

## B SELECTED TRADE DEVELOPMENTS AND ISSUES

### 1. TEN YEARS OF THE INFORMATION TECHNOLOGY AGREEMENT, 1996-2006

#### (a) Introduction

In December 1996, at the first WTO Ministerial Conference held in Singapore, 23 economies signed the Information Technology Agreement (ITA). The objective of the ITA was to “encourage the continued technological development of the information technology industry on a world-wide basis” and to “achieve maximum freedom of world trade in IT products” by eliminating all duties on trade in these products. Lower barriers to trade should help to spread “the positive contribution of IT to global economic growth and welfare”.<sup>1</sup> The ITA went into force in 1997, when the trade value of the participants exceeded 90 per cent of world trade in the covered products – the benchmark stipulated in the Agreement. Ten years on, the information and communication industry is seen as a major engine of the globalisation process, transforming both the developed and developing economies. The rapid development of the internet (1 billion users in 2005) and the global spread of cellular mobile telephony (2.1 billion subscribers in 2005) are two prominent examples of the increased role of IT in today’s global economy.<sup>2</sup> The spread of IT technologies has created many new business opportunities, transformed many services sectors and challenged many old patterns of production and distribution.

The elimination of tariffs on IT products<sup>3</sup> contributed to this rapid development of the IT sector. While bound and applied tariffs for IT products were already moderate in the major developed markets (most of them between 2 and 4 per cent) a large variation in tariff levels could be observed among developing economies. While some developing economies also had low bound and applied tariffs on IT products, others had tariff rates ranging above 10 per cent and a low level of bindings. For the latter group, the elimination of tariffs due to the ITA was a major step in market opening, attenuated to a degree by a staged implementation which lasted up to eight years in many cases (e.g. India, Malaysia and Thailand). Between 1997 and the end of April 2007, 33 more economies joined the ITA, bringing total membership of the agreement to seventy.<sup>4</sup> The share of ITA members in global exports and imports of IT products exceeded 97 per cent in 2005.

In what follows we provide an overview of tariff reductions that have taken place through the ITA, as well as a summary of trade flows in IT products by region, trader, and IT product category. Unfortunately, it is not possible to make an accurate estimate of the overall impact of the ITA on global trade in IT products. Such an estimate would have to take into account the absence of a precise starting point when all the commitments were fully implemented. Secondly, the impact of ITA tariff elimination is limited to imports subject to MFN tariff treatment and not to the trade flows subject to duty free preferential tariff treatment. Third, the period under review is characterized by strong variations in the business cycle with large swings among major exchange rates. Nominal trade flows in dollar terms are also affected by a marked downward trend in prices. Information on real trade flows (i.e. adjusted for price changes) is generally not available.

<sup>1</sup> Ministerial Declaration on Trade in Information Technology Products, Singapore, 13 December 1996, WTO document WT/MTN/(96)/16.

<sup>2</sup> According to the International Telecommunication Union (ITU), the number of internet users increased 13 times (from 74 million to 1 billion) and users of cellular mobile phones multiplied fifteen-fold times (from 145 million to 2.1 billion) between 1996 and 2005.

<sup>3</sup> In this review IT products are defined as those products covered by the Information Technology Agreement.

<sup>4</sup> Counting the EU(27) members separately.

## (b) Overview of ITA tariff cuts

In order to situate the tariff cuts made through the ITA in a wider framework one has to recall that these cuts were made on top of the reductions of bound rates agreed in the Uruguay Round (UR). The tariff commitments of ITA participants are laid down in specific ITA tariff schedules which indicate the initial (bound) tariff rate (thereafter called the "base rate") and the intermediate tariff rates for each year of the implementation period. The ITA base rate of a given tariff line corresponds – in general – to final bound tariff rates agreed in the UR. For an assessment of the actual tariff reductions recorded by traders, a distinction has to be made between bound and applied tariff rates. In many countries, in particular developing economies, one can observe that the final most-favoured-nation (MFN) bound rates of the UR are significantly higher than the MFN applied rates. In order to assess tariff cuts under the ITA it is therefore important to also look at the MFN applied rates prevailing at the time the ITA was concluded. Consideration must also be given to preferential rates applicable to major segments of international trade in IT products. The two most important categories of preferential trade flows are intra-RTA flows (such as the EU and NAFTA) and imports for processing in special economic zones, for which duty draw backs are granted.<sup>5</sup>

An overview of the tariff changes resulting from the ITA is provided by Table 1 below. This table shows that the tariffs on IT products (covered by the ITA) were somewhat lower on average than the average for all industrial products in 1996, in respect of both final bound and applied rates. As could be expected, applied rates on IT products were lower than the corresponding bound rates. For six major developed traders, the applied rates were more than 2 percentage points lower than the bound rates. As the result of the ITA, the arithmetic average bound rate of the six major developed importers declined from 4.9 per cent (and those of applied rates from 2.7 per cent) to zero. Looking only at the average rates conceals the fact that for some countries (including some developed countries) the highest tariffs for IT products were several times higher than the average applied rate.

As already noted, bound and applied tariffs for ITA products among developing country participants were in general considerably higher than in the industrial countries. The major exceptions were Hong Kong, China and Macao, China which already had duty free trade in ITA products before the agreement went into force. Singapore had final bound rates of 13 per cent for IT products, but the average applied rate was zero. From the data available it seems that the largest reductions of pre-ITA applied rates were implemented by India, China, Jordan and the Republic of Korea.

Table 1 also shows the number of duty free rates in existence before and after the ITA. In the developed countries, about two-thirds of IT products which still carried duties after the UR were made duty free thanks to the ITA. The increase of duty free tariff lines differed considerably among the developing countries – from no increase in the case of Hong Kong, China to more than 200 new duty free tariff lines in the case of China, India, Malaysia and Chinese Taipei.

The impact of the ITA on the participants' tariff schedules as a whole is indicated by the share of ITA tariff lines in all duty free tariff lines for industrial products. While for the developed participants this share is in a range of 5 per cent to 17 per cent, the corresponding shares for developing participants are much higher. For six out of 17 developing country participants reported in Table 1 the share is 100 per cent or very close to that share.

<sup>5</sup> In 2005, the intra-trade of the EU(25) and of NAFTA combined accounted for 37 per cent of world exports of manufacturers. More than one-half of China's imports of manufactures are destined for processing in special zones and re-export, and are exempt from duties.

