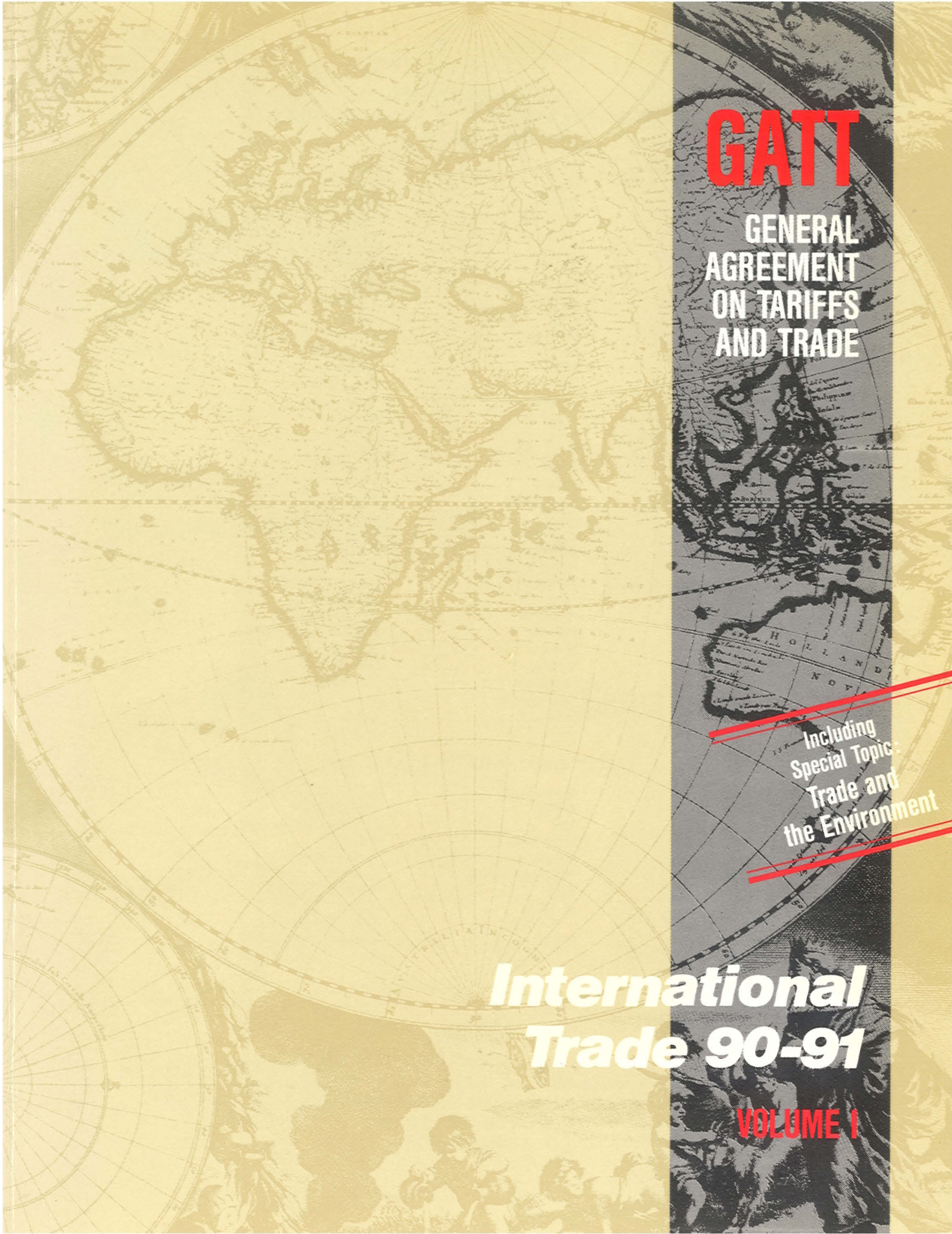


GATT

GENERAL AGREEMENT ON TARIFFS AND TRADE

Including Special Topic: Trade and the Environment

International Trade 90-91

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International Trade 90-91

Volume I

General Agreement on Tariffs and Trade

Geneva 1992

The GATT Secretariat's annual report *International Trade* appears in two volumes. Volume I is devoted primarily to an analysis of developments in world trade and international commercial relations. Volume II provides statistical tables and charts. The two-volume set is available in English, French, and Spanish language editions, and may be ordered from the GATT Secretariat or through booksellers at a price of 30 Swiss francs per volume.

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ABBREVIATIONS AND SYMBOLS

ASEAN	Association of South-East Asian Nations
CMEA	Council of Mutual Economic Assistance
ECE	Economic Commission for Europe
ECLAC	Economic Commission for Latin America and the Caribbean
EC	European Communities
ECU	European currency unit
EFTA	European Free Trade Association
FAO	Food and Agriculture Organisation of the United Nations
GDP	Gross Domestic Product
GNP	Gross National Product
IBRD	International Bank for Reconstruction and Development (World Bank)
IEA	International Energy Agency
IMF	International Monetary Fund
ISIC	International Standard Industrial Classification
LAIA	Latin American Integration Association
MERCOSUR	Common Market among Argentina, Brazil, Paraguay and Uruguay
OECD	Organisation for Economic Co-operation and Development
OPEC	Organisation of Petroleum Exporting Countries
SITC	Standard International Trade Classification
UNCTAD	United Nations Conference on Trade and Development
UNSO	United Nations Statistical Office

c.i.f.	cost, insurance and freight
f.o.b.	free on board
n.e.s	not elsewhere specified
n.i.e.	not included elsewhere

The following symbols are used in this publication:

... not available
0 figure is zero or became zero due to rounding
– not applicable
$ United States dollars

Billion means one thousand million.

