U.S. International Transactions, Revised Estimates for 1974–96

By Christopher L. Bach

As is customary each June, the estimates of U.S. international transactions have been revised to incorporate methodological and statistical revisions. This year, like last year, a number of improvements have been implemented as part of a multiyear effort by the Bureau of Economic Analysis (BEA) to address gaps in coverage of transactions. These gaps and plans to fill them were outlined by BEA in its Mid-Decade Strategic Plan for improving BEA's economic accounts (see the February and April 1995 and June 1996 issues of the SURVEY OF CURRENT BUSINESS). The improvements also address various gaps noted by the International Monetary Fund, the National Academy of Sciences, and the General Accounting Office.[1] In large part, the gaps have arisen because of the dynamic nature of the international markets. The major improvements this year respond to rapid changes in both the capital markets and the services markets.

- In the investment income accounts, greatly improved estimates of income receipts are introduced based on results of a new benchmark survey of the stock of U.S. portfolio investment abroad as of March 1994. Conducted by the Treasury Department, this survey is the first such survey in more than 50 years, and its completion represents a major milestone in the multiyear program for statistical improvements developed jointly by BEA, the Treasury Department, and the Federal Reserve Board. The new position data enable BEA to develop improved estimates of bond interest and dividend income receipts. The new position data also permit BEA to greatly improve its estimates of U.S. bond and stock holdings that are included in the U.S. international investment position.

- In the capital accounts, estimates of international flows of U.S. currency appear for the first time. With this addition, BEA closes what had grown into a sizable gap

1. *Report on the World Current Account Discrepancy* (Washington, DC: International Monetary Fund, September 1987).

Report on the Measurement of International Capital Flows (Washington, DC: International Monetary Fund, September 1992).

Behind the Numbers: U.S. Trade in the World Economy (Washington, DC: National Research Council, 1992).

Following the Money: U.S. Finance in the World Economy (Washington DC: National Research Council, 1994).

Measuring U.S.-Canada Trade: Shifting Trade Winds May Threaten Recent Progress (Washington, DC: General Accounting Office, January 1994).

Economic Statistics: Status Report on the Initiative to Improve Economic Statistics (Washington, DC: General Accounting Office, July 1995).

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The revised estimates of the direct investment accounts were prepared under the general direction of David Belli. Gregory Fouch, with the assistance of Karen Poffel and other staff in the International Investment Division, prepared the revised estimates of foreign direct investment in the United States.

Special assistance was provided this year by Richard Porter and Ruth Judson of the Federal Reserve Board, who developed the estimates of U.S. currency flows; by Milton Pappas and William Griever of the U.S. Treasury Department, who conducted the benchmark survey of U.S. portfolio investment abroad and by Diane Oberg and staff of the Bureau of the Census' Foreign Trade Division, who conducted the study of "residual" seasonality for goods.

in coverage in the international transactions and investment position accounts. The gap had developed in recent decades, as strong foreign demand developed for U.S. currency, particularly in the form of Federal Reserve notes. Because of difficulty in accurate measurement, currency flows do not appear in the international accounts of most countries. The new estimates were developed by the Federal Reserve Board.

- In the services accounts, "other" private service receipts and "other" private service payments are revised to include preliminary results of BEA's annual surveys of financial services for 1995 and 1996. These are BEA's first annual surveys of financial services, and they update the results of BEA's first benchmark survey of financial services with unaffiliated foreigners, covering 1994. These new surveys enable BEA to better capture the diversity of transactions in financial services and more accurately portray the key role of U.S. institutions in cross-border trade in financial services.
- Also in the services accounts, estimates have been revised to incorporate preliminary results from BEA's 1996 benchmark survey of selected services (largely business, professional, and technical services), to incorporate revised and more accurate estimates of "other" transportation, and to include new estimates of earnings and expenditures of temporary workers in the United States.
- In addition, results of BEA's 1992 benchmark survey of foreign direct investment in the United States are incorporated into the capital, investment income, and services accounts. The survey covers the universe of direct investment and is part of BEA's ongoing program of regular quinquennial benchmark surveys.
- Finally, unrealized currency translation gains and losses have been removed from certain banking transactions to provide a more accurate measure of U.S. banks' international activity.

In addition to these improvements, revisions are made to all accounts to incorporate revised and updated source data. Among the accounts most affected by this type of change were travel receipts for 1995 and 1996, which incorporated updated source data from the Immigration and Naturalization Service. Revisions were also made to the inward and outward direct investment ac-

Table 1.—Revisions to the Current-Account Estimates

[Millions of dollars; quarterly data are seasonally adjusted]