**Table 1**  
**Information Technology Agreement (ITA) tariffs of selected economies**

	Year ITA start	Year ITA final impl.	No of duty free ITA tariff lines		Average tariff rates <sup>a</sup>			Share of ITA prod. in duty free final bound tariffs of non-agric.	Average non-agric. prod.	
			Final bound UR	ITA base rates (1996)	ITA base rate (TL)	Pre- ITA rate appl.r. <sup>b</sup>	ITA final bound rates		Final bound	Appl. rates <sup>b</sup>
<i>Developed participants</i>										
Australia	1997	2000	9	190	12.1	3.3	0	19.7	11.0	3.9
Canada	1997	2000	69	345	4.3	3.4	0	12.0	5.3	3.7
EU(15)	1997	2000	69	358	4.0	3.9	0	14.2	3.9	3.9
Japan	1997	2000	145	332	1.0	0.1	0	10.1	2.8	2.8
Norway	1997	2000	15	226	5.2	2.4	0	8.6	3.2	0.6
United States	1997	2000	81	327	2.8	2.8	0	7.4	3.3	3.3
Developed participants(6)			65	296	4.9	2.7	0	...	4.9	3.0
<i>Developing participants</i>										
China	2001	2005	14	317	6.5	12.7	0	55.9	9.1	9.2
Costa Rica	1997	2005	...	270	6.0	5.0	0	100.0	42.9	4.9
Egypt	2003	2007	...	190	13.0	12.1	0	99.0	27.7	12.5
El Salvador	1997	2005	213	192	1.2	3.2	0	100.0	35.7	5.0
Hong Kong, China	1997	1997	168	168	0.0	0.0	0	11.1	0.0	0.0
India	1997	2005	...	217	66.4	36.3	0	99.5	36.7	16.4
Indonesia	1997	2005	99	216	5.9	4.7	0	100.0	35.6	6.8
Israel	1997	2005	150	358	5.1	4.2	0	50.8	11.3	4.9
Jordan	2000	2005	-	248	19.5	9.4	0	51.5	15.2	10.4
Korea, Rep. of	1997	2004	...	386	14.4	7.9	0	27.5	10.2	6.7
Macao, China	1997	1997	255	255	0.0	0.0	0	31.6	0.0	0.0
Malaysia	1997	2005	2	237	12.4	4.1	0	66.4	14.9	7.9
Morocco	2004	2010	...	210	12.8	11.9	0	98.6	39.2	21.2
Saudi Arabia	2005	2008	...	199	5.8	...	0	28.0	10.5	4.8
Singapore	1997	2000	58	253	13.2	0.0	0	28.5	6.3	0.0
Taipei, Chinese	1997	2002	29	253	4.7	4.8	0	12.4	4.8	4.7
Thailand	1997	2005	...	194	30.9	...	0	99.5	26.9	8.3
Turkey	1997	2000	...	365	24.9	4.2	0	86.5	17.1	4.7
<i>Developing non participant</i>										
							appl. rates			
Brazil	-	-	-	-	31.7	17.2	10.1	-	30.8	12.6
Mexico	-	-	-	-	34.8	11.8	9.7	-	34.9	13.3
South Africa	-	-	-	-	11.5	2.2		-	15.8	7.9

<sup>a</sup> Averages of base rates are calculated on tariff line level while those of applied rates are based on HS 6 digit subheadings. Pre-ITA applied rates refer in general to the year prior to the ITA participation (for initial participants the year 1996). For non-participants the applied rate for ITA products refer to the following years: Brazil 1997 and 2006, Mexico 1998 and 2004 and South Africa 2000.

<sup>b</sup> Refers to year 2006 or 2005, except for Indonesia (2003).

Source: WTO, IDB database.

## (c) World trade developments in IT products<sup>6</sup>, 1996-2005

### *IT trade at the global level*

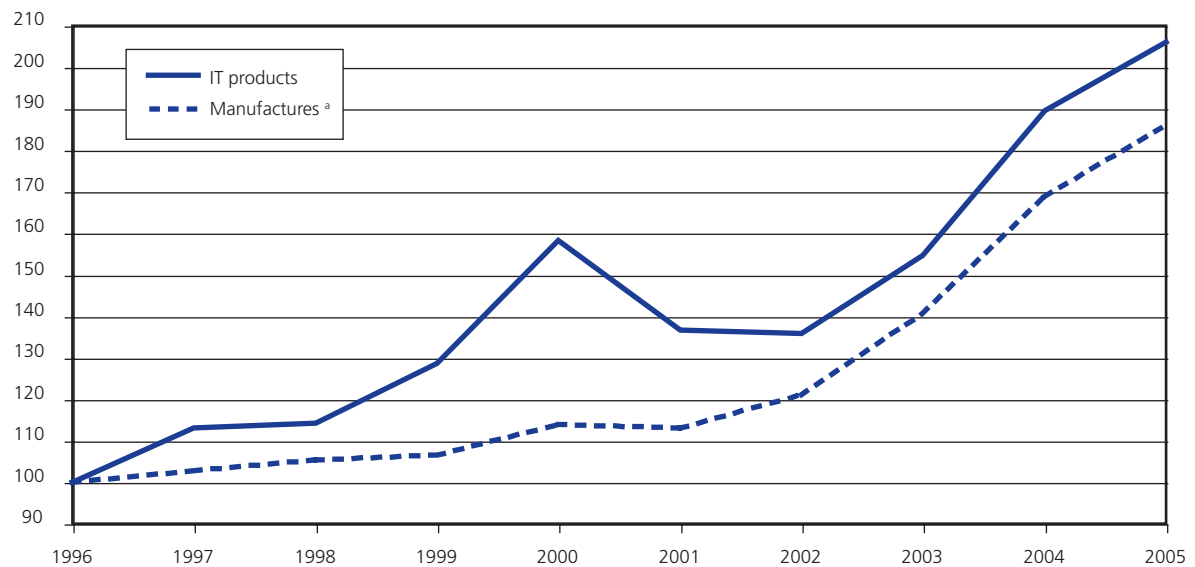
World exports of ITA products have more than doubled in dollar terms between 1996 and 2005 (Chart 1). The annual average growth rate was 8.5 per cent over this nine year period and the value reached \$1450 billion in 2005. In that year, IT products accounted for 14 per cent of world merchandise exports, thereby exceeding the combined global exports of agricultural products, and textiles and clothing.<sup>7</sup>

The expansion of IT trade over the nine year period was uneven. From 1996 to 2000 a strong annual rise of 12 per cent was recorded for global IT exports. Thereafter, the burst of the internet bubble caused trade in IT products to shrink sharply in both 2001 and 2002, followed by a recovery in the subsequent three years. Comparing trade in IT products with that of other manufactured goods, it appears that growth in IT product trade exceeded other manufactured goods trade in the 1996-2000 period, but lagged somewhat in the 2000-05 period.

Chart 1

### The expansion of world exports of IT products and other manufactures, 1996-2005

(Indexes, 1996=100)



<sup>a</sup> Excluding IT products.

Source: UN, Comtrade database.

Nominal dollar values, however, understate the absolute and relative strength of trade growth in IT products. Prices for computers, semi-conductors and telecom equipment have recorded a general downward trend, while those of other manufactured goods increased moderately. The price developments of US imports illustrate this. Between 1996 and 2005 the prices of IT products decreased on average by 6 per cent annually while those of all other manufactured goods increased by nearly 1 per cent annually.

<sup>6</sup> As defined by the Information Technology Agreement. There are some difficulties in precisely measuring trade in IT products as the definition provided in the Agreement cannot always be clearly matched with national tariff schedules. For example, some IT products are grouped together with other non-IT products in tariff and trade classifications. Including all tariff lines embodying IT products and other products overstates the "true" product coverage and excluding them understates the trade flows. The world total of IT trade based on the broader definition expands somewhat less rapidly and is about 10 per cent larger than the trade based on the narrow definition. In this review we opted for the somewhat overstated coverage which principally affects semiconductor equipment.

<sup>7</sup> In this review of global IT trade the standard regional definitions used in the WTO International Trade Statistics are applied. This implies that intra-EU trade is included and that the re-exports of Hong Kong, China are excluded from the world total.

