregate set of instruments (blue shaded cell).

As with the aggregate set of instruments, the total change in position for instrument *(i)* is assumed to consist of financial transactions and the exchange-rate change in the position.

$$TC_i = FT_i + ERC_i \qquad (4)$$

The goal of both the previous and improved methodologies is to estimate the two terms in this equation without recourse to an instrument-level counterpart to equation (1), as the currency compositions of the instrument positions are not available in the source data. The previous methodology estimated these terms by assuming that the individual instrument transactions for all currencies are proportional to the transactions for the aggregate set of instruments for all currencies, with a factor of proportionality provided by the ratio of the instrument total change to the aggregate total change.

$$FT_i = \left(\frac{TC_i}{TC_A}\right) FT_A \qquad (5)$$

As a result of this assumption, the same proportions used to estimate transactions for all currencies were reflected in estimates of exchange-rate changes in positions for all currencies, regardless of the actual behavior of exchange rates. The exchange-rate changes in positions were estimated by residual using equations (4) and (5). Substituting (3) and (5) into (4) shows that the resulting exchange-rate changes in position were effectively determined by the same proportions as the transactions.

$$ERC_i = \left(\frac{TC_i}{TC_A}\right) ERC_A \qquad (6)$$

These assumptions about proportional transactions and exchange-rate changes in positions ensured that individual instrument transactions summed to total transactions for the aggregate set of instruments and that individual instrument exchange-rate changes in positions summed to total exchange-rate changes in positions for the aggregate set of instruments. However, the assumptions distorted some estimates of the allocation of total changes between transactions and exchange-rate changes in positions. Under these assumptions, for instance, if the direction of the instrument total change was opposite the direction of the aggregate total change, then the ratio had a negative sign, causing the estimated exchange-rate change in position for the instrument to be in the opposite direction of the exchange-rate change in position for the aggregate, even though the holdings of the instrument may well have a similar currency composition as that of the aggregate.

The improved methodology dispenses with the assumption of proportional transactions in favor of an assumption that exchange-rate changes in position for individual instruments, as a percentage of those positions, equal the percentage exchange-rate changes of the aggregate position (where the position is measured as the average of the quarter-start position and the quarter-end position):

$$ERC_i = ERC_A \left(\frac{P_i^s + P_i^e}{P_A^s + P_A^e}\right) \qquad (7)$$

This assumption produces the most accurate estimate when individual instrument positions are denominated in the same mix of currencies as the aggregate set of instruments. It is increasingly less accurate as the currency mixes of instrument positions differ from the aggregate.

In comparison to the previous methodology, the sequence of calculations is reversed. The improved methodology calculates exchange-rate changes in individual instrument positions first by assuming those changes to be a function of exchange-rate changes in position for the aggregate set of instruments; transactions are then calculated as the residual.

$$FT_i = TC_i - ERC_i \qquad (8)$$

This improved methodology produces exchange-rate changes in positions that reflect a weighted average of the actual changes in exchange rates observed during the quarter. Unlike outcomes that were possible

with the previous methodology, it will not generate the following:

- A negative (or zero) exchange-rate change in any individual instrument position when all currencies appreciate against the U.S. dollar.
- Large-magnitude and opposite-sign exchange-rate changes in positions for individual instruments. This could occur under the previous methodology when the total change in the aggregate position was very small relative to the magnitude of changes in the individual instrument positions.

Table 1 compares hypothetical allocations of transactions and exchange-rate changes in position under the previous and improved methodologies for three instruments of an aggregate that is comprised of negotiable certificates of deposits (NCDs), short-term securities (ST Sec), and loans. In each case, the key assumptions are illustrated with shading. For the previous methodology, the values on the left-hand-side of equation (5) are shown in dark shading in the top panel of the table and the values from the right-hand-side of that equation are shown in light shading. For the improved methodology, the values on the left-hand-side of equation (7) are shown in dark shading in the bottom panel of the table and the values from the right-hand-side of that equation are shown in light shading.

Because of the proportions imposed on the exchange-rate induced changes in positions under the previous methodology, the percent exchange-rate changes in positions for the individual instruments do not reflect the percent exchange-rate change in position for the aggregate in the top row. The exchange-rate change in position for short-term securities implies foreign currency depreciation, while the other instrument entries imply foreign currency appreciation ranging from 25 percent to 33 percent. These widely divergent exchange-rate implications are not consistent with the aggregate behavior of foreign currencies and most likely do not reflect the actual currency compositions of the three instrument positions.

By contrast, under the new methodology, the percent exchange-rate changes in individual instrument positions are fixed at the percent exchange-rate change of the aggregate. This generates more plausible exchange-rate changes in positions. It also generates more tenable transactions values. For instance, in short-term securities, financial transactions are no longer assumed to exceed the starting position.

Incorporating exchange rate information from additional currencies

Replacing the SDR with the basket of 18 other currencies improves the methodology in two specific ways.

First, as discussed above, it provides a more representative sample of currencies for positions not denominated in one of the five currencies for which a source data breakout is available. While the SDR is composed of a basket of currencies, that basket only contains currencies already in the group of five currencies available in BEA's source data. By definition, the "other currency" positions are denominated in currencies not represented in the SDR.

Second, using the 18 currencies generates more accurate estimates of transactions and exchange-rate changes in positions for country-level statistics. In estimating transactions and exchange-rate changes in positions by country to the extent allowed by the data,

Table 1. Instrument Transactions Using the Previous and Improved Methodologies

Aggregate and instruments	Position		Total change in position	Total change proportion of aggregate	Financial transactions	Exchange-rate change in position	Percent exchange-rate change in position
	Period-start	Period-end					
	Previous methodology						
Aggregate	206,000	205,000	–1,000		–7,500	6,500	3.16
Negotiable certificates of deposits	4,525	4,300	–225	0.225	–1,688	1,463	33.16
Short-term securities	38,000	43,500	5,500	–5.500	41,250	–35,750	–87.73
Loans	163,475	157,200	–6,275	6.275	–47,063	40,788	25.44
	Improved methodology						
Aggregate	206,000	205,000	–1,000		–7,500	6,500	3.16
Negotiable certificates of deposits	4,525	4,300	–225	n.a.	–365	140	3.16
Short-term securities	38,000	43,500	5,500	n.a.	4,211	1,289	3.16
Loans	163,475	157,200	–6,275	n.a.	–11,347	5,072	3.16

BEA assumes that the position for an individual country is denominated in the currency used by the country. For instance, assume the total U.S. foreign-currency liability position with Japan is $350 million. As long as the U.S. position in yen-denominated liabilities is at least $350 million, BEA assumes that all such liabilities are in yen and calculates exchange-rate changes in positions and transactions vis-à-vis Japan accordingly.

If the U.S. position in yen-denominated liabilities is less than $350 million, BEA will use the yen in calculations for that portion of the $350 million position with Japan and use a mix of other currencies for which currency positions exceed associated country positions for the remainder of the position with Japan. Conversely, if the position in yen-denominated liabilities is greater than $350 million, the difference is combined with similar differences for all other cases in which positions in given currencies exceed associated country positions. This mix of "excess" currency positons is then distributed to cases for which positions in currencies are lower than associated country positions.