Minor discrepancies between constituent figures and totals are due to rounding.

All value figures are expressed in United States dollars. Unless otherwise stated (i) all import data are c.i.f. and all export data are f.o.b., and (ii) all trade figures are on a customs basis and include the intra-trade of free trade areas, customs unions, regional and other country groupings. Data for the latest year are provisional.

Closing date for statistics
30 November 1991

I. OVERVIEW AND OUTLOOK FOR THE WORLD ECONOMY

Recent economic developments and short-term outlook

World trade and output growth in volume terms slowed in 1990 and again in 1991.[1] Bright spots in the 1990 trade performance included the strength of Germany's import demand, boosted by unification, and the continued above average trade growth of several developing economies in Asia. Import demand was weak in North America, and fell in Central and Eastern Europe and the USSR. A similar picture emerges from available figures for 1991, but in addition, import demand weakened further in Western Europe – in spite of the booming import demand of Germany – and in Japan. While there are signs of continued strength in developing economies in Asia, the trade performances of Central and Eastern European countries and the USSR have again deteriorated sharply in 1991.

Boosted in part by the «valuation effect» of the depreciation of the dollar relative to major West European currencies, the value of world merchandise trade rose 13 per cent in 1990 to $3.5 trillion, and trade in commercial services was up 17 per cent to $810 billion. Growth in the value of world trade in merchandise and commercial services was much lower in 1991 due to the appreciation of the dollar and weaker merchandise trade volume growth.[2] In 1990 the depreciation of the dollar also played a key role in Western Europe's above average trade performance, and in Germany overtaking the United States to become the world's leading merchandise exporter. In 1991, the United States regained the top spot from Germany in the export rankings as a result of the recovery of the dollar and more rapid export volume growth.

Among the more dramatic trade developments in 1990 was the plunge in intra-regional trade in Central and Eastern Europe and the USSR, which continued in 1991. The contraction of national output in most countries spilled over into import demand at the same time as traditional trade ties within the now-disbanded Council for Mutual Economic Assistance (CMEA) were being de-emphasized. With the recession in Central and Eastern Europe continuing and an economic and political crisis in the USSR, the decline of intra-regional trade was even more pronounced in 1991 than in 1990. However, exports to Western Europe continued to expand strongly: figures for the first half of 1991 show a faster rate of growth than in 1990, partly due to the increase of petroleum prices.

The current account imbalances of major traders – the United States, Germany, Japan and the United Kingdom – narrowed again in 1990. The United States current account deficit continued to decline in 1991 due to Gulf crisis-related transfers from Japan and Germany, strong export growth and the impact of the recession on import growth. With merchandise imports up strongly, Germany's current account moved into deficit in 1991 for the first time since 1981. In contrast, the dollar value of Japan's current account surplus in 1991 was double the 1990 figure. However, as a share of GNP, Japan's current account surplus was less than half the 4.3 per cent recorded in 1986.

An important factor behind trade and economic developments in 1990 and 1991 was, of course, the Gulf crisis. Because 1990 was more than half over when the crisis began, and signs of an economic slowdown in North America were already present, the overall impact of the crisis on the course of world trade and global economic activity in 1990 was not great. Effects were more pronounced at the level of individual countries in certain regions. Sharply higher export earnings for fuel exporters followed the temporary rise in oil prices in the second half of the year. But with oil prices now back at the early 1990 level and demand for fuels weak, the exports of fuel exporters declined in 1991. For a number of the least developed countries, higher oil prices added to the economic costs of the Gulf crisis, which included reduced worker remittances and interrupted merchandise and commercial service exports. Since March 1991, trade ties have been partially restored, and a portion of the repatriated workers have returned to the Gulf region, renewing to a certain extent the flow of remittances.

In the early months of 1991, the outbreak of hostilities in the Gulf made consumer and business confidence in the

[1] See Part II below for a detailed discussion of trade developments in 1990.

[2] In 1991, the dollar appreciated by 2 ½ per cent against the ECU, compared with a 13 ½ per cent depreciation in 1990.

future more fragile in the major industrial countries, further weakening production and trade activity. After the hostilities ceased in early March, consumer and business confidence bounced back and a rapid rebound in world economic activity was widely predicted, stimulated by recovery from recession in the United States in the second half of the year. For reasons that are not yet clear, the pick up in economic growth in the United States was weaker than predicted. Meanwhile, growth has been slowing in Europe and Germany – a trend which is expected to continue in 1992. However, the United States economy is still forecast to lead the way to a modest recovery of world trade and output growth in 1992.[3]

Medium-term outlook for the world economy

The decade ahead promises to be one of the most challenging and exciting periods in the past forty years. Market-oriented reforms are underway in many low income countries, including those in Central and Eastern Europe and the USSR. From Western Europe and North America a desire for greater regional economic integration has spread to Latin America and Asia. After a decade of declining per capita incomes, attention is being focused more sharply on the economic situations of the least developed countries, especially those in Africa. And more so than at any time in the past, the quality of the natural environment is claiming the attention of the public and policy makers.