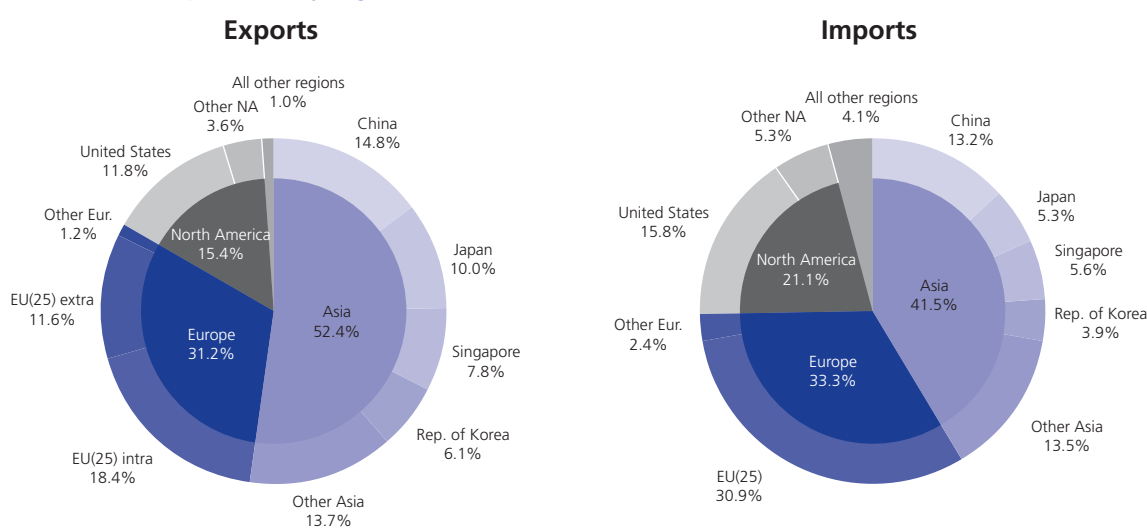
Given these relative price movements it is most likely that the real trade expansion of IT products was still more dynamic than that of other manufactured goods, not only in the 1996-2000 but also during the 2000-05 period.

Intra-NAFTA imports of the United States and Canada as well as intra-EU trade expanded over the entire nine years somewhat less dynamically than imports from traders outside the respective regional configurations. Excluding from the world total these trade flows, which did not benefit from the ITA because they were already duty-free, or might indeed have even been adversely affected by the ITA, one would observe an even stronger overall increase in IT exports between 1996 and 2005. While we have no precise way of measuring the contribution of the ITA to trade expansion during the first nine years of its operation, the existence of the agreement is unlikely have been incidental to this outcome.

### IT trade by region and leading traders

An outstanding feature of world trade in IT products is the prominent role played by Asia, which became more accentuated after the ITA entered into force in 1997 (Chart 2). Asian economies accounted for more than a half of world exports and more than 40 per cent of world imports of IT products in 2005. Intra-regional trade is substantial and competition among these economies for foreign investment and export markets is strong. The region and (most of) its leading traders are net-exporters of IT products. Europe's exports and imports of IT products are second only to those of Asia. Intra-EU(25) exports alone accounted for 60 per cent of Europe's total exports in 2005. Within Europe, the most dynamic traders are those which acceded to the EU in 2004 and which expanded their IT trade much faster than Ireland, the most dynamic trader among the EU(15) in the 1990s. The share of Europe in world IT exports and imports decreased moderately between 1996 and 2005. Imports of IT products of the region continue to exceed exports. North America's share in world trade of IT products decreased between 1996 and 2005, partly due to a shrinkage in intra-NAFTA trade after 2000. Intra-NAFTA trade in IT products accounted for somewhat more than 40 per cent of total North American IT exports. North America is a large net importer of IT products. IT exports of South/Central America, Africa, the Middle East and the CIS continue to have only a small share in world exports of IT products. These regions are net importers of IT products and although their imports were very strong in 2005 they still accounted for about 4.1 per cent of world IT imports.

**Chart 2**  
**World trade of IT products by region, 2005**



Source: UN, Comtrade database and WTO.

Major shifts can be observed in the shares of the leading traders of ITA products over the 1996-2005 period. The United States and Japan were the principal exporters of ITA products in 1996, but their exports expanded less rapidly than world exports before and after the burst of the internet bubble in 2001. These setbacks were sufficiently severe that in 2005 US IT exports were still below their peak level in 2000, while those of Japan only matched the level reached five years previously<sup>8</sup> (see Appendix Table 1).

Exports of the European Union (15) rose somewhat less rapidly than global IT trade over the 1996-2005 period. The deceleration after 2000 was less pronounced than on the global level, partly due to the strength of European exchange rates *vis-à-vis* the US dollar. An outstanding feature of IT trade in Europe was the divergent developments within the region. The Czech Republic, Hungary, Poland and other countries in the process of acceding to the EU benefited from the relocation to them of parts of the European IT production. As a consequence, these countries became dynamic exporters and importers of IT products and EU(15) intra-trade expanded far less rapidly than EU(15) trade with third countries (including the future members). The vigorous expansion of IT trade in new EU members was largely driven by the European integration process. The most evident case illustrating the benefits of integration is Hungary, which was not a participant in the ITA until 2004 and which had by far the strongest IT export growth in Europe over the 1996-2005 period (41 per cent annual average growth).

Among the leading traders, China has been by far the most dynamic exporter of IT products over the last decade. During the 1996-2000 period China's exports rose by 29 per cent annually, nearly three times faster than those of all other traders. Moreover, while global IT export growth slowed in the 2000-05 period, China's export of the products in question accelerated to nearly 40 per cent annually, more than 7 times faster than the rest of the world. China's share in world exports rose from 2.1 per cent in 1996 to 14.8 per cent in 2005. China ranked as the seventh largest exporter in 1996 and became the largest in 2005, if EU(25) intra-trade is not taken into account. If EU(25) intra-trade is taken into account, the EU(25) was the largest exporter of IT products in 2005.

The outstanding growth of China's exports of ITA products is closely linked to FDI inflows into China. Many globally operating firms, encouraged by low operating costs and attractive investment conditions, have increasingly added new production capacity in China. Investments originated not only from developed countries such as the United States and Japan, but prominently also from rapidly growing economies in East Asia such as Singapore, Chinese Taipei and the Republic of Korea. This shift in the location of the global information and communication industry in Asia contributed to the deceleration of export growth of some of the major developing exporters in Asia after 2000 (excluding China). Asian traders, such as Chinese Taipei, Malaysia, the Philippines and Indonesia recorded a loss in their share of world exports between 2000 and 2005. In contrast, the Republic of Korea succeeded in expanding its share and Thailand successfully maintained its share over this five year period.

Among the developing countries that do not participate in the ITA, Mexico is the most important trader. Its exports of IT products are largely destined for the US market (88 per cent in 2005), where Mexico enjoys duty free access owing to its NAFTA membership. Canada, a participant in the ITA and Member of NAFTA, somewhat reduced its dependence on the US market between 1996 and 2005. The trade performance of both countries is largely shaped by developments in the US market. They recorded export growth above the global average between 1996 and 2000, when the US market expanded very fast, and an export decrease between 2000 and 2005,<sup>9</sup> when US imports of IT products stagnated in value terms. For the entire 1996-2005 period, the two countries recorded an annual average increase in export value of IT products of 10 per cent and 2 per cent respectively.

<sup>8</sup> Japan's exports had recovered up to \$148 billion in 2004, but decreased in 2005.

<sup>9</sup> The rise of the US dollar against other major currencies up to 2000 and its subsequent decrease affected the shift in trade values.