	Exports of goods, services, and income			Imports of goods, services, and income			Unilateral transfers			Balance on current account		
	Previously published	Revised	Revision	Previously published	Revised	Revision	Previously published	Revised	Revision	Previously published	Revised	Revision
1985	382,747	382,749	2	–484,037	–484,037	....	–22,954	–22,700	254	–124,243	–123,987	256
1986	401,258	400,842	–416	–528,513	–529,356	–843	–24,833	–24,679	154	–152,088	–153,193	–1,105
1987	449,292	449,272	–20	–592,745	–593,416	–671	–23,939	–23,909	30	–167,392	–168,053	–661
1988	560,233	560,620	387	–662,403	–662,876	–473	–26,266	–25,988	278	–128,436	–128,245	191
1989	641,659	642,921	1,262	–719,539	–720,189	–650	–27,696	–26,963	733	–105,575	–104,231	1,344
1990	697,083	700,455	3,372	–756,522	–757,758	–1,236	–35,219	–34,588	631	–94,657	–91,892	2,765
1991	717,726	722,557	4,831	–731,753	–733,335	–1,582	4,510	5,122	612	–9,518	–5,657	3,861
1992	736,704	743,358	6,654	–763,773	–764,549	–776	–35,514	–35,192	322	–62,583	–56,383	6,200
1993	762,851	773,387	10,536	–825,147	–826,020	–873	–37,640	–38,137	–497	–99,936	–90,771	9,165
1994	840,006	854,156	14,150	–948,544	–948,849	–305	–39,866	–38,845	1,021	–148,405	–133,538	14,867
1995	969,189	991,490	22,301	–1,082,268	–1,086,539	–4,271	–35,075	–34,046	1,029	–148,154	–129,095	19,059
1996	1,032,478	1,055,233	22,755	–1,155,101	–1,163,450	–8,349	–42,472	–39,968	2,504	–165,095	–148,184	16,911
1992:I	183,103	184,610	1,507	–183,077	–183,097	–20	–7,680	–7,625	55	–7,654	–6,112	1,542
II	184,312	185,967	1,655	–191,127	–191,301	–174	–8,580	–8,462	118	–15,395	–13,796	1,599
III	183,063	184,924	1,861	–192,693	–193,033	–340	–7,871	–7,867	4	–17,501	–15,976	1,525
IV	186,226	187,856	1,630	–196,875	–197,118	–243	–11,383	–11,237	146	–22,032	–20,499	1,533
1993:I	187,026	189,422	2,396	–196,816	–197,041	–225	–8,380	–8,502	–122	–18,170	–16,121	2,049
II	190,582	192,533	1,951	–206,269	–206,335	–66	–8,533	–8,501	32	–24,220	–22,303	1,917
III	188,218	191,354	3,136	–206,420	–206,720	–300	–9,215	–9,347	–132	–27,417	–24,713	2,704
IV	197,027	200,077	3,050	–215,643	–215,928	–285	–11,513	–11,787	–274	–30,129	–27,638	2,491
1994:I	197,420	200,670	3,250	–218,959	–218,852	107	–8,169	–7,971	198	–29,708	–26,153	3,555
II	204,809	208,713	3,904	–231,327	–231,438	–111	–9,507	–9,275	232	–36,025	–32,000	4,025
III	214,287	217,714	3,427	–244,323	–244,405	–82	–9,975	–9,671	304	–40,011	–36,362	3,649
IV	223,494	227,062	3,568	–253,934	–254,154	–220	–12,215	–11,928	287	–42,655	–39,020	3,635
1995:I	233,086	237,587	4,501	–263,501	–263,845	–344	–8,639	–8,451	188	–39,054	–34,709	4,345
II	241,497	246,787	5,290	–274,183	–274,363	–180	–8,290	–8,128	162	–40,976	–35,704	5,272
III	244,479	250,734	6,255	–273,175	–275,019	–1,844	–8,992	–8,847	145	–37,688	–33,132	4,556
IV	250,128	256,382	6,254	–271,409	–273,316	–1,907	–9,154	–8,620	534	–30,435	–25,554	4,881
1996:I	252,656	256,382	3,726	–276,975	–278,860	–1,885	–10,955	–10,406	549	–35,274	–32,884	2,390
II	257,035	262,335	5,300	–288,208	–289,231	–1,023	–9,420	–8,689	731	–40,593	–35,585	5,008
III	254,405	261,979	7,574	–292,782	–295,865	–3,083	–9,476	–8,947	529	–47,853	–42,833	5,020
IV	268,380	274,545	6,165	–297,139	–299,493	–2,354	–12,621	–11,926	695	–41,380	–36,874	4,506

counts as a result of updated or revised annual survey results.

Table 1 presents a summary of revisions from all sources. Table 2 presents detail on the revisions due to new source data and methodologies. For 1996, $22.8 billion is added to exports of goods, services, and income, and $8.4 billion is added to imports of goods, services, and income. The largest single source of addition to exports was the upward revision to income receipts of $8.4 billion in 1996. Many of the revisions to the services accounts were about offsetting for exports and imports, but the upward revision to travel receipts far exceeded the upward revision to travel payments. In total, the U.S. current-account deficit was reduced $16.9 billion.

The remainder of this article discusses the major revisions and the years directly affected as follows:

- Benchmark survey of U.S. portfolio investment abroad (1985–96)
- U.S. currency flows (1974–96)
- Financial services (1995–96)
- Benchmark survey of foreign direct investment in the United States (1992–96)
- Benchmark survey of selected services (1996)
- Transportation estimates (1995–96)

Table 2.—Major Sources of Revisions, 1985–1996

[Millions of dollars]

(Credits +; debits –) [1]	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
International transactions:												
Other transportation receipts (line 7):												
Revised								22,616	23,050	24,941	27,412	27,216
Changes due to truck freight charges											246	228
Changes due to ocean port services								–1,075	–858	–961	–1,391	–2,299
Revisions due to updated source data									14	41	494	172
Previously published								23,691	23,894	25,861	28,063	29,115
Royalties and license fees receipts (line 8):												
Revised								19,656	20,304	22,661	27,383	29,974
Changes due to 1992 foreign direct investment benchmark								–59	–19	(2)	(2)	(2)
Revisions due to updated source data										389	430	1,145
Previously published								19,715	20,323	22,272	26,953	28,829
Other private services receipts (line 9):												
Revised		27,303	28,701	30,709	36,204	39,540	47,024	50,294	54,517	61,093	66,850	73,569
Changes due to financial services											920	488
Changes due to expenditures of temporary workers		438	338	222	322	626	799	983	1,070	1,241	1,303	1,302
Changes due to 1996 benchmark of selected services												424
Changes due to 1992 foreign direct investment benchmark								243	74	(2)	(2)	(2)
Revisions due to updated source data		–64	–103	–131	–202	–279	–373	–223	–63	781	2,903	4,087
Previously published		26,929	28,466	30,618	36,084	39,193	46,598	49,291	53,436	59,071	61,724	67,268
Other private income receipts (line 13):												
Revised	57,633	52,806	55,592	70,571	92,638	94,072	81,186	66,826	63,495	79,498	101,836	102,866
Changes due to dividend income	119	328	770	1,204	1,823	3,070	2,946	4,327	4,076	6,012	7,995	8,947
Changes due to bond interest income	–117	–1,118	–1,026	–908	–681	–46	1,459	2,479	6,087	3,846	3,400	–471
Revisions due to updated source data										694	1,377	312
Previously published	57,631	53,596	55,848	70,275	91,496	91,048	76,781	60,020	53,332	68,946	89,064	94,078
Other transportation payments (line 21):												
Revised								–24,894	–25,746	–27,255	–28,249	–28,453
Changes due to truck freight charges											233	256
Revisions due to updated source data								565	582	728	723	391
Previously published								–25,459	–26,328	–27,983	–29,205	–29,100
Royalties and license fees payments (line 22):												
Revised								–5,089	–4,819	–5,560	–6,503	–7,322
Changes due to 1992 foreign direct investment benchmark								–15	–23	(2)	(2)	(2)
Revisions due to updated source data									–31	–42	–191	–286
Previously published								–5,074	–4,765	–5,518	–6,312	–7,036
Other private services payments (line 23):												
Revised		–14,785	–17,999	–19,028	–20,548	–24,387	–28,098	–25,066	–29,356	–33,138	–39,285	–42,796
Changes due to financial services											–765	–1,182
Changes due to earnings of temporary workers		–844	–671	–474	–675	–1,232	–1,579	–1,886	–2,059	–2,377	–2,499	–2,506
Changes due to 1996 benchmark of selected services												–231
Changes due to 1992 foreign direct investment benchmark								51	–59	(2)	(2)	(2)
Revisions due to updated source data					25	–5	–3	456	659	219	–2,051	–1,251
Previously published		–13,941	–17,328	–18,554	–19,898	–23,150	–26,516	–23,687	–27,897	–30,980	–33,970	–37,626
Direct investment income payments (line 26):												
Revised								–302	–5,574	–20,154	–30,345	–32,132
Changes due to 1992 foreign direct investment benchmark								15	–18	(2)	(2)	(2)
Revisions due to updated source data										1,076	1,073	1,685
Previously published								–317	–5,556	–21,230	–31,418	–33,817