These developments are taking place in a world economy in which economic growth has been slowing for three consecutive years and, based on current econometric forecasts, will recover only moderately in the medium-term. For example, according to the International Monetary Fund «Real GDP growth in the industrial countries is projected to pick up from its current slow pace and average 2.75 per cent in 1991-96 – close to the average rate of growth during the two most recent business cycles covering the periods 1974-79 and 1980-90, but substantially less than in the earlier postwar period».[4]

In view of the close relation between output growth and trade growth, a stronger world economic recovery would raise trade growth and conversely, a stronger basis for world trade growth would enhance the prospects for world economic recovery. Changes that are vital to the outlook for trade and output growth in the 1990s include continuing economic reforms in a broad cross-section of countries, preventing a return to high inflation rates in the industrial countries, continued liberalization of capital flows, reversing the decline in national savings rates in the major industrial nations, and last but not least, maintaining and strengthening the open multilateral trading system.

The multilateral trading system has gained important new supporters with the opening up to trade of countries in Central and Eastern Europe and the USSR.[5] For much of the postwar period, administrative controls in these countries have stifled international trade based on comparative advantage, even among members of the CMEA, and the emerging market-oriented reforms are certain to raise the importance of trade in these economies in the medium-term. Welcome as it is, the prospect of their expanding trade has raised concerns in some of their trading partners about the degree of structural adjustment which this might entail.

A closer look at the figures, however, suggests that those fears are exaggerated. For example, taken together, the Czech and Slovak Federal Republic, Poland and Hungary have about the same population as the combined total of Hong Kong, the Republic of Korea, Singapore and Taiwan, but their share in world trade prior to the beginning of the reforms was well below the share of the Asian group twenty years ago. The relative ease with which the rest of the world adjusted to a tripling of the Asian group's share of world merchandise trade between 1970 and 1990 suggests that even a sharp expansion of exports from the three East European countries would not create major adjustment problems.[6]

Moreover, given the development needs of the former centrally planned economies, increases in their exports will be matched by increases in their imports, stimulating employment and output in the export industries of their trading partners. Indeed, as their exports begin to expand, import growth is likely to exceed export growth as a net inflow of foreign capital linked to the modernization of firms and the infrastructure provides a strong stimulus to import expansion – as was the case, for example, with Thailand and Malaysia in the second half of the 1980s.

This new outward orientation comes at the end of a decade in which a large number of developing countries have led the way by undertaking autonomous trade liberalization initiatives and other market-oriented reforms.[7] Reinforced by debt reduction and increased access to world markets, the

[3] The IMF's *October 1991 World Economic Outlook* projects a rebound in world economic growth to 2.8 per cent in 1992, from 0.9 per cent in 1991, and 2.2 per cent in 1990.

[4] *May 1991 World Economic Outlook* (p. 42). The major reason for slower growth in potential output of major industrial countries is an apparent secular decline in factor productivity. Protectionism has an adverse impact on trends in factor productivity by reducing the opportunities for international specialization.

[5] See Appendix Table 1 for a distribution of the USSR's trade and output by republic.

[6] This conclusion is reinforced by the small shares of the former centrally planned economies in the trade of their principal trading partners. See the figures in Part II below and in GATT Press Release GATT/1477, dated 14 March 1990.

success of these reforms will not only benefit the countries undertaking them, but will also boost world trade and output growth. While several countries have recently benefited from such support, market access in sectors such as agriculture, textiles and clothing continues to be obstructed by a heavy array of protectionist measures. Together with the pursuit of other items on the agenda of the Uruguay Round, liberalization of these sectors – on a multilateral rather than a piecemeal regional basis – is vital to the economic development of the large number of low income countries.

Trade and environment: an issue for the 1990s

Protecting the natural environment is one of the new challenges facing the world community. To domestic environmental concerns have been added such «global commons» issues as ozone depletion and global warming. Concerned citizens routinely scrutinize the environmental policies of other nations to see whether they improve the planet's natural environment or lead to species depletion, loss of biodiversity, and the disappearance of tropical forests.

Equally, the growing importance of trade, reflected in the ongoing integration of the world economy, has made policymakers increasingly aware of the role that liberal trade and the rules of multilateral trading system play in sustaining the basis for economic growth. The integration of the world economy is not, however, only providing a stimulus to growth. It is also blurring the traditional distinction between «domestic issues» and «international issues» stemming from participation in world markets for goods, services and capital.

Given the concurrent globalization of both economic activity and environmental concerns, the intersection of trade and the environment was inevitable.

Is there a trade-off between liberal trade and environmental quality? How will these two dominant concerns – economic well-being and environmental quality – be integrated to produce sustainable economic growth? Will world production increasingly locate in low standard areas while environment-conscious nations suffer production and employment losses? Do the GATT rules permit governments to implement appropriate environmental policies? Will the environment issue be captured by protectionists? These are some of the questions that arise when trade and environment, two of the most important issues of our time, are considered together. Part III of this report is an initial look at the interaction of these two issues and its implications for the GATT.

