

Chapter 7

Bilateral Time-Series Trade Data

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7.1 Commodity Classification

The underlying commodity classification used for the international categorization of goods has changed several times in the past four decades. Commodity classifications have become increasingly more detailed. The Harmonized System (HS) classification is well suited for mapping commodity trade to the GTAP sector definitions. From 1962 to 1989, all trade was categorized based on the Standard International Trade Classification (SITC). There were 3 revisions of SITC during this period. The HS replaced the SITC and is now widely used by most countries today. The problem in creating a time-series for GTAP is that there is an imperfect correspondence between the early versions of SITC and the current GTAP sectoral classification. A common problem is an inadequate distinction between the raw and processed commodities. This is a problem affecting agricultural and processed food sectors. In manufactures, mineral products and electronic equipment are imperfectly mapped in the time-series data. Certain electronic components are not distinguished from other machinery and equipment.

7.2 Time-series Flows and Margins

Margins data are not available for the 1965-98 time-series. Detailed transport margins used in the base year were based on a detailed HS classification. The United States did not include this type of transportation data in the trade flow data until 1990. It was therefore not possible to generate consistent transport margins data prior to 1990.

7.3 Unavailable Countries in Time-series Data

Some individual countries in the version GTAP 5 data base are missing in the GTAP time-series data. This is because they belong to a statistical reporting region in the U.N. COMTRADE data base. Countries of the South African Customs Union are reported in this data base as a single reporting unit and as an aggregate partner. Data for Botswana was obtained for the base year period only. No attempt was made to create a time-series data set for Botswana. The same is true for Belgium and Luxembourg. Their trade data are reported as a statistical region in the COMTRADE data base. It was not until 1999 when trade data for these countries were made available for the individual countries both as reporters and individual partners. Future versions of the time-series data may include separate trade flows for Belgium and Luxembourg.

7.4 Comparison with other Time-series Data

The value of global merchandise trade in the GTAP time-series is consistently lower than world trade based on balance of payment (BOP) estimates from individual countries. A comparison for the 1975 to 1998 period is provided in table 7.1. Prior to 1992 the difference was generally less than 5 percent but has increased in later years to 10 percent. Re-exports, under-reported intra-regional trade, and non-reporting largely account for the difference.

World trade has grown rapidly with the growth of China's trade but even more so because of the large share of its trade that is re-exported. When re-exports are included in individual country trade, as is done for the balance of payment estimates, there is double counting. This suggests that over time there will be larger discrepancies between GTAP's trade levels and trade total from other sources. China's exports to Hong Kong are counted once but then counted again when Hong Kong exports the same goods to a third country. Since re-exports are not allowed in the GTAP data base

the global level of trade will be lower than other estimates for the world. Re-exports are placed on a direct trade basis by being exported from the primary origin to the final destination.

Table 7.2 provides a comparison of merchandise export totals for China, Hong Kong, and Singapore. In the GTAP time-series, China's exports are consistently higher during the 1990s than the estimates derived from the balance of payment approach. One reason is that China's trade with Hong Kong is reported by Hong Kong rather than by China. For re-exporting countries, the opposite is true. This discrepancy between the two series has grown. In recent years Hong Kong's exports from balance of payment estimates are 7 times larger than the level found in GTAP. And for Singapore, exports are nearly 30 percent larger than in GTAP in the last 3 years of the data series. This is primarily due to the exclusion of re-export trade.

The largest inconsistencies in the two time-series are found in low-income developing countries. Examples of this are shown in table 7.3. There is not always an obvious reason for such large differences. One reason is the fact that these countries have a sporadic reporting record and that when there is unreported trade it must be estimated by alternative means with less certainty. During the late 1980s and early 1990s, GTAP's trade levels for Mozambique were more than twice the level of the balance of payment estimate. The pattern is different for Uganda where the time-series balance of payment estimate is intermittently higher.

The differences between the two series for developed countries are much less than for other countries. Examples are given in table 7.4. For Germany, the balance of payment estimate is generally higher by 5 percent or less. However, in the last 3 years of the series it is likely that under-reporting of exports with other EU members is a reason for the difference to increase to 10 percent. For Japan, the GTAP series is consistently higher than the balance of payment estimates. There are few, if any, problems of non-reported trade or under-reporting in Japan's reported trade statistics for bilateral commodity trade.

Table 7.1 Comparison of Global Merchandise Trade for Balance of Payment Estimates and GTAP (in \$ billions)

Year	Balance of Payments (BOP)	GTAP Time-series	BOP / GTAP-TS
1975	845	797	1.06
1976	948	912	1.04
1977	1,073	1,040	1.03
1978	1,237	1,205	1.03
1979	1,575	1,523	1.03
1980	1,909	1,854	1.03
1981	1,900	1,833	1.04
1982	1,756	1,679	1.05
1983	1,716	1,652	1.04
1984	1,832	1,758	1.04
1985	1,844	1,784	1.03
1986	2,024	1,948	1.04
1987	2,395	2,315	1.03
1988	2,757	2,631	1.05
1989	2,978	2,870	1.04
1990	3,409	3,302	1.03
1991	3,508	3,386	1.04
1992	3,765	3,752	1.00
1993	3,745	3,720	1.01
1994	4,244	4,199	1.01
1995	5,103	4,907	1.04
1996	5,343	4,866	1.10
1997	5,545	5,022	1.10
1998	5,447	4,913	1.11