- Earnings and expenditures of temporary workers (1986–96)
- Currency translation gains and losses (1992–96)
- Nonbank claims and liabilities (1997)
- Goods (1994–96)
- Nonresident taxes (1985–96)

Benchmark survey of U.S. portfolio investment abroad

The U.S. Department of the Treasury recently completed a benchmark survey of U.S. portfolio investment in foreign long-term securities. This was the first such survey of U.S. ownership of foreign securities since a war-time survey conducted in May 1943. The survey collected data on the aggregate market value and composition of foreign long-term securities owned by U.S. persons as of March 31, 1994. Long-term securities are bonds with original maturities of more than 1 year and all equities. The survey was conducted in close consultation with the Bureau of Economic Analysis, the Federal Reserve Board, the Federal Reserve Bank of New York, the Securities and

Table 2.—Major Sources of Revisions, 1985–1996—Continued

[Millions of dollars]

(Credits +; debits –) [1]	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Private remittances and other transfers (line 32):												
Revised	–9,295	–10,424	–11,192	–12,742	–13,308	–13,972	–15,309	–15,348	–17,235	–18,630	–19,530	–20,704
Changes due to tax payments	254	113	–23	204	668	547	529	370	–27	1,149	1,390	2,540
Revisions due to updated source data	....	41	53	74	65	83	82	–22	–472	–273	–224	361
Previously published	–9,549	–10,578	–11,222	–13,020	–14,041	–14,602	–15,920	–15,696	–16,736	–19,506	–20,696	–23,605
U.S. claims reported by U.S. banks (line 47):												
Revised	....	....	....	....	....	....	....	21,175	30,615	–4,200	–75,108	–98,186
Changes due to removal of unrealized gains and losses	....	....	....	....	....	....	....	280	668	2,760	87	–2,181
Revisions due to updated source data	....	....	....	....	....	....	....	....	....	1,201	–6,049	–7,786
Previously published	....	....	....	....	....	....	....	20,895	29,947	–8,161	–69,146	–88,219
Direct investment in the United States, net capital flows (line 57):												
Revised	....	....	....	....	....	....	....	17,936	48,993	45,679	67,526	76,955
Changes due to 1992 foreign direct investment benchmark	....	....	....	....	....	....	....	336	5,971	(2)	(2)	(2)
Revisions due to updated source data	....	....	....	....	....	....	....	....	....	–4,081	7,290	–6,995
Previously published	....	....	....	....	....	....	....	17,600	43,022	49,760	60,236	83,950
U.S. Treasury securitities and U.S. currency flows (line 58):												
Revised	25,633	7,909	–2,243	26,039	35,518	16,266	34,226	50,531	43,281	57,674	111,848	172,878
Changes due to new estimates of U.S. currency flows	5,200	4,100	5,400	5,800	5,900	18,800	15,400	13,400	18,900	23,400	12,300	17,300
Revisions due to updated source data	....	....	....	....	....	....	....	....	....	49	208	1,794
Previously published	20,433	3,809	–7,643	20,239	29,618	–2,534	18,826	37,131	24,381	34,225	99,340	153,784
U.S. liabilities reported by U.S. banks (line 61):												
Revised	....	....	....	....	....	....	....	16,216	25,063	104,338	30,176	9,784
Changes due to removal of unrealized gains and losses	....	....	....	....	....	....	....	755	621	–3,440	58	3,272
Revisions due to updated source data	....	....	....	....	....	....	....	....	3,583	–4,064	4,835	8,070
Previously published	....	....	....	....	....	....	....	15,461	20,859	111,842	25,283	–1,558
International investment position (at yearend):												
Foreign securities (line 19):												
Revised	119,403	158,123	188,589	232,849	314,294	342,313	455,750	515,083	853,528	889,706	1,054,352	1,273,439
Changes due to 1994 U.S. Treasury benchmark	5,115	14,692	34,637	56,873	96,682	113,620	153,325	178,537	302,895	333,465	332,603	(3)
Revisions due to updated source data	....	....	....	....	....	....	....	....	....	....	....	(3)
Previously published	114,288	143,431	153,952	175,976	217,612	228,693	302,425	336,546	550,633	556,241	721,749	(3)
Direct investment in the United States (lines 35 and 36):												
Revised:												
At current cost	....	....	....	....	....	....	....	500,542	550,862	584,970	654,502	729,052
At market value	....	....	....	....	....	....	....	696,177	768,389	773,726	1,031,981	1,253,642
Changes due to 1992 benchmark:												
At current cost	....	....	....	....	....	....	....	1,148	11,711	(2)	(2)	(3)
At market value	....	....	....	....	....	....	....	1,965	7,539	(2)	(2)	(3)
Revisions due to updated source data:												
At current cost	....	....	....	....	....	....	....	....	....	5,144	15,983	(3)
At market value	....	....	....	....	....	....	....	....	....	1,872	12,778	(3)
Previously published:												
At current cost	....	....	....	....	....	....	....	499,394	539,151	579,826	638,519	(3)
At market value	....	....	....	....	....	....	....	694,212	760,859	771,854	1,019,203	(3)
U.S. currency (line 38):												
Revised	68,900	73,000	78,400	84,200	90,100	108,900	124,300	137,700	156,600	180,000	192,300	209,600
Previously published	....	....	....	....	....	....	....	....	....	....	....	....

1. Credits +: An increase in U.S. receipts and U.S. liabilities, or a decrease in U.S. payments and U.S. claims. Debits –: An increase in U.S. payments and U.S. claims, or a decrease in U.S. receipts and U.S. liabilities.
2. Revisions due to the 1992 benchmark are not separately identifiable after 1993.
3. Estimates for 1996 were not published previously.

NOTE.—For international transactions, line references are to table 1 of "U.S. International Transactions, First Quarter 1997," in this issue of the SURVEY OF CURRENT BUSINESS. For the international investment position, line references are to table 1 of "The International Investment Position of the United States in 1996" in this issue of the SURVEY.