In summing up the major shift in world exports of ITA products by trader over the 1996-2005 period, an outstanding feature was the rise of China. The increase in China's share in global IT trade was at the expense of the market shares of the United States and Japan. Among other leading exporters, only the Republic of Korea recorded an increase in its export share in the four years before the burst of the internet bubble (1996-2000) and in the five following years. In Europe, Hungary, the Czech Republic, Poland and the Slovak Republic all reported dynamic export growth throughout the 1996-2005 period.

Import developments by country between 1996 and 2005 show many similarities with those of exports. Among the major developed countries the United States, Japan, the EU(15) and Canada recorded an import increase below the global average over this nine-year period. China's imports expanded at an annual rate of nearly 30 per cent and became the third largest importer of the world behind the EU(15) and the United States.

Among the leading ITA product traders are seven East Asian developing economies which as a group slightly increased their share in world imports between 1996 and 2005. However, excluding Hong Kong, China and Singapore which both largely import for re-export, the share of the remaining five economies – Chinese Taipei, the Republic of Korea, Malaysia, Thailand and the Philippines – remained roughly unchanged over the 1996-2005 period.

An outstanding development occurred in respect of Indian IT imports. Indian import growth nearly matched that of China over the 1996-2005 period and in contrast to global developments accelerated after 2000. Most of India's IT imports consist of finished IT products such as telecoms and computers. Obviously, the fourfold increase in IT imports between FY2000/01 and FY2005/06, to \$14.1 billion, is associated with the surge in India's software exports after 2000. The Indian example illustrates well that the opportunities created by the availability of IT technology and products are not limited to the IT hardware sector itself but have beneficial repercussions on many sectors of the economy. Important gains in services exports, output and employment could be obtained in India by effectively employing information technology.<sup>10</sup>

The importance of IT products (measured by the share of IT products in merchandise exports) differs widely across countries and regions. In East Asia five developing economies reported a share of IT trade in excess of 30 per cent in 2005 (or double the share in world exports). These economies comprise the Philippines (66 per cent), Singapore (49 per cent), Malaysia (42 per cent), Chinese Taipei (38 per cent) and the Republic of Korea (31 per cent). The importance of IT products in these economies' export basket rose sharply between 1996 and 2000 but decreased markedly thereafter. A similar development could be observed in Japan, where ITA products accounted for shares in total merchandise exports of 26 per cent in 1996, 30 per cent in 2000 and 24.5 per cent in 2005. However, only in Japan was the relative decline strong enough to lower the share of IT products below the level reached in 1996. In contrast to all these Asian economies, the importance of IT products increased steadily in the merchandise exports of China from less than 10 per cent in 1996, to 16.3 per cent in 2000 and to 28.2 per cent in 2005.<sup>11</sup>

Outside Asia the share of IT products in total exports is generally much lower. In the United States the share of ITA products ranged between 21 and 26 per cent in the 1996-2000 period but decreased to less than 20 per cent in 2005. A similar decrease in the share of IT products could also be observed in Mexico and Costa Rica, where the shares stood at 16 per cent and 24 per cent respectively in 2005. In Europe the share of IT products in total merchandise exports remained rather stable at slightly above 10 per cent, while for some of the countries joining the EU in 2004 the share increased sharply (e.g. in Hungary to 22 per cent in 2005).

<sup>10</sup> The number of mobile telephone subscribers in India rose from 0.3 million in 1996 to 90 million in 2005 and internet users are estimated to have risen from 0.4 million in 1996 to 60 million in 2005.

<sup>11</sup> Most likely there is some double counting in China's IT trade which overstates the absolute size and the relative importance of IT products in China's merchandise trade. In 2005, according to Chinese customs statistics about \$33 billion of China's \$200 billion imports of IT products originated from China and these re-imports have expanded faster than total Chinese merchandise imports (and exports) over the last five years.

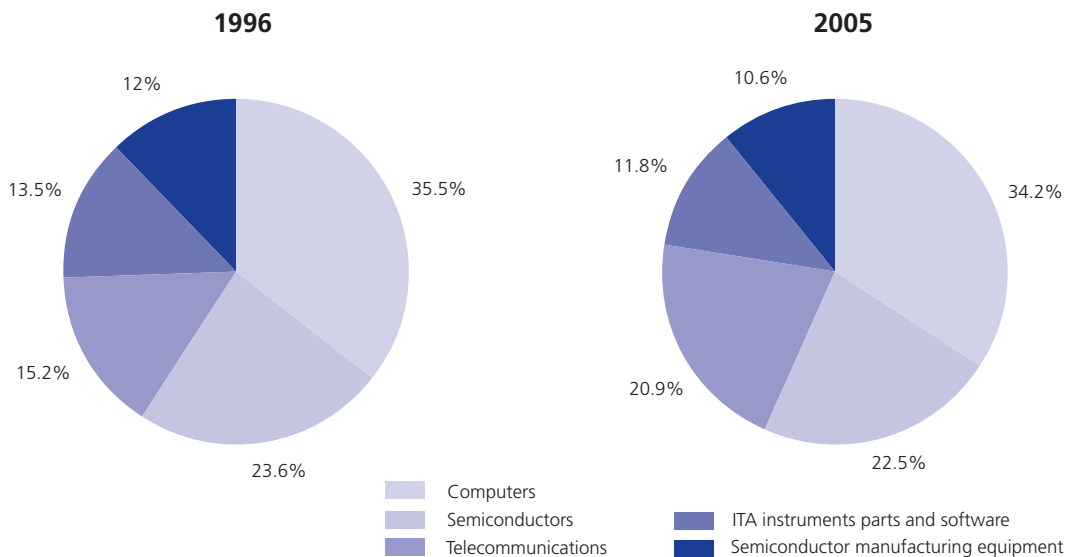


IT trade by ITA product category

Trade developments by major product category are reported in Chart 3 below and in Appendix Table 2. In 2005, the three major categories in world exports of ITA products are computers (34 per cent), semi-conductors (23 per cent) and telecom equipment (21 per cent). Semi-conductor manufacturing equipment accounts for slightly more than 10 per cent, or roughly as much as the three residual groups, ITA instruments, parts and ITA software together.

The share of the computer category in total ITA product trade remained roughly unchanged between 1996 and 2005, while that of semi-conductors decreased markedly and that of the telecom category increased significantly. In respect to semi-conductors one notices that their export shipments had risen much faster than other ITA products in 1990-2000 but thereafter expanded less rapidly than other ITA product categories. Telecommunication products increased their share in total ITA product trade before and after the recession in 2000/01 and approached the share of semi-conductors.

**Chart 3**  
**World exports of ITA products by category, 1996 and 2005**  
 (Percentage shares)



Source: UN, Comtrade database and WTO.

**(d) Conclusion**

The Information Technology Agreement has facilitated the expansion of world trade in IT products by eliminating tariff duties on imports, both among all participants and with the rest of the world. The average applied MFN tariff reduction for the IT products was between two and three percentage points for the developed countries. This cut of two to three percentage points was implemented within three years and at first sight might not look very impressive if compared with the annual variations in exchange rates and the steady fall in prices for most IT products. However, this view neglects to take into account that tariffs on individual tariff lines had sometimes been three times larger than the average rate in developed countries. Moreover, average applied rates in many developing countries were quite significant before the ITA (e.g. India and the Republic of Korea). Even low duty levels can be more than a “nuisance tariff,” and far from being negligible if the product is a component in a global production process that has to cross customs borders several times before reaching the final consumer as a part of a finished product. In addition, the predictability and stability achieved through the binding of IT tariffs has assured investors that tariff costs will not hamper its future import requirements or access to foreign markets.