Source: Balance of payment estimates from 2001 World Development Indicators

Table 7.2 Comparison of Total Merchandise Exports for China, Hong Kong, and Singapore (in \$ millions)

Year	China			Hong Kong			Singapore		
	BOP	GTAP-TS	BOP / GTAP-TS	BOP	GTAP-TS	BOP / GTAP-TS	BOP	GTAP-TS	BOP / GTAP-TS
1982	21,125	18,438	1.15	19,790	13,389	1.48	21,016	22,987	0.914
1983	20,707	18,574	1.11	21,856	14,033	1.56	21,894	25,167	0.870
1984	23,905	21,234	1.13	20,986	17,137	1.22	24,091	26,560	0.907
1985	25,108	24,420	1.03	22,119	16,101	1.37	23,187	23,269	0.996
1986	25,756	27,806	0.93	28,324	19,211	1.47	22,738	23,625	0.962
1987	34,734	33,563	1.03	30,183	24,283	1.24	29,096	30,051	0.968
1988	41,054	41,973	0.98	35,437	27,612	1.28	40,703	41,171	0.989
1989	43,220	48,832	0.89	48,476	28,449	1.70	45,700	47,279	0.967
1990	51,519	57,631	0.89	63,165	28,590	2.21	54,679	55,534	0.985
1991	58,919	66,003	0.89	73,143	29,621	2.47	61,333	59,858	1.025
1992	69,568	83,387	0.83	82,151	30,845	2.66	66,565	66,009	1.008
1993	75,659	91,496	0.83	98,557	29,235	3.37	77,858	75,542	1.031
1994	102,561	118,036	0.87	119,487	29,517	4.05	97,919	99,416	0.985
1995	128,110	183,180	0.70	135,244	29,508	4.58	118,456	116,506	1.017
1996	151,077	191,627	0.79	151,399	26,750	5.66	126,010	97,661	1.290
1997	182,670	216,462	0.84	173,750	26,462	6.57	125,746	99,893	1.259
1998	183,529	222,760	0.82	180,750	23,849	7.58	110,591	88,223	1.254

Source: Balance of payment estimates from 2001 World Development Indicators

Table 7.3 Comparison of Total Merchandise Exports for Selected African Countries (in \$ millions)

Year	Mozambique			Uganda		
	BOP	GTAP-TS	BOP / GTAP-TS	BOP	GTAP-TS	BOP / GTAP-TS
1980	281	478	0.59	319	451	0.71
1981	281	323	0.87	229	273	0.84
1982	229	269	0.85	347	373	0.93
1983	132	213	0.62	368	342	1.08
1984	96	118	0.81	378	401	0.94
1985	77	112	0.68	383	404	0.95
1986	79	101	0.78	379	452	0.84
1987	97	206	0.47	384	322	1.19
1988	103	288	0.36	298	324	0.92
1989	105	355	0.30	282	291	0.97
1990	126	391	0.32	210	221	0.95
1991	162	350	0.46	176	170	1.04
1992	139	245	0.57	172	175	0.98
1993	132	161	0.82	157	135	1.16
1994	150	192	0.78	254	370	0.69
1995	169	216	0.78	595	594	1.00
1996	226	204	1.11	590	549	1.07
1997	230	240	0.96	671	516	1.30
1998	245	246	0.99	458	396	1.16

Source: Balance of payment estimates from 2001 World Development Indicators

Table 7.4 Comparison of Total Merchandise Exports for Germany and Japan (in \$ millions)

Year	Germany			Japan		
	BOP	GTAP-TS	BOP / GTAP-TS	BOP	GTAP-TS	BOP / GTAP-TS
1980	191,162	185,084	1.03	126,740	136,254	0.93
1981	174,153	172,136	1.01	149,520	156,909	0.95
1982	174,429	171,264	1.02	137,660	142,731	0.96
1983	167,488	164,326	1.02	145,470	152,190	0.96
1984	169,984	167,519	1.01	168,290	175,396	0.96
1985	182,692	180,009	1.01	175,461	183,414	0.96
1986	241,518	235,697	1.02	206,415	216,875	0.95
1987	291,489	287,381	1.01	225,515	244,956	0.92
1988	322,108	318,668	1.01	260,882	282,916	0.92
1989	340,101	336,212	1.01	270,994	291,760	0.93
1990	411,009	390,148	1.05	282,308	306,137	0.92
1991	403,985	389,387	1.04	308,168	334,184	0.92
1992	430,480	432,664	0.99	332,556	364,957	0.91
1993	382,678	377,908	1.01	352,661	389,134	0.91
1994	430,544	428,090	1.01	385,698	427,391	0.90
1995	523,584	510,338	1.03	428,717	473,702	0.91
1996	522,579	483,996	1.08	400,279	417,756	0.96
1997	510,715	476,042	1.07	409,240	424,397	0.96
1998	542,801	495,582	1.10	374,044	395,844	0.94

Source: Balance of payment estimates from 2001 World Development Indicators