Exchange Commission, other U.S. Government agencies, and the financial community.

Both custodians and fund managers, including qualified investors, were surveyed to ensure comprehensiveness. Custodians were identified as entities located in the United States who managed the safe-keeping of $20 million or more in foreign long-term securities for themselves or on behalf of other U.S. persons; most foreign securities are held by custodians or sub-custodians. Fund mangers and investors were identified as entities located in the United States who owned or managed investment in foreign long-term securities of $5 million or more on behalf of institutional or private investors.

Detailed data collected from fund managers was compared with summary level data collected from custodians, both to check on the completeness of coverage and to eliminate duplication of coverage. In all, 3,344 fund managers and custodians participated in the survey. Survey data was collected on an individual security basis by international security identification or CUSIP number and then aggregated by industry, by country, by type of security, by type of instrument, and by currency.[2]

The results of the survey, as expected, show large U.S. holdings. The total value of foreign bond and stock holdings as of March 31, 1994, was $870.3 billion. The survey results now replace estimates based on transactions contained in the Treasury Department's International Capital Reporting system and BEA estimates.

The survey results are $302.6 billion higher than the BEA estimated position of $550.6 billion at yearend 1993, which was published in the article on the net U.S. international investment position in the July 1996 SURVEY OF CURRENT BUSINESS.

The differences between the two estimates can be attributed both to incomplete coverage of these transactions in the Treasury source data upon which BEA's position estimates are based and to inexact valuation of price and exchange rate adjustments applied to BEA's estimated positions. However, it is not possible to determine the amount of underestimation attributable to each part of the estimation process.

Foreign bonds.—The benchmark survey estimate of U.S. holdings of foreign bonds is $309.7 billion at yearend 1993, compared with BEA's previous estimate of $247.8 billion.

BEA's estimation procedures for bonds are divided between dollar-denominated and foreign-currency-denominated bonds. This division reflects the conventions used by BEA for estimating both positions and income. BEA's estimates of U.S. holdings of dollar-denominated bonds were overstated because of underestimation of the amount of redemptions and because of purchases by foreigners at the time bonds were originally sold (issued) in the United States. BEA's estimates of U.S. holdings of foreign-currency-denominated bonds were understated because of incomplete coverage and the lack of any geographic information on the nationality and currency of issuer, which is required in order to apply appropriate price and exchange rate valuations. The Treasury survey provides a one-time measure of the geographic distribution by nationality and currency of issuer; BEA has used this opportunity to revise its measures of valuation changes by applying appropriate prices, exchange rates, and yields to the updated geographic distribution of holdings.

The increase in reported bond holdings in the Treasury survey has resulted in a re-estimation of associated interest receipts. Receipts are estimated by applying market yields to revised portfolio holdings. Interest income receipts on bonds are revised upward $6.1 billion, to $23.3 billion, for 1993 as a result of the improved coverage of transactions. The benchmark survey also permits improved geographic attribution of bond interest income. The updated geography is used to attribute income to the country of ownership of the securities rather than to the country where transactions occur, which is the basis for BEA's estimates for the years between benchmark surveys. This distinction is important because allocations by country of transaction overstate income receipts from countries with well-developed financial markets—such as the United Kingdom, Switzerland, the Netherlands, and Hong Kong—and correspondingly understate income receipts from other countries.

Foreign stocks.—The benchmark survey estimate of U.S. holdings of foreign stocks is $543.9 billion at yearend 1993, compared with BEA's previous estimate of $302.8 billion. As with foreign bonds, the primary reasons for underestimation are incomplete coverage and inexact valuation. Acquisitions omitted from the position estimates in the past would not have been included in the accumulated appreciation of stock values that has occurred over the past several decades. Continued undercoverage over the years would have

2. For more detail on the methodology and survey results, see Milton Pappas, "United States Long-Term Portfolio Investment Abroad," *Treasury Bulletin* (Summer 1997).

compounded this understatement. In addition, necessary geographic detail to which to apply appropriate stock prices and exchange rate indexes was lacking. BEA has used this opportunity to revise its measures of valuation changes by applying appropriate prices, exchange rates, and dividend yields to the updated geographic distribution of holdings.

The increase in reported stock holdings in the Treasury survey has resulted in a re-estimation of the associated dividend receipts. Receipts are estimated by applying market rates to revised portfolio holdings. Dividend income receipts on stocks are revised up $4.1 billion, to $10.9 billion, for 1993 as a result of improved coverage of transactions. As with interest income on bonds, the much more accurate picture of U.S. stock holdings abroad by country of ownership has enabled BEA to improve its geographic allocation of dividend receipts.

Historical revisions.—To avoid a major break in series, the position estimates for bonds and stocks were carried backward from yearend 1993 to yearend 1984. The adjustment is based on the cumulative volume of trading over the entire timespan, which is apportioned to each year by the annual percentage of the cumulative volume that occurred in that year. The 1984 starting point was chosen because that was when the explosive growth in gross trading volume of foreign bonds and foreign stocks began (chart 1). Adjustment of the position estimates for the years prior to 1984 would have had only a marginal effect on estimated positions.

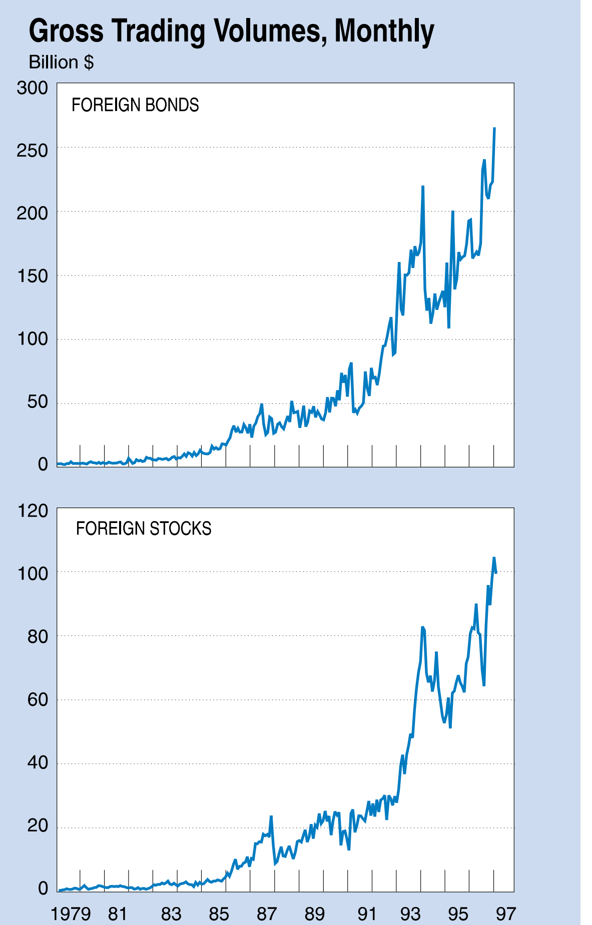
U.S. currency flows

U.S. currency—particularly Federal Reserve notes—is widely held by foreigners. The currency is used for many of the same reasons as in the United States. It serves as a unit of account, a medium of exchange, and a store of value, especially when the purchasing power of the domestic currency is uncertain. As a safe asset in an unpredictable world, dollars flow into a country during periods of economic and political upheaval and sometimes remain there well after the crisis has subsided. In other situations, the dollar co-circulates with the domestic currency for extended time periods.