The number of countries joining the ITA continues to increase and in early 2007 Viet Nam and the United Arab Emirates became new participants. While the country coverage of the ITA is still increasing, its product coverage is at risk of decreasing if no action is taken by the participants. Given rapid technological change in the industry, many new products emerge and old products converge into multi-functional products not clearly covered by the definitions of the ITA established a decade ago. It is therefore important that ITA participants co-operate in a constructive manner in the IT Committee of the WTO to solve these classification problems. A successful conclusion of market access negotiations in the Doha Round would facilitate the work in the IT Committee, as this would tend to reduce the difference between IT tariffs and those of other manufactured goods on the verge of being covered by the ITA.

Appendix Table 1  
The thirty leading exporters and importers of IT products in 2005

	Value (Mill\$)	Share	Average Annual Growth		
	2005	2005	1996-05	1996-00	2000-05
<b>Exporters</b>					
EU(15)	400328	27.7	7	9	5
Extra-EU15 exports	185682	12.9	8	9	7
Intra-EU15 exports	214646	14.9	6	9	3
China	213637	14.8	35	29	40
United States	170121	11.8	3	11	-3
Japan	144759	10.0	4	8	0
Hong Kong, China	115768	...	16	13	18
Re-exports	111124	...	18	16	19
Domestic Exports	4644	0.3	-2	-5	0
Singapore	111969	7.8	7	6	7
Korea, Republic of	87947	6.1	13	18	10
Taipei, Chinese	71891	5.0	17	40	2
Malaysia	59370	4.1	9	15	4
Mexico <sup>a</sup>	33904	2.3	10	25	-1
Philippines	26940	1.9	12	28	0
Thailand	24464	1.7	8	9	6
Canada	19045	1.3	2	13	-6
Hungary	14011	1.0	41	82	16
Switzerland	10956	0.8	4	4	4
Czech Rep.	9919	0.7	25	18	30
Indonesia	6193	0.4	14	29	3
Brazil <sup>a</sup>	4073	0.3	22	32	14
Israel	3758	0.3	1	22	-14
Poland	3169	0.2	22	13	29
Australia	2544	0.2	-1	-2	0
Norway	2486	0.2	6	3	8
Slovakia	2076	0.1	34	31	36
India	2112	0.1	12	8	15
Costa Rica	1744	0.1	70	240	-2
Estonia	1530	0.1	30	63	8
Malta	1208	0.1	3	14	-5
Morocco	1065	0.1	34	75	8
Romania	1046	0.1	37	80	11
Tunisia <sup>a</sup>	972	0.1	13	-56	141
World <sup>b</sup>	1443963	100.0	8	12	6
Memorandum items:					
EU(25)	433842	30.0	7	10	6
Extra-EU25 exports	167596	11.6	8	8	7
Intra-EU25 exports	266245	18.4	7	10	5

a Non-participant of ITA.

b Excluding Hong Kong,China re-exports and including EU(15) intra-trade.

**Appendix Table 1**  
**The thirty leading exporters and importers of IT products in 2005 (cont'd)**

Importers	Value (Mill\$)	Share	Average Annual Growth		
	2005	2005	1996-05	1996-00	2000-05
United States	237429	14.9	5	12	0
EU(15)	419779	27.9	7	10	4
Extra-EU15 imports	205133	13.6	8	11	6
China	199006	12.5	29	27	30
Hong Kong, China					
Retained imports	9223	0.6	-3	4	-8
Singapore	84914	5.3	6	6	6
Japan	79797	5.0	6	10	2
Taipei, Chinese	60965	3.8	20	44	4
Korea, Republic of	59217	3.7	9	12	6
Malaysia	48992	3.1	7	10	5
Mexico <sup>a</sup>	47923	3.0	13	24	5
Canada	32213	2.0	3	11	-3
Thailand	24799	1.6	6	3	9
Philippines	21970	1.4	9	6	10
Australia	15142	1.0	5	5	5
Hungary	14593	0.9	28	47	14
India	14097	0.9	27	22	31
Switzerland	12224	0.8	4	7	2
Brazil <sup>a</sup>	10995	0.7	6	11	2
Czech Rep.	10895	0.7	15	9	19
Poland	10060	0.6	13	13	14
Turkey	8999	0.6	15	23	8
Russian Federation <sup>a</sup>	8268	0.5	15	-7	36
South Africa <sup>a</sup>	6906	0.4	7	-1	13
Norway	5973	0.4	6	3	8
Israel	6022	0.4	4	13	-3
Saudi Arabia	4311	0.3	14	1	26
Romania	3925	0.2	21	23	19
Argentina <sup>a</sup>	3644	0.2	3	9	-1
Slovakia	3518	0.2	24	19	28
Colombia <sup>a</sup>	2822	0.2	6	-6	18
World <sup>b</sup>	1503582	100.0	9	12	6
Memorandum items:					
EU(25)	465399	31.0	8	11	5
Extra-EU25 imports	199154	13.2	8	11	5

a Non-participant of ITA.

b Excluding Hong Kong,China re-exports and including EU(15) intra-trade.

Source: UN Comtrade and WTO.

**Appendix Table 2**  
**World exports of IT products by category, 1996-2005**

(Billion dollars and percentage)

	Value							Average Annual Growth		
	1996	2000	2001	2002	2003	2004	2005	1996-05	1996-00	2000-05
<i>IT products</i>	697	1106	955	951	1083	1328	1444	8	12	5
I. Computers	247	375	342	340	387	460	494	8	11	6
II. ITA Instruments and Apparatus	21	26	27	25	28	34	37	6	5	8
III. Parts and Accessories	50	82	64	64	72	87	92	7	13	2
IV. ITA Software	24	26	26	26	31	36	41	6	2	9
V. Semiconductors	164	280	212	224	258	308	325	8	14	3
VI. Semiconductor Manufacturing Equipment	84	118	98	94	112	149	153	7	9	5
VII. Telecommunications	106	200	186	178	195	255	302	12	17	9

Note: Excluding Hong Kong, China re-exports and including EU intra-trade. Definition of IT products according to the ITA.

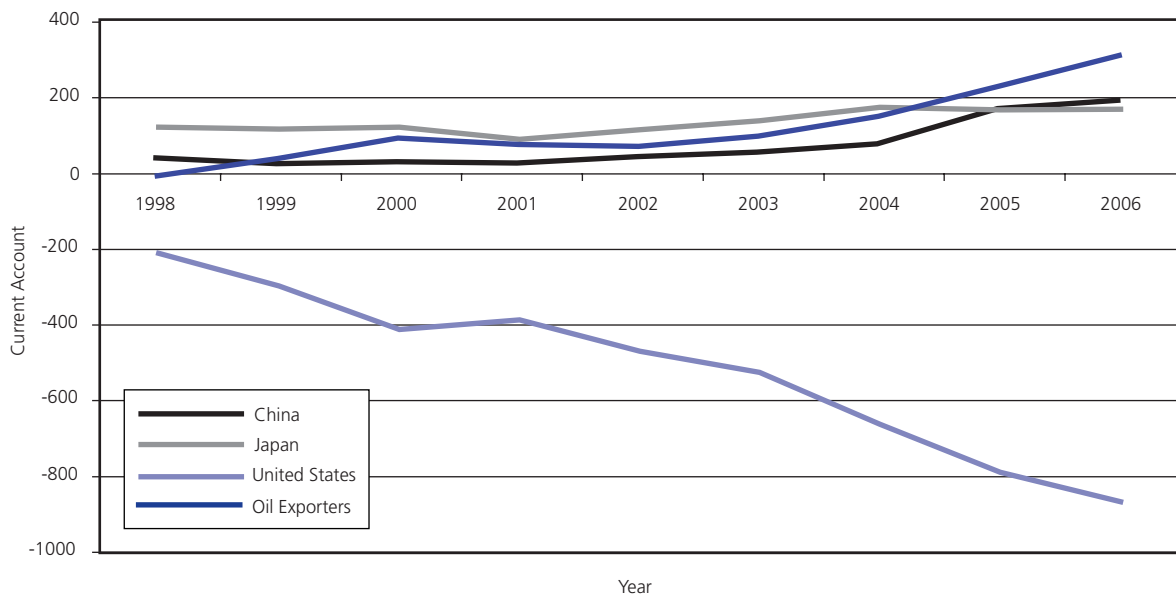
Source: UN Comtrade database and WTO.