[7] See the report by GATT's Director General, *International Trade and the Trading System* (May 1991), for a list of 47 countries that have undertaken autonomous trade liberalization actions since the start of the Uruguay Round.

II. WORLD TRADE IN 1990

Value growth accelerates ... volume continues to slow

Trends in the volume and value of world trade diverged sharply in 1990.[8] The *volume* growth of world merchandise trade slowed in 1990, reflecting a less dynamic world economy. Exchange rate developments and higher oil prices, in contrast, helped the dollar *value* of world merchandise trade to expand at a much faster rate than in 1989.

Boosted in part by the «valuation effect» of the dollar's depreciation against the major European currencies, the value of world merchandise trade increased 13 per cent in 1990 to $3½ trillion (Table 1).[9] An increase of 17 per cent brought world trade in commercial services – which includes transportation, tourism, telecommunications, insurance, banking and other professional services – to $810 billion. The corresponding growth rates for the value of merchandise and commercial services trade in 1989 were 8 and 10 per cent, respectively.

Estimates of the growth in the volume of world merchandise trade point not to an acceleration, but to a slowdown, from 7 per cent in 1989 to 5 per cent in 1990 (Chart 1). The growth rate for world output also slipped, from 3½ to 2½ per cent.[10] Despite the slowdown, however, trade growth continued to exceed output growth by a sizeable margin. This trend – for an increasing share of the world's output to enter international trade – is tangible evidence of the ongoing integration of the world economy.

While the growth rates for trade and output were close to the annual averages for the eight-year expansion which began in 1983, they also marked the second consecutive year of slower growth in the world economy. Moreover, there was a further slowdown in economic growth in 1991.

Despite slowdown, manufactures trade still the most dynamic

Sluggish growth in exports of both manufactures and mining products contributed to the slower growth in the volume of world merchandise trade in 1990 (Table 2). Agricultural exports bucked the trend, expanding slightly faster than the year before.

Table 1
Value of world exports, 1989 and 1990

(Billion dollars and percentage)

	Value		Annual change	
	1989	1990	1989	1990
Agricultural products	410	435	4½	6½
Mining products	420	495	14½	17½
Manufactures	2150	2445	7½	13½
Total merchandise	**3075**	**3485**	**8**	**13**
Transportation	235	270	9½	15½
Travel	200	245	8½	20½
Other private services and income	260	300	12	15½
Total commercial services	**695**	**810**	**10**	**17**

Notes: 1. The statistics for commercial services are taken from balance-of-payments statistics, while the statistics for merchandise trade are taken from customs data. These two sets of data are not directly comparable because (i) the country coverage of available data on commercial services trade is less comprehensive than for merchandise trade, and (ii) the data on commercial services trade are subject to other sources of (primarily downward) bias. See Section III of Volume I of *International Trade 1988-89* for additional details on these and other aspects of international trade in commercial services.

2. While figures for product groups are rounded to the nearest $5 billion, growth rates are computed on the basis of recorded figures. For merchandise trade, figures for product groups do not add up to the total due to exports of products n.e.s.

3. World imports of shipment services exceed world exports by a substantial margin due to under-reporting and non-reporting of world exports of shipment services. The difference between the two figures (approximately $33 billion in 1990) has been added to the figure for exports of transportation services.

[8] Part II of this Report is an updated and extended version of the GATT Secretariat's first assessment of world trade developments in 1990, (GATT Press Release, GATT/1504, 19 March 1991).

[9] A depreciation of the United States dollar against the currencies of the other major trading nations automatically increases the dollar value of world trade. In 1990, the average value of the dollar's (trade weighted) nominal exchange rate fell 7 per cent, in contrast to an increase of 5 per cent in 1989. The dollar/yen exchange rate was largely unchanged for the year as a whole, while the dollar was down 13½ per cent against the ECU.

[10] Lack of data, as well as methodological problems, make it impossible to estimate trends in the volume of world trade in commercial services. In order to improve the comparability of the trade and output figures, the output figures in Chart 1 refer only to the production of goods – that is, they exclude the production of services.

Chart 1
Volume of world merchandise trade and output, 1980-90
(Average annual percentage change)