Although the amount of U.S. currency outstanding is known, the shares in domestic and in foreign circulation are notoriously difficult to measure accurately. Notwithstanding the growing importance of cross-border U.S. currency flows in the past two decades, estimates of U.S. currency flows have not been included in the international transactions accounts or international investment position accounts because of this difficulty. This difficulty is not surprising, given the diversity of channels through which currency may flow abroad, the destinations of the currency, and its varied uses.

Recently, however, the Federal Reserve Board's research staff completed a multiyear research project to measure such flows. The research uses pioneering approaches to the measurement of U.S. currency flows abroad by direct and indirect methods of estimation that are based on numerous statistical measurement techniques and multiple data sources. Major conclusions from the study were the following: The amount of U.S. currency going into domestic circulation each year has not varied much over the past two decades, while the amount of currency going abroad has risen strongly, particularly in the 1990's; consequently, the share of U.S. currency

CHART 1



U.S. Department of Commerce, Bureau of Economic Analysis going into domestic circulation each year has dropped over the past two decades, while the share going abroad has risen strongly; these same broad conclusions emerge regardless of which measurement technique or set of source data was used; and all measurement techniques identified the same periods of major accelerations and decelerations in net outflows of currency.[3]

After a review of all the methods of measurement, a modification of one of the direct methods of measurement was developed in close consultation with the Federal Reserve Board's research staff. It is this modification that is used for the new estimates.

The exact amount of currency flowing abroad is not known. As a proxy, the new estimates use total net disbursements of $100 notes from the New York City and Los Angeles cash offices of the Federal Reserve district banks.

Several institutional characteristics of the circulation of U.S. currency support this approach to measurement and indicate that most of these notes flow to and from foreigners. First, mostly lower denomination notes ($5's, $10's, $20's, and $50's) circulate in the U.S. economy, whereas mostly $100 notes circulate abroad. A 1995 survey of U.S. households found that they could account at most for a little more than 3 percent of total holdings of $100 notes. Second, the shipment of $100 notes from the New York City cash office is very large relative to the size of its district as measured by several economic variables, including its regional share of vault cash, population, income, and deposits. Third, the inclusion of the Los Angeles cash office is based on information that suggests that $100 notes returned to the United States from abroad (largely from Asian countries) are shipped primarily to Los Angeles. From 1990 to 1996, the New York City and Los Angeles cash offices have placed on net almost 84 percent of the $142.7 billion increase in $100 notes in circulation.

The proxy is known to be deficient in that it (1) excludes very small shipments of lower denomination notes sent abroad by these offices; (2) excludes very small shipments of $100 notes sent abroad by other Federal Reserve cash offices; and (3) includes the very small amount of $100 notes that are distributed into the U.S. economy. However, none of these deficiencies is thought to introduce major shortcomings to the proxy chosen.

The broad geographic areas to which U.S. currency has flowed in recent years are known. From 1988 to 1991, U.S. currency flowed first to Latin America, primarily to Argentina, and then to the rest of the world in response to the uncertainties created by the Persian Gulf War. In 1993 and 1994, the deteriorating situation in Russia and other parts of the former Soviet Union led to large outflows to those areas. Net U.S. currency flows to Russia alone accounted for more than half of total net flows of U.S. currency from 1994 to 1996. Additional flows have been to the Middle East and Far East. Although net currency flows tended to drop back after each of these surges, the general upward path of net currency flows abroad is unmistakable (table 3).

Quarterly estimates of net currency flows abroad are introduced into the U.S. international transactions accounts for 1974–96, and the amounts held by foreigners, into the annual estimates of the U.S. international investment position accounts for 1973–96. At yearend 1973, U.S. currency held abroad was $30.5 billion, or 49 percent of U.S. currency in circulation and held outside of the U.S. Treasury, Federal Reserve banks, and vaults of depository institutions. By yearend 1996, U.S. currency held abroad had grown to $209.6 billion, or 53 percent of the $398.0 billion of U.S. currency in circulation (table 3).

The new measure of net currency flows is believed to represent nearly all the currency

Table 3.—U.S. Currency, 1973–1996

[Millions of dollars]

	Net flows to foreigners	Foreign holdings at yearend	Currency in circulation at yearend [1]
1973	n.a.	30,500	61,929
1974	1,100	31,600	68,188
1975	1,500	33,100	74,138
1976	1,500	34,600	80,967
1977	1,900	36,500	89,043
1978	3,000	39,500	97,963
1979	3,000	42,500	106,882
1980	4,500	47,000	117,379
1981	3,200	50,200	124,641
1982	4,000	54,200	134,805
1983	5,400	59,600	148,604
1984	4,100	63,700	158,444
1985	5,200	68,900	170,187
1986	4,100	73,000	183,050
1987	5,400	78,400	199,272
1988	5,800	84,200	214,816
1989	5,900	90,100	225,333
1990	18,800	108,900	249,491
1991	15,400	124,300	269,916
1992	13,400	137,700	294,965
1993	18,900	156,600	324,848
1994	23,400	180,000	357,460
1995	12,300	192,300	376,187
1996	17,300	209,600	397,945

1. Measured as a component of U.S. money stock.
n.a. Not available

3. Richard D. Porter and Ruth A. Judson, "The Location of U.S. Currency: How Much Is Abroad?" *Federal Reserve Bulletin* (October 1996): 883–903. Similar empirical research and approaches to measurement were also applied to Germany; see Franz Seitz, *The Circulation of Deutsche Mark Abroad*, Economic Research Group of the Deutsche Bundesbank (May 1995). See also Douglas B. Weinberg, "U.S. International Transactions, Second Quarter 1996," Survey 76 (October 1996): 99–100.

transactions that occur through wholesale banking channels. Currency that flows abroad through other channels—through tourists, through business persons, through personal remittances, and through U.S. military personnel stationed overseas—is not covered in this estimate. Currency smuggled and other illegal activities involving cash, such as drug trafficking, are also not covered in this estimate.