## 2. GLOBAL IMBALANCES AND WORLD TRADE

### (a) Introduction

A great deal of attention and concern has been focused on rising global imbalances. These current account imbalances have been most pronounced between the East Asian economies and oil exporters on the one hand and the United States on the other. Some idea of the increase in global imbalances and the pattern they have taken can be discerned in Chart 4, which traces the current account balances of four major economies: the United States, Japan, China, and three major oil exporters (Saudi Arabia, Russia and Norway). The US current account deficit rose to \$870 billion (6.6 per cent of GDP) in 2006 from \$214 billion (2.4 per cent of GDP) in 1998. By way of contrast, China's current account surplus in 2006 is estimated at \$184.2 billion (7.2 per cent of GDP), having risen from about \$32 billion (3.3 per cent of GDP) in 1998. And among the oil exporters, Saudi Arabia's current account surplus reached \$120 billion (32.9 per cent of GDP) in 2006.

**Chart 4**  
**Current account balances of selected economies, 1998-2006**  
(Billion dollars)

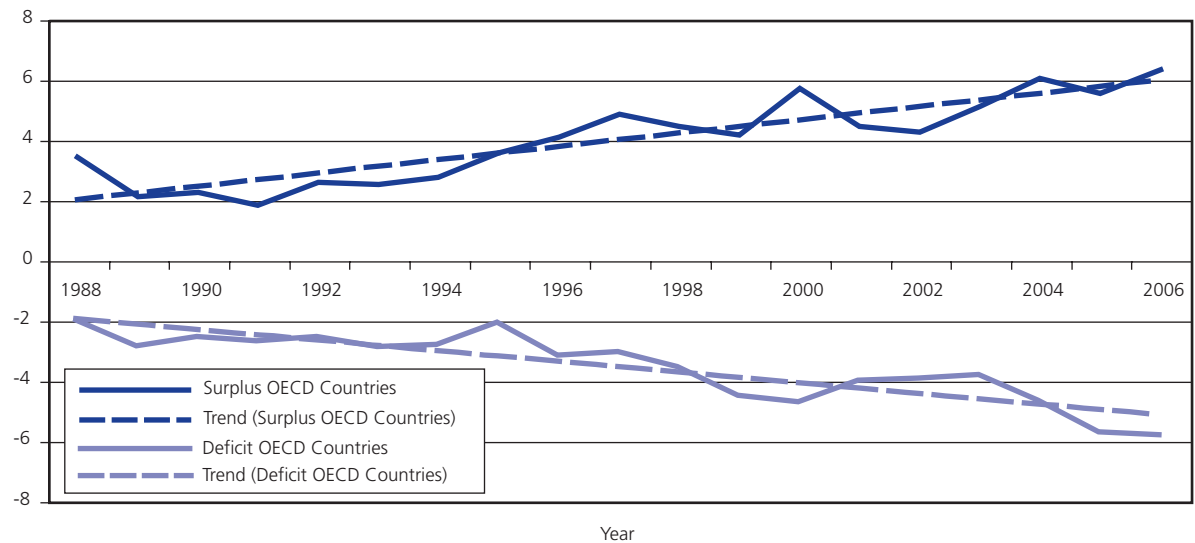


Source: IMF, World Economic Outlook Database, September 2006.

However, the widening of current account imbalances appears to be a much wider and longer-term phenomenon. Among the OECD countries, there is a discernible trend towards larger imbalances. Chart 5 shows the average size of the current account surpluses/deficits as a share of GDP for OECD countries since 1988. For each year, OECD countries are classified according to the state of their current accounts. Surplus (deficit) countries are grouped together and the average surplus (deficit) as a share of GDP is calculated. The dashed lines show the widening trend around which the average surpluses and deficits have grown. In 1988, for OECD countries running deficits, the average size was around 2 per cent of GDP. By 2006, estimates place this average at around 5.8 per cent of GDP. Similarly, in 1988 for OECD countries with surpluses, the average surplus was around 3.4 per cent of GDP. By 2006, this had risen to 6.3 per cent of GDP. So by 2006, the current account imbalances, whether surplus or deficit, of OECD countries were about twice as large as in 1988.

**Chart 5**  
**Average current account surpluses/deficits of OECD countries, 1988-2006**

(Percent of GDP)



Source: OECD Economic Outlook 79 Database.

The trend towards large imbalances is not confined to the OECD countries. Many emerging economies now show larger surpluses in their current accounts, although it may be necessary to distinguish between those who are enjoying a temporary surplus due to a favourable movement in the prices of their exports (as in the recent run-up in commodity prices) and those whose surpluses are the result of the pursuit of a particular development strategy (see the discussion in the next section).

### (b) Explaining the imbalances

In part, larger current account imbalances reflect the impact of greater capital and financial market integration. A current account deficit reflects dissaving by domestic residents, an excess of absorption over income. The fact that it is occurring reflects a willingness by foreigners to finance that excess absorption by accumulating future claims on the earnings of domestic residents. It is important to emphasize that sustained imbalances are primarily a macroeconomic phenomenon and they have little to do with trade policy. Trade measures that restrict imports hurt exports as much (a proposition known as the Lerner symmetry theorem).<sup>12</sup>

One implication of bigger deficits and surpluses is that capital markets are capable of affecting ever larger transfers of savings across national boundaries. Greater integration of capital markets makes it easier to accommodate big differences in savings propensities and profitable investment opportunities among countries. Feldstein and Horioka (1980) developed a well-known test of international capital market integration. Although their original estimate of capital market integration in the OECD countries proved somewhat of a disappointment, more recent estimates appear to offer greater support for the idea of capital market integration. A discussion of the evidence for this appears in Box 1.

<sup>12</sup> See Lerner (1936).

### Box 1: Defining openness in capital markets – revisiting the Feldstein-Horioka test

Over the last few decades, the world has experienced progressive financial market deregulation and global market integration. This is often cited as one of the major factors contributing to the growing size of current account surpluses and deficits relative to GDP among countries.

In a completely closed economy, the total amount of resources available for capital formation is generated internally from domestic savers – whether by households, the corporate sector or government. Since the current account is also the difference between domestic savings and domestic investment, it is always in balance in autarky.

Global financial market integration, however, erodes this home bias, that is, the inclination of investors to invest incremental savings domestically. Any country which opens its capital market, is then able to draw on foreign savings to finance investment, thereby allowing larger current account imbalances to be financed than would have previously been possible.