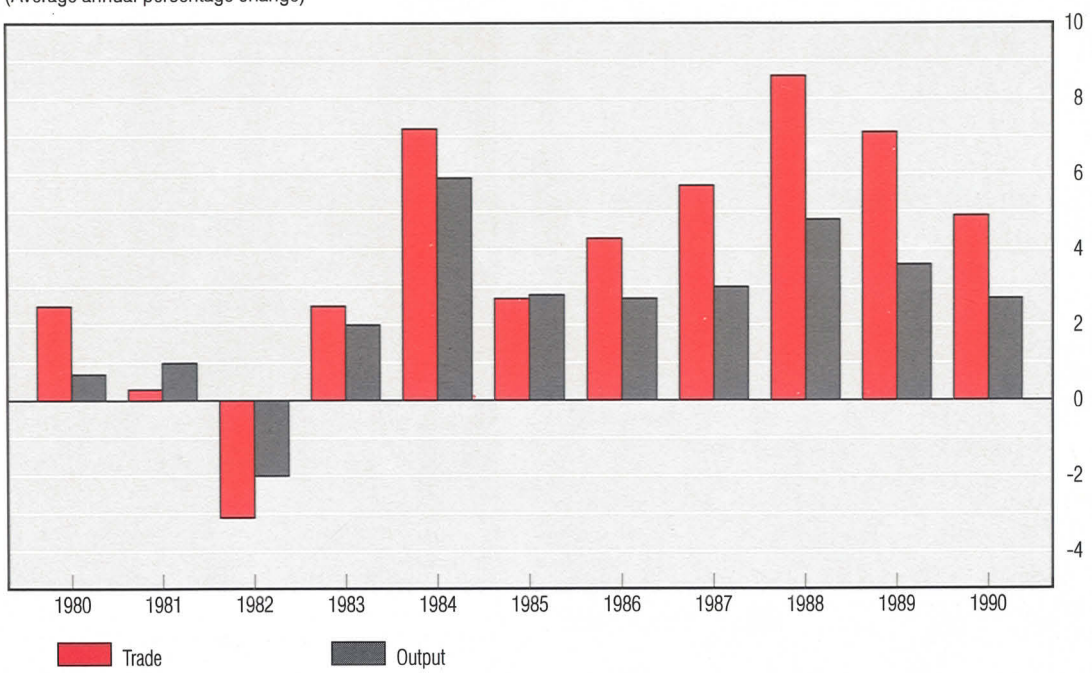


Table 2
Growth in the volume of world merchandise exports and output by major product group, 1983-90

(Average annual percentage change)

	1983-90	1989	1990
World exports	**6**	**7**	**5**
Agricultural products	2	3	3 ½
Mining products	4	4 ½	2 ½
Manufactures	7 ½	8	5 ½
World output	**4**	**3 ½**	**2 ½**
Agricultural products	2	3 ½	2 ½
Mining products	2 ½	2	1 ½
Manufactures	5	5	3

While growing more slowly, trade in manufactures continued to record the highest volume growth among the major product groups in 1990, as it has nearly every year since the current expansion began in 1983 (the exception was 1986, when exports of mining products recovered sharply). The slight increase in the growth in the volume of trade in agricultural products in 1990 – which benefited, among others, Canada and exporters in Latin America and Western Europe – was largely due to the stronger import demand of the United States and the European Communities. Slowing economic activity in 1990 and declining fuel exports from the USSR depressed the growth of world trade in mining products. The Gulf crisis had only a limited impact on the volume of world oil trade, as lost exports from Kuwait and Iraq in the second half of 1990 were offset (with a lag) by increased shipments from other OPEC members.

Fuels the top gainer in value

Trends in export volumes, as well as the dollar's depreciation and price developments for the major commodities explain much of the trends in the *value* of trade in the major product groups in 1990. The fastest growing category of world trade was mining products (Table 1), with fuels trade up 25 per cent at the same time as trade in ores, minerals and non-ferrous metals declined slightly or stagnated (Table 3). After declining in the first half of 1990, oil prices shot up temporarily in the second half to more than $30 per barrel following the outbreak of hostilities in the Gulf, for an increase of about 25 per cent for the year as a whole. The continued sluggish growth in the value of agricultural exports was due to weakness in the dollar prices of food and raw materials, which partly offset the automatic boost to the value of trade in food from the dollar's depreciation against the ECU (Western Europe's intra-regional trade accounts for about 30 per cent of world food trade).

Among manufactured products, exports of clothing showed the strongest gain in value in 1990 (Table 3). The acceleration of world trade in clothing stemmed largely from the expansion of Western Europe's imports, which were up by more than 30 per cent in 1990, in contrast to the 3 per cent gain in 1989. This strong increase in Western Europe's imports of clothing (spurred by the dollar's depreciation) more than offset the deceleration of North American import growth, from 13 per cent in 1989 to 4 per cent in 1990.[11] The 13½ per cent expansion of world exports of automotive products, despite the stagnation in the number of cars and trucks exported by the principal exporters, suggests that most of the value increase was due to a rise in dollar export prices. In contrast, price trends for electronic products were much weaker, indicating that the slightly below average value growth of office machines and telecom equipment represents an above average growth in export volume.

The sharp deceleration in the growth of iron and steel exports, from an above average expansion (of 9 per cent) in 1989 to stagnation in 1990, contrasts with the general acceleration of export growth observed for all other manufactured products. These diverging developments reflect the cyclical nature of international steel trade and the severity of the recession in the global steel industry (measured in volume terms, world steel output and trade shrank in 1990).

The dollar value of trade in travel and transportation services rose sharply in 1990, in spite of the Gulf crisis. Factors behind the increase include a 6 per cent gain in the total number of passengers carried on scheduled flights, as well as the valuation effect from the dollar's decline. Moreover, the key summer tourist season in North America and Western Europe was almost over when the crisis began. Figures for the first half of 1991, in contrast, indicate a sharp decline in passenger traffic due to the Gulf crisis and the general slowdown in world economic growth.