Partial estimates of U.S. currency held by foreigners and changes in those holdings were included in the international accounts and the international investment position of the United States from 1946 to 1962 (see Samuel Pizer and Frederick Cutler, "U.S. International Investments," Survey 43 (August 1963)). The estimates were discontinued when they were discovered to be unreliable and inaccurate. Currency flows at that time were based on a Federal Reserve survey of currency shipments through banks, a Census Bureau report of exports and imports of silver coins, periodic information on the U.S. Treasury's currency shipments, and estimates of U.S. currency spent abroad by U.S. troops. Growing uncertainty over the coverage and quality of measurement led to the series' termination, partly because evolving geographic statistical patterns appeared to be seriously out of line with actual developments.

Financial services

Estimates of financial services are further improved from last year's introduction of the comprehensive benchmark survey for 1994 by this year's introduction of preliminary results from the 1995 and 1996 Annual Survey of Financial Services Transactions Between U.S. Financial Services Providers and Unaffiliated Foreign Persons.

The new annual surveys provide coverage comparable to that of the benchmark survey (which included nearly a dozen types of financial services), but in consideration of statistical reporting burden, the exemption level in the annual survey is raised to $5.0 million from $1.0 million in the benchmark survey. The loss in coverage due to the higher exemption level is recovered by statistical estimation of the exempt companies' transactions in nonbenchmark years. In addition, because the follow-on annual surveys, like the benchmark survey, cover only explicit fees paid and received, BEA continues to estimate fees paid and received on bond trading, which are not separately identifiable and consequently can not be reported.[4]

The largest revisions for 1995 and 1996 to both receipts and payments were to underwriting and private placement fees and, to a lesser extent, to financial management fees and financial advisory fees. The revisions resulted largely from a substantial step-up in financial activity in both 1995 and 1996 from levels of the 1992–94 period upon which extrapolations were based. In contrast, preliminary estimates for brokerage commission receipts and payments were close to the revised estimates.

Despite the underestimation, the basic approach of extrapolation from the benchmark year using activity and fee-rate variables to produce current estimates until annual survey results can replace them still appears sound. In the future, the approach will be maintained, but the availability of annual surveys will permit the estimates for each type of financial service to be adjusted more promptly.

The annual surveys confirm the benchmark survey findings that much financial service activity takes place outside affiliated channels and that at least for the United States, it is necessary to survey transactions with unaffiliated foreigners in order to obtain complete coverage of financial services.

Estimates of receipts were revised up $0.9 billion, to $7.0 billion, for 1995 and up $0.4 billion, to $8.0 billion, for 1996. Estimates of payments were revised up $0.8 billion, to $2.5 billion, for 1995 and up $1.2 billion, to $3.2 billion, for 1996.

Benchmark survey of foreign direct investment in the United States

Results of BEA's 1992 benchmark survey of foreign direct investment in the United States are introduced for 1992. For years after 1992, the estimates are revised by extrapolating forward the 1992 universe data and by incorporating new or adjusted data from BEA's quarterly sample surveys for 1993–96. Previously, the estimates for 1992 forward were extrapolated from the 1987 benchmark survey and sample surveys for 1993–96.

The 1992 benchmark survey covers the universe of U.S. affiliates of foreign direct investors. In nonbenchmark years, universe estimates of the direct investment position and related capital, investment income, and services flows are derived from data reported quarterly by a sample of affiliates and from estimates for affiliates not in the

4. See Christopher L. Bach, "U.S. International Transactions, Revised Estimates for 1986–95," Survey 76 (July 1996).

sample. The estimates for affiliates not in the sample are derived by extrapolating data from the benchmark survey using a matched sample of data from reporting affiliates.

Direct investment capital.—Net capital inflows for foreign direct investment in the United States are revised for 1992–96 to incorporate the results of the 1992 benchmark survey and new or adjusted data from the sample surveys for 1993–96. In addition, a recalculation of permanent invested capital in unincorporated bank affiliates, using more detailed source data, resulted in revisions for 1992 and 1993. The revisions for 1993–96 also reflect revised estimates of depreciation, depletion, and expensed exploration and development costs, which are used to adjust the reinvested earnings component of capital to a current-cost basis. Net capital inflows are revised up $0.3 billion for 1992, up $6.0 billion for 1993, down $4.1 billion for 1994, up $7.3 billion for 1995, and down $7.0 billion for 1996.

A more complete explanation of the revisions will accompany the presentation of the detailed estimates of foreign direct investment in the United States in the September 1997 SURVEY.

Direct investment income.—Net payments of income by U.S. affiliates to their foreign parents are revised for 1992–96 to incorporate the results of the 1992 benchmark survey and new or adjusted data from the sample surveys for 1993–96. The revisions for 1993–96 also reflect revised estimates of depreciation, depletion, and expensed exploration and development costs, which are used to adjust the earnings component of direct investment income to a current-cost basis, and revisions to related withholding taxes. Net income payments are essentially unrevised for 1992 and 1993 and were revised down $1.1 billion for 1994, down $1.1 billion for 1995, and down $1.7 billion for 1996.

Royalties and license fees payments and receipts, affiliated.—Payments and receipts of royalties and license fees between U.S. affiliates and their foreign parents (and foreign affiliates of their foreign parents) are revised for 1992–96 to incorporate the results of the 1992 benchmark survey and new or adjusted data from the sample surveys for 1993–96. For 1992, U.S. affiliates' payments and U.S. affiliates' receipts were essentially unrevised.

Other private service payments and receipts, affiliated.—Payments and receipts for other private services between U.S. affiliates and their foreign parents (and foreign affiliates of their foreign parents) are revised for 1992–96 to incorporate the results of the 1992 benchmark survey and new or adjusted data from the sample surveys for 1993–96. For 1992, U.S. affiliates' payments are revised down $0.1 billion, and U.S. affiliates' receipts are revised up $0.2 billion.