Feldstein and Horioka (1980) famously tested for this effect of capital market integration by assessing the correlation between domestic savings and investment rates with the following cross-sectional regression:

$$(1) \quad (I/Y)_i = \alpha + \beta(S/Y)_i + u_i$$

where  $(S/Y)_i$  = average Net Saving/Gross Domestic Product of country  $i$ ,  
 $(I/Y)_i$  = average Gross Fixed Capital Formation/Gross Domestic Product of country  $i$ ,  
 $u_i$  = is a random disturbance term,

and  $\alpha$  and  $\beta$  are the relevant parameters to be estimated.

The basis for their reasoning is that in a world of perfect capital mobility, there would be no correlation between domestic saving and investment rates ( $\beta=0$ ) as domestic savings would flow to countries offering the highest returns, while domestic investment would be financed from global capital markets. This is compared to a situation of autarky whereby all incremental savings are invested domestically ( $\beta=1$ ).

Feldstein and Horioka ran the regression on a sample of 16 OECD countries over the period 1960-74 and found that, contrary to expectations of greater capital market openness within the OECD and the evidence of large capital flows among countries, the estimated correlation between savings and investment equalled 0.89 and was not significantly differently from unity. They interpreted this high correlation as implying segmented capital markets or low international capital mobility.

This surprising result led Obstfeld and Rogoff (2001) to identify the Feldstein and Horioka result as one of the six major puzzles of international macroeconomics. Their own re-estimation of the regression for the period 1982-91 on a sample of 22 OECD countries resulted in a correlation coefficient of 0.62. Thus, they concluded that the high correlation between savings and investment had not weakened over time. Furthermore, they add a number of non-OECD countries (for a total of 56) to the regression sample and find that this unexpectedly lowers  $\beta$  to 0.41.

The literature investigating the Feldstein-Horioka puzzle has been extensive, with various extensions of the original test and greater refinement in the econometric methods. More recently, Blanchard and Giavazzi (2002) re-estimated the original Feldstein-Horioka regression for OECD countries. They also looked specifically at the single European market, which has been subject to considerable product and financial market integration and to the countries of the European Monetary Union which adopted



the euro in 1999. Although they conclude that there is no evidence of a decline in the correlation between savings and investment in the OECD countries, their estimate of the coefficient  $\beta$  is lower than that found by Feldstein and Horioka and Obstfeld and Rogoff. Importantly, they find that in the case of the EU and the Euro Area, the Feldstein-Horioka puzzle seems to have largely disappeared. The estimate of  $\beta$  is very low, a finding consistent with the conclusion that incremental savings are increasingly being used to finance investment in other countries.

#### Testing for Global Financial Integration - Results of Feldstein-Horioka test

Studies	Countries	Period	Estimate of $\beta$
Feldstein and Horioka	OECD <sup>a</sup>	1960-1974	0.89*
Obstfeld and Rogoff	OECD <sup>b</sup>	1982-1991 1990-1997	0.62* 0.60*
Blanchard and Giavazzi	OECD	1991-2001	0.57
	European Union		0.36
	Euro Area		0.14

Notes:

\* Significant at the 1 per cent level. Blanchard and Giavazzi do not provide information on the level of significance.

<sup>a</sup> : Australia, Austria, Belgium, Canada, Denmark, Finland, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Sweden, United Kingdom and the United States.

<sup>b</sup> : Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom and the United States.

In line with this idea of greater capital market integration, one leading explanation for rising global imbalances traces it to an excess of savings in emerging markets (specifically East Asia) and the attractiveness of the United States as an investment destination, the depth and sophistication of US financial markets and the role of the dollar as leading international reserve currency (Bernanke, 2005).

The savings glut in emerging East Asia is traced to the lessons drawn by governments there from the financial crisis of 1997-98, the type of development strategy pursued in the region and the underdeveloped nature of the region's financial and capital markets. The Asian financial crisis led the emerging market economies to self-insure against future financial crises. They have done so by accumulating foreign exchange reserves, primarily in US dollars. A number of indicators that have traditionally been used to assess whether foreign reserves are sufficient seem inadequate to explain the build-up of reserves. One such rule is to maintain reserves enough for three to four months worth of imports. A second rule-of-thumb suggests keeping enough reserves equal to a country's short-term external debt (short-term is usually defined as having a maturity of up to one year). A third rule-of-thumb is to keep the ratio of foreign exchange reserves to broad money, which reflects the potential for resident-based capital flight from the domestic currency, significantly above zero. By these traditional indicators of reserve adequacy, the stock of international reserves held by central banks in Asian countries is substantially in excess of what is needed.

Emerging East Asia has followed an export-led development strategy which was supported by exchange rate policies that anchored domestic currencies to the US dollar. It has been a successful development strategy resulting in the rapid mobilization and employment of tens of millions of workers. The means to bring this about is the cross-border transfer of goods and services to the centre country in exchange for financing its deficits (Dooley et al., 2006).

The flow of savings to developed countries has also been encouraged by the lack of financial and capital market development in emerging Asian economies. The underdeveloped nature of the domestic financial or capital markets has become a bottleneck preventing the effective channelling of domestic savings into worthwhile investment projects at home.

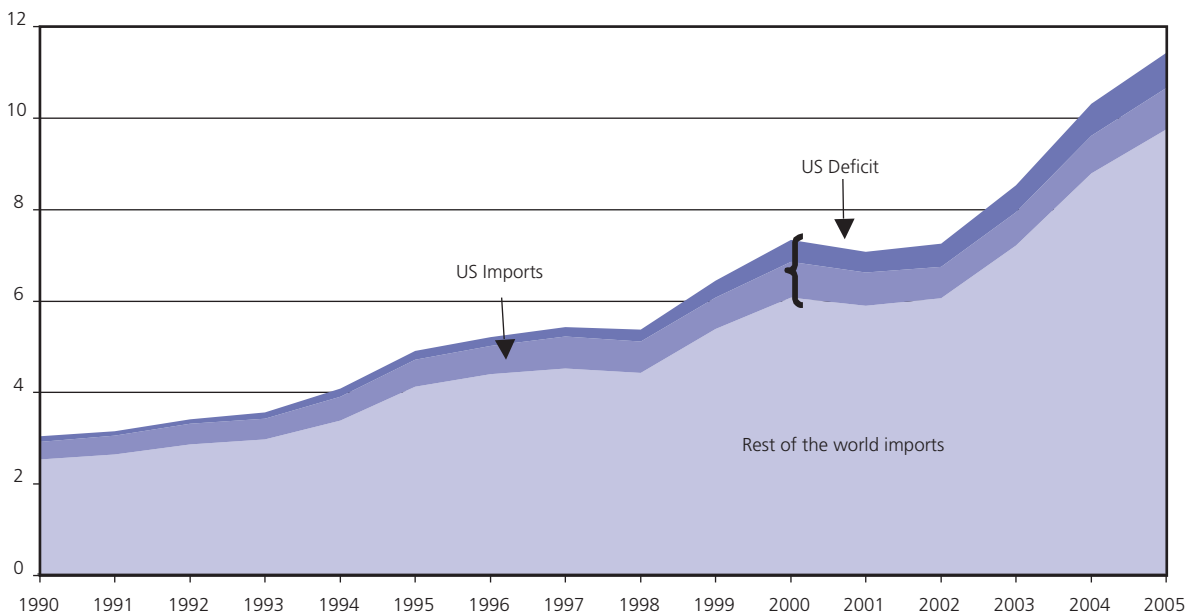
But the size of the imbalances has raised the key question of their sustainability and the nature of the adjustment process. The weight of expert opinion suggests that these imbalances will ultimately decline although there is no consensus on when or on the manner, whether smoothly or abruptly, in which it would occur (Clarida, 2006). But there seems to be broad agreement that some combination of exchange rate and asset price changes would play a role during the process of adjustment. Studies of past adjustments in industrial countries point to the challenges ahead. Larger deficits take longer to adjust and are associated with significantly slower income growth during the current account recovery (Freund and Warnock, 2006). Consumption-driven current account deficits involve significantly larger depreciations than deficits financing investment. Obstfeld and Rogoff (2006) suggest that a large depreciation of the US dollar, something in the order of 30 per cent, could accompany the process.