Trade of regions and countries

The depreciation of the dollar against the major European currencies played a key role in Western Europe's above-average 1990 trade performance in value terms (Table 4). Export and import growth rates were roughly three times those recorded in 1989 (when the dollar appreciated), raising the share of Western Europe in world merchandise trade to an historic peak (Chart 2).[12]

For the Middle East and Africa, higher earnings from oil exports helped keep their merchandise export growth above the world average for the second consecutive year. However, not only are their shares of world merchandise exports and imports still substantially below the 1980 peaks, but even the nominal dollar value of their export earnings remain 40 and 20 per cent below 1980, respectively. This decline is all the more dramatic when considered in relation to the 70 per cent expansion in the value of world merchandise trade between 1980 and 1990.

In contrast to 1989, merchandise export and import growth in Latin America, North America and Asia was below the world average in 1990. In Latin America the gains by fuel exporters were largely offset by the sharp contraction in Brazil's exports caused by the domestic adjustment program. Export growth below the world average in Japan and several of the other leading Asian exporters of manufactures more than offset a sharp expansion in China's exports. Although import growth continued to be strong in Japan and other leading Asian exporters of manufactures, imports into China and Australia contracted sharply, causing Asia's share in

Table 3
Developments in merchandise and commercial service exports by product, 1985-90

(Percentage)

	Average annual change in value		
	1985-90	1989	1990
Expanded faster than world trade in 1990			
Fuels	1	14½	25
Travel	18	8½	20½
Clothing	18	9½	16½
Other consumer goods	18	9	16
Other machinery and transport equipment	15	9	15½
Other private services and income	15	12	15½
Transportation	15½	9½	15½
Other semi-manufactures	16	7½	15
Expanded at about the same rate as world trade in 1990			
Textiles	14½	4½	14½
Automotive products	14	3½	13½
Chemicals	14½	4½	12½
Office machines and telecom equipment	18	8	12
Expanded more slowly than world trade in 1990			
Food	10	5	10
Non-ferrous metals	15	13	1
Iron and steel	9½	9	½
Ores and minerals	8	14	-2½
Raw materials	10	3½	-3½

Note: See Technical Appendix in Volume II for the definitions of product groups.

[11] The valuation effect was more pronounced in textiles because Western Europe has a greater share of world trade in textiles than in clothing (almost one-half compared to one-third).

[12] Measured in ECU, Western Europe's export growth decelerated sharply, from 14½ to 3½ per cent, while in dollars it accelerated from 6½ to 19½ per cent.

Table 4

Value of world merchandise trade by region, 1989 and 1990

(Billion dollars and percentage)

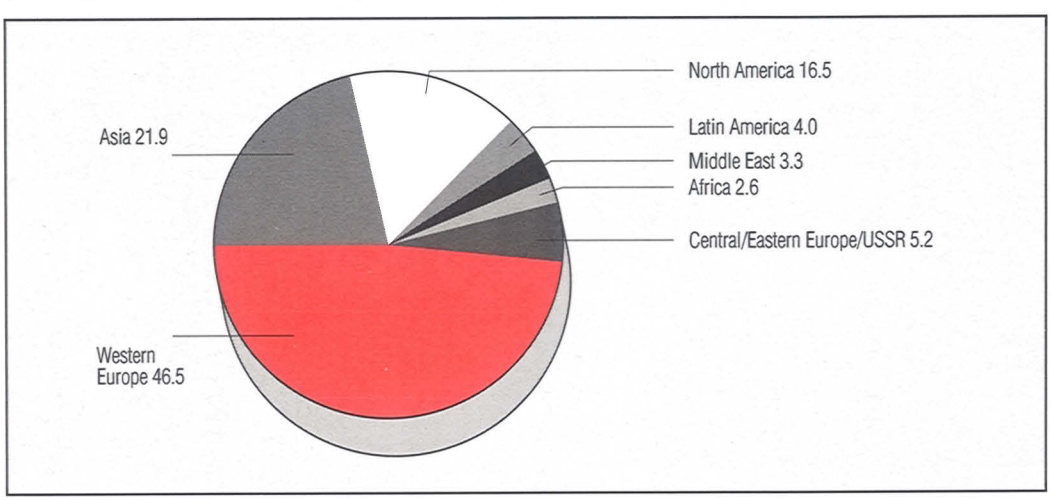
	Exports			Imports		
	Value	Annual change		Value	Annual change	
	1990	1989	1990	1990	1989	1990
World	**3480**	**8**	**13**	**3610**	**8**	**13 ½**
North America	525	10 ½	8 ½	641	7	4 ½
Latin America	148	10 ½	9 ½	132	9	13
Western Europe	1613	6 ½	19 ½	1685	7 ½	21
EC	1359	7	20	1413	8	21
EFTA	225	5 ½	20 ½	229	6	17
Central/Eastern Europe/USSR[a]	182	-2 ½	-7	187	2 ½	-3 ½
USSR[a]	104	-1	-5	121	7	5 ½
Central/Eastern Europe[a]	78	-3 ½	-9 ½	67	-3 ½	-17
Africa	94	9 ½	14	93	½	13 ½
Middle East	132	27 ½	23 ½	103	2	12 ½
Asia	791	8 ½	8 ½	765	14	12
Japan	288	3 ½	5	235	12	12
China	61	8 ½	18	52	5 ½	-10 ½
Other leading traders of manufactures[b]	320	12	9 ½	331	15 ½	16 ½
Developed countries	2500	7	15	2631	8	15
Developing economies	740	14	13	729	11 ½	15 ½
OPEC	190	27	27	120	1	15

[a] Figures affected by difficulties in converting data expressed in national currencies into dollars. See Box 1.
[b] Hong Kong, Republic of Korea, Malaysia, Singapore, Taiwan and Thailand.