Benchmark survey of selected services

The estimates for 1996 incorporate the preliminary results of BEA's 1996 Benchmark Survey of Selected Services Transactions with Unaffiliated Foreign Persons. The survey covered a number of business, professional, and technical services and is one of many quinquennial benchmark surveys that are a regular part of BEA's ongoing benchmark survey program. Services covered were primarily advertising, computer and data processing, database and other information services, and management, legal, and construction and engineering services. In addition, to fill data gaps in new, growing, and volatile services categories, this benchmark survey covered a number of other services for the first time: Financial services by firms that are not financial services providers (purchases only); selling agent services; and "other" private services, such as satellite photography, security services, actuarial services, salvage services, oilspill and toxic waste cleanup services, language translation services, and account collection services. (These services had previously been covered in annual surveys but not in a benchmark survey). The survey was required from each U.S. person who had transactions (either sales or purchases of any of the covered services) in excess of $500,000 with unaffiliated foreign persons.

For 1996, $0.4 billion in receipts and $0.2 billion in payments are added to the accounts.

Transportation estimates

Truck freight receipts and payments.—Estimates of freight charges for the transportation of U.S. goods exports by truck between the United States and Canada are revised for 1995 and 1996, based on newly available source data.

Beginning in April 1995, the Bureau of the Census began collecting and providing to the Department of Transportation survey data on freight charges for the transportation of U.S. goods exports by truck between the United States and Canada. The survey data now replace BEA projections that were previously used to estimate truck freight receipts and payments. (Survey data for freight charges on U.S. goods imports from

Canada were available at the time the estimates were introduced in 1995.)

For 1995, the revision raised truck freight receipts by $0.2 billion and reduced truck freight payments by $0.2 billion. For 1996, the revision raised truck freight receipts by $0.2 billion and reduced truck freight payments by $0.3 billion.

Ocean port receipts.—Estimates of foreign-operated ocean carriers' expenses in U.S. ports are revised for 1992–96 to incorporate details now available from BEA's survey of ocean transportation. The new details identify the types of primary expenses incurred in U.S. ports by foreign ocean carriers.

Primary expenses include port call expenses (pilotage, towing, and tugboat), cargo expenses (stevedoring, container and barge rentals, and warehouse), vessel expenses (stores and supplies, vessel repairs, and officer and crew wages), and other expenses (agents' and brokers' fees and expenses relating to maintaining U.S. offices). The estimates of these nonfuel expenses are based on the annual BEA survey "Foreign Ocean Carriers' Expenses in the United States." From the annual reports, a per ton expenditure "rate" is calculated for each type of nonfuel expense and for each type of carrier (liner, tanker, and tramp). These implied per ton expenditure "rates" are used in conjunction with Bureau of the Census data on import and export tonnage of foreign-operated ocean carriers to calculate total expenses.

Previously, no detail by type of primary expense was available; consequently, estimates were developed only at the aggregate level. Estimates based on type of primary expense yield substantially lower estimates of foreign-operated ocean carriers' expenses in U.S. ports than estimates based on aggregate port expenses.

Separate enumeration of different types of port expenses also permits a more direct method of estimation of fuel expenses. Estimates of fuel expenses are now based on the Bureau of the Census quarterly report "Bunker Fuel Laden on Vessels Cleared for Foreign Countries." Previously, the estimates of fuel expenses were based on indirect methods of estimation because they could not be separated from other expenses reported on BEA's survey.

Estimates of primary expenses and of fuel for each type of service are summed to total ocean port services receipts. Downward revisions to ocean port services receipts range from $1.1 billion for 1992 to $2.3 billion for 1996.

Earnings and expenditures of temporary workers

Migratory workers.—Earnings and expenditures of foreign residents employed temporarily in the United States are revised for 1986–96 to include the earnings of "undocumented" migrant agricultural workers, mostly from Mexico. These migrant workers are employed in the United States 23 weeks a year, on average, to assist in the growing and harvesting of crops. Until now, no estimates of earnings and expenditures of "undocumented" migrant agricultural workers have been included in the accounts.

Only the earnings and expenditures of "undocumented" migrant agricultural workers are included in the new estimates. Earnings and expenditures of nonagricultural Mexican and Canadian residents who commute to work and are employed in the border areas of the United States are already included in the "other" private services accounts. Resident immigrants, who also earn income and make expenditures, are considered residents of the United States; the share of their earnings that is sent abroad is included in personal remittances.

The estimation methodology for "undocumented" migrant agricultural workers uses biennial data from the U.S. Department of Labor's National Agricultural Workers Survey (NAWS) and data from the U.S. Department of Agriculture's Quarterly Agricultural Labor Survey (QALS). The NAWS survey, which is based on interviews with agricultural workers for the years 1989–95, covers crop workers (nursery, cash grains, field crops, and fruits and vegetables) and excludes livestock, poultry, and animal fodder workers. The QALS is a telephone survey of farm employers taken four times a year.

Several steps are necessary to combine the information from the two data sources. First, an estimate of total crop workers is calculated by extrapolating the number of total crop workers in 1991 from the NAWS by the total QALS employment of farm labor and agricultural service workers. Second, "undocumented" migrant workers are calculated by multiplying the NAWS percentage of crop workers who are migrants and the NAWS percentage of migrants who are "undocumented" times the total number of crop workers. Third, the number of "undocumented" migrant workers is multiplied by the average hours worked per quarter from the NAWS and the average hourly earnings, less withholding, from the QALS, to calculate earnings. It is assumed that 55 percent of earnings are spent in the United States.

Revisions are made for 1986–96. For 1996, $2.0 billion is added to earnings, and $1.1 billion is added to expenditures. For 1986, $0.7 billion is added to earnings, and $0.4 billion is added to expenditures.

Professional workers.—Earnings and expenditures of foreign residents employed temporarily in the United States are revised to include the earnings of self-employed foreign professionals—such as artists, athletes, consultants, and teachers. Estimates of their earnings are based on data from the Internal Revenue Service. It is assumed that 40 percent of professionals' earnings are spent in the United States. (Earnings and expenditures of professionals working in the United States for foreign corporations are included in the direct investment services accounts.)

Revisions are made for 1986–96. For 1996, $0.5 billion is added to earnings, and $0.2 billion is added to expenditures. For 1986, $0.1 billion is added to earnings, and the amount added to expenditures is very small.

Currency translation gains and losses

Improved measures of U.S. banks' own claims and liabilities denominated in foreign currencies are introduced for 1992–96. An adjustment is made that improves the quality of the estimates by removing unrealized currency translation gains and losses from U.S. banks' capital flows. These gains and losses occur because foreign-currency-denominated assets and liabilities are reported in dollar equivalents, thereby giving rise to apparent transactions any time that exchange rates at the end of 1 month differ from those at the end of the next month. Because foreign-currency-denominated positions have increased in size in recent years, fluctuations in the positions attributable to exchange rate movements have become large enough to significantly distort the measure of capital transactions. Therefore, the dollar-equivalent amounts will now be adjusted to remove unrealized gains or losses, which should more appropriately be considered as valuation adjustments in the net U.S. international investment position. Bona fide capital transactions, as well as foreign exchange gains and losses that are realized, will then constitute capital flows in the balance of payments accounts. The adjustment is made on the basis of banking data collected by the Bank for International Settlements (BIS).