### (c) Implications for world trade

One side effect of the large current account imbalances of the last few years has been a higher growth rate in world merchandise trade. Many countries were willing to produce and ship more merchandise goods to the United States than could be paid for by the sale (export) of US products to them, thus helping fuel the global economy. Since the year 2000, the US trade deficit has averaged between 7 and 8 per cent of world trade. This is nearly double its average size of 3.8 per cent during the 1990s. The US trade deficit has thus represented a hefty source of demand growth to the world economy. Given that the US has run large trade deficits with nearly all of its major trading partners, that demand has also been spread more evenly than is sometimes thought, although China gets the lion's share (see Table 2).

**Chart 6**  
**US merchandise trade deficit as share of global trade, 1990-2005**

(Trillion dollars)



Source: UN Comtrade database.

But if the US current account imbalance were to narrow as would seem inevitable, would the world be facing the prospect of slower merchandise trade growth? Not necessarily so. It would depend on the nature of the adjustment. If the adjustment occurs through an acceleration of the growth of US merchandise exports, with only some modest adjustment on the import side, then the unwinding of the US deficits need not represent an adverse shock to world trade. And there is some historical evidence to support this “soft-landing” scenario.

**Table 2**  
**US trade deficits with major trading partners, 2006**  
(Billions)

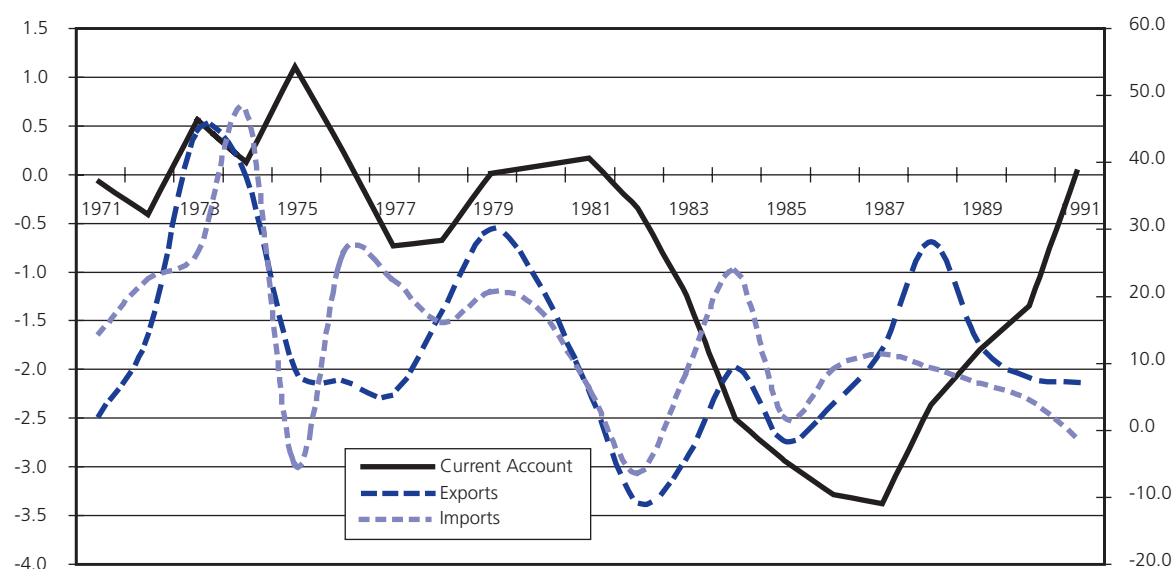
Region/Country	US trade deficit
North America	
Canada	75.6
Mexico	66.5
Europe	
EU (25)	120.0
Eastern Europe	11.2
Asia	
China	232.7
Japan	90.6
India	11.8
Rep. of Korea	14.4
Chinese Taipei	15.6
South and Central America	
Brazil	7.3
Venezuela	28.2
Middle East	35.5
Africa	
South Africa	3.1
<b>TOTAL</b>	<b>836.0</b>

Source: US Bureau of Economic Analysis.

Chart 7 shows the pattern of previous adjustments in the US current account deficit during the two decades after 1970. Three figures are shown: the current account as a share of GDP, the annual growth rate of nominal exports and the annual growth rate of nominal imports. There were small imbalances in the early 1970s, just after the Smithsonian Agreement ended the fixed exchange rate system of Bretton Woods, and in the mid-70s, partly because of the oil price shock. A longer and more pronounced period of imbalances took place in the mid-1980s, as a rebounding US economy was coming off its deepest recession of the post-war era and the dollar appreciated strongly against the major currencies. In all these episodes, exports played an important role in facilitating the adjustment towards current account balance. US nominal exports grew strongly in each episode -above 40 per cent in 1973, and close to 30 per cent in 1979 and in 1988. US import growth slackened during each of those periods, although it did not fall off precipitously until in the last episode of adjustment. Beyond the US example, Freund's

(2000) study of 25 episodes of turnarounds in the current account imbalances of industrialized countries between 1980 and 1997 found that real export growth was generally part of the adjustment process.

**Chart 7**  
**Pattern of previous US current account adjustments, 1970-91**  
(Percentage)



Source: IMF, World Economic Outlook Database, September 2006.

Now, adjustments to large current account imbalances are complex processes. The speed and economic effects depend on many factors. How much of the adjustment takes place in changes in asset valuation? How much in a reduction in absorption? How much in expenditure switching? It will also matter how much international coordination among finance and central bank authorities takes place to ensure a supportive policy environment. Thus, the discussion above should not be seen as simplifying the challenges that are involved. If one can take a specific example, the soft-landing scenario requires that the acceleration of US export growth be matched by increased demand for US goods from the rest of the world. This would need to be triggered by just the right kinds of movements in exchange rates, asset and goods prices. A more liberal trading system would also facilitate this adjustment. Some comfort should be drawn from the fact that smooth adjustments have occurred in the past, but by the same token, history offers no guarantees for the future.

Beyond the implication for future world trade growth, the more immediate threat to trade from global imbalances is the ammunition it has provided for trade protectionism. There is a temptation to explain the source of the imbalance to unfair trade practices rather than to differences in savings and investment behaviour between countries. Thus, proposed solutions typically invoke protectionist measures. But they are addressing the symptoms rather than the causes of the imbalances. This type of policy debate poisons public perception about the desirability of more trade liberalization, such as that being discussed in the Doha round of multilateral trade negotiations. As was emphasized earlier, sustained current account imbalances are primarily a macroeconomic phenomenon. The adjustment, when it comes, needs a supportive international policy environment, and a successful conclusion to the current multilateral trade negotiations would go a long way towards providing just that.

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