Chart 2

Regional shares of world merchandise trade, 1990

(Percentage share based on the value of exports and imports)



world imports to also decline slightly in 1990. In dollar terms, the imports and exports of Central and Eastern Europe and the USSR fell more in 1990 than in 1989, as a major decline in intra-regional trade was only partly offset by an expansion in extra-regional trade.

Volume developments by region

The deceleration in merchandise trade growth in 1990 on a *volume* basis was due to the reduced growth of imports into North America, Japan and Western Europe, and the declining imports of Central and Eastern Europe and the USSR (Table 5). As the North American economy slowed, import demand became sluggish, and in the final quarter of 1990, fell below the previous year's level. The growth of exports from North America also slowed, but remained well above the world average. Western Europe was a mirror image of North America, as import demand was strong throughout the year, buoyed by continuing economic expansion, and export growth weakened. A key factor behind the relative strength of import demand in Western Europe was the strong growth of domestic demand in the newly united Germany, with the export volume growth of the former Federal Republic of Germany falling from 7½ to 1½ per cent, and import volume growth up from 7 to 11½ per cent, between 1989 and 1990. One factor behind the steep decline in Germany's export volume growth was the increased domestic consumption of products that would otherwise have been exported.

Table 5
Volume of world merchandise trade by region, 1989 and 1990

(Annual percentage change)

	Exports		Imports	
	1989	1990	1989	1990
World	**7**	**5**	**7**	**5½**
North America	10	7½	6	2½
Western Europe	7	4	8½	6
EC	7½	4	8½	6
EFTA	7	5½	6½	4
Central/Eastern Europe/USSR	-1	-11	5½	-1½
USSR	0	-13	9½	-2
Asia	6	7½	8½	8
Japan	4	5½	8	6
Other leading traders of manufactures[a]	6½	9	9½	13
Developed countries	8	5½	8	5½
Developing economies	7	6	8	8½
OPEC	12	5	3	6

[a] Hong Kong, Republic of Korea, Malaysia, Singapore, Taiwan and Thailand.

The developing economies as a group posted export and import volume growth above the world average in 1990, largely due to the continuing strength of the Asian traders, six of which now account for more than 40 per cent of the developing economies' trade. Hong Kong, Singapore, Thailand and Malaysia recorded export and import volume growth rates well above the world average. In contrast, export volume growth rates in Taiwan and the Republic of Korea were not only below the world average in 1990, but also well below the rates they attained during the early part of the 1980s.

As the international demand for crude petroleum and related products weakened, the growth in the volume of exports from the OPEC countries fell by more than half, from 12 per cent in 1989 to 5 per cent in 1990. In contrast, OPEC's import volume growth recovered in 1990 to 6 per cent (despite the embargo of Kuwait and Iraq), as imports of the Islamic Republic of Iran, Indonesia and others expanded sharply. Aside from the members of OPEC and the leading Asian exporters of manufactures, preliminary data indicate that the export and import volume growth of other developing economies (as a group) was close to the world average in 1990, but below the corresponding rates for the preceding year. In (non-OPEC) Latin America, export volume growth slowed as Brazil's exports contracted and Mexico's export volume growth decelerated.

Trade between the regions

The ranking of regional export flows in *value* terms in Table 6 (on the basis of growth in 1990) was influenced by the sharp increase in the price of petroleum, the valuation effect of the dollar's depreciation against the European currencies, and the different positions of the regions in the business cycle. For the most part, trade flows involving the oil-exporting regions and Western Europe are in the top half of the table, while those involving North America are in the lower half.

The rise in the price of crude petroleum helped the Middle East maintain the fastest growing regional export flow for the second consecutive year, and it also boosted the trade of Africa and Latin America. The dollar's depreciation and the relative strength of the West European economy were major factors behind the above average performance of Western Europe's import flows. The additional factor of Asia's strong import demand in 1990 helped raise bilateral trade between the two regions. Indeed, over the period 1985-90, Asia's exports to Western Europe and Western Europe's exports to

Asia were the two fastest growing trade flows among the twenty shown in Table 6. Slowing economic growth in North America, in contrast, contributed to the fifth consecutive decline in the annual growth of Asia's exports to that region since 1986.

The sharp decline in the intra-regional trade of Central and Eastern Europe and the USSR – down an estimated 18 per cent in 1990 – was the result of declining output and the unwinding of traditional trade ties within the (now disbanded) Council for Mutual Economic Assistance (see below for more details). While the growth of the region's exports to Western Europe was modestly above the average for world trade as a whole, a portion of the gain is explained by the dollar's depreciation against the ECU.