The improved flow estimates for U.S. banks' own foreign-currency-denominated claims and liabilities are derived by applying the distribution of foreign currencies in the BIS banking data to the positions reported in the Treasury International Capital (TIC) reporting system at the beginning and end of quarters in order to compute the dollar amount of TIC outstandings held in each of nine key currencies—the British pound, Japanese yen, German mark, Swiss franc, French franc, Italian lire, Canadian dollar, the European Currency Unit (ECU), and the Special Drawing Right (SDR) (for less developed countries that transact largely in nondomestic currencies).

The TIC dollar-reported outstandings for each of the nine currencies are then converted into domestic currency units using end-of-period exchange rates. The difference between the beginning- and end-of-period positions constitutes the estimated capital flow for each currency in domestic units. The flow for each of the nine currencies is then converted back into dollars using quarterly average exchange rates, and the nine values are summed to compute global capital flows excluding exchange rate gains and losses.

The global flow without exchange gains and losses is then subtracted from the global TIC capital flow with gains and losses; the difference equals the exchange rate gains and losses incurred during the period. Representatives in the banking industry suggest that about 25 percent of the computed gains and losses are realized in a typical quarter and are thus appropriately included in capital flows; therefore, only the 75 percent that represent the unrealized exchange gains and losses are removed from the TIC-reported capital flow.

Unrealized gains and losses are removed from U.S. banks' foreign-currency-denominated flows for 1992–96. The adjustments for foreign currency claims ranged in size from −$3.1 billion in the third quarter of 1995 to $3.3 billion in the first quarter of 1995; the revisions were negative when the dollar appreciated and positive when the dollar depreciated. The adjustments for foreign currency liabilities ranged in size from −$4.3 billion in the first quarter of 1995 to $4.1 billion in the third quarter of 1995; the revisions were positive when the dollar appreciated and negative when the dollar depreciated. In many quarters, the changes were considerably smaller.

The improved estimates do not cover U.S. banks' customers' claims denominated in foreign currencies, because the currency composition of these asset holdings is not available.

Nonbank claims and liabilities

Beginning with estimates for the first quarter of 1997, BEA is including estimates of capital flows for U.S. nonbank claims on and liabilities to unaffiliated foreigners in its preliminary estimates for the current quarter. The last time these capital flows had been included in the preliminary estimates was the fourth quarter of 1978.

Revisions to the Treasury Department's reporting forms at yearend 1978 extended the reporters' filing date, which made data unavailable to BEA for the preliminary estimates. From the first quarter of 1979 onward, BEA has published an "n.a." (not available) for these capital flows in the current quarter because it had no basis on which to make a reliable and accurate estimate.

In recent years, financing activity and capital flows in these accounts, particularly with Caribbean finance centers, have become large and significant. Consequently, BEA began exploring data sources that would provide the basis for a timely estimate of these capital flows. The Federal Reserve Board has made available to BEA preliminary data from its reports of offshore banks' asset and liability positions with U.S. banks and nonbanks.

BEA's estimates are based on changes in the Caribbean banks' asset and liability positions with U.S. nonbanks. Although U.S. nonbank flows with banks in the Caribbean are a major part of total U.S. nonbank flows, a substantial part of U.S. nonbank flows remains uncovered. There are no acceptable source data upon which to base reliable preliminary estimates of transactions with other areas of the world.

Because of this difficulty, it is expected that there will be large revisions between preliminary and revised estimates. However, these revisions should be smaller than those under the old procedure, which implicitly assumed that nonbank flows were zero for the preliminary estimates.

The new procedure is used only for the preliminary estimates. For the revised estimates published 90 days later, normal estimation procedures based on complete survey results from several data sources will continue to be used.

Goods

BEA and the Bureau of the Census seasonally adjust the goods export and goods import estimates at the five-digit end-use commodity category levels, which is the most detailed level of end-use classification available. This level of detail is chosen because of the need to track specific trade patterns and to relate those patterns to categories of final demand included in the national income and product accounts. Nearly 150 commodity categories are tested annually for seasonal variation. Almost 80 percent of total export value and almost 90 percent of total import value exhibit stable seasonality.

An aggregate series that is derived as the sum of individually seasonally adjusted series may in some instances exhibit "residual" seasonality. The amount of "residual" seasonality is usually small, and no adjustments are made to the aggregate series, because of a strong preference to have as accurate as possible measures for each of the individual series and to have individual series that sum to the aggregate series. However, in recent years, the amount of "residual" seasonality for exports has increased. Consequently, a concerted effort was made this year to reduce the "residual" seasonality for goods exports. Little "residual" seasonality exists for good imports.

For exports, "residual" seasonality is traceable mostly to the commodity categories of civilian aircraft and parts and of industrial, service, and agricultural-type machinery. The component series of civilian aircraft and parts contain large amounts of irregular and nonsystematic variation, which make it difficult to detect whether a pattern of stable seasonality exists. Given the difficulty in determining reliable seasonality in this series, this problem seems rather intractable, and civilian aircraft and parts can be expected to continue as a contributor to "residual" seasonality in total exports. However, some progress has been made with the machinery category. By combining several of the individual machinery series into a single category and by developing seasonal factors based on that single category, rather than on each component series separately, it was possible to reduce significantly "residual" seasonality in total exports. This combination of individual machinery categories will be reevaluated at the time of next year's annual revision. Staff at the Bureau of the Census' Foreign Trade Division conducted this research.

A number of additional series are adjusted for seasonal or for trading-day variations for the first time this year, which also helps reduce the "residual" seasonality of total exports.

BEA and the Census Bureau seasonally adjusted end-use series continue to sum to seasonally adjusted total exports and total imports.

Nonresident taxes

Net tax payments to foreigners are revised for 1985–95 to reflect a higher level of income from abroad and to reflect a change in assumed foreign withholding tax rates. Taxes on dividends were raised $1.3 billion for 1996, reflecting the higher level of income receipts that resulted from upward revisions to U.S. holdings of foreign stocks. Taxes on bond interest were lowered $3.8 billion for 1996, as higher taxes resulting from upward revisions to U.S. holdings of foreign bonds were more than offset by the effect of a reduction in the assumed foreign withholding tax rate on bond interest income.