The figures in Table 6 for the period 1985-90 were also affected by the steep depreciation of the dollar between those two years.[13] Generally speaking, the growth rates of trade flows which were originally denominated in the major European currencies or in yen were, after conversion to dollars, boosted by a strong «valuation effect» relative to the growth rates of trade flows originally denominated in dollars. This would be a particularly important factor to take into account in drawing substantive conclusions from value data for regional trade flows for the period in question (and, indeed, for most other periods).

One of the most pronounced effects of the depreciation of the dollar since 1985 has been the rise in the share of intra-West European trade from 26 to 33½ per cent of world merchandise trade. Unfortunately, there are no comprehensive regional *volume* data for distinguishing between valuation effects and volume developments for each region. Volume figures are available for the European Communities, however. They reveal that an equal expansion in intra-EC and extra-EC imports has taken place since 1986, supporting the view that the expanding import demand of the Communities did not favour its producers over foreign producers.

[13] Between 1985 and 1990, the dollar price of one ECU increased from $0.76 to $1.27; over the same period, the dollar price of 100 yen increased from $0.42 to $0.69.

Table 6

Developments in major inter- and intra-regional merchandise export flows, 1985-90

(Percentage based on value data)

	Share in world merchandise exports	Average annual change		
	1990	1985-90	1989	1990
Middle East to Asia	1.5	3½	25	35
Intra-Western Europe	33.4	18	7	22
Africa to Western Europe	1.5	2	15	20
Middle East to Western Europe	1.0	4	26	18
Western Europe to Asia	3.4	19	11	18
Asia to Western Europe	4.3	21	3	15
Central/Eastern Europe/USSR to Western Europe	1.8	7	7	15
Western Europe to Africa	1.6	6½	2	15
Latin America to Western Europe	1.0	8	9	14
World exports	**100.0**	**12½**	**8**	**13**
Latin America to North America	2.0	6½	12	12
North America to Western Europe	3.6	15	13	11
Western Europe to North America	3.7	8½	2	11
Western Europe to Middle East	1.3	3½	3	11
Intra-Asia	10.3	16½	14	10
North America to Latin America	1.6	11	10	9
Intra-North America	5.1	8	7	9
North America to Asia	3.8	15	12	6
Western Europe to Central/Eastern Europe/USSR	1.3	8½	13	5
Asia to North America	6.0	9½	6	1
Intra-Central/Eastern Europe/USSR	2.2	½	-7	-18

Note: The table contains inter- and intra-regional trade flows which accounted for 1 per cent or more of the value of world merchandise exports in 1990. The share of these twenty regional trade flows combined represent more than 90 per cent of world merchandise trade.

Leading traders

In 1990 Germany passed the United States to become the world's leading merchandise exporter in *value* terms (Table 7). One factor was the unification, which added $22½ billion (if all of the 1990 merchandise exports of the former German Democratic Republic are counted) to the exports of the former Federal Republic of Germany.[14] But even without unification, Germany would have moved into the top spot on the basis of the 16½ per cent rise of the Deutsche mark vis-à-vis the dollar, and in spite of the fact that United States exports expanded 8½ per cent in volume terms in 1990, as against a 1½ per cent gain for Germany's exports.[15]

[14] At the time of unification, the merchandise exports of the German Democratic Republic were approximately equivalent to 5 per cent of the merchandise exports of the Federal Republic of Germany. Corresponding figures for population and land area are 27 per cent and 43 per cent, respectively.

[15] For the former Federal Republic of Germany alone, the dollar value of merchandise exports increased 17 per cent in 1990, compared with 5½ per cent in 1989; the corresponding figures for merchandise imports are 27 and 7½ per cent. Leaving aside the expansion of intra-German trade in 1990, merchandise exports of the former German Democratic Republic are reported to have increased 2 per cent, while imports fell 42 per cent.

Table 7

Leading exporters and importers in world merchandise trade, 1990

(Billion dollars and percentage)

Exporters					Importers				
Rank		1990		Annual change	Rank		1990		Annual change
1990		Value	Share	1990	1990		Value	Share	1990
1	Germany[a]	421	12.1	-	1	United States	517	14.3	4½
2	United States	394	11.3	8	2	Germany[a]	356	9.9	-
3	Japan	288	8.3	5	3	Japan	235	6.5	12
4	France	217	6.2	20½	4	France	234	6.5	21½
5	United Kingdom	185	5.3	21½	5	United Kingdom	223	6.2	12½
6	Italy	170	4.9	21	6	Italy	182	5.0	19
7	Netherlands	132	3.8	22	7	Netherlands	126	3.5	21
8	Canada	132	3.8	9½	8	Canada	124	3.4	4
9	Belgium-Luxembourg	118	3.4	18	9	USSR[b,c]	121	3.3	5½
10	USSR[b]	104	3.0	-5	10	Belgium-Luxembourg	120	3.3	21½
11	Hong Kong[d]	82	2.4	12½	11	Spain	88	2.4	22½
12	Taiwan	67	1.9	1½	12	Hong Kong[f]	82	2.3	14
13	Korea, Rep.	65	1.9	4	13	Switzerland	70	1.9	19½
14	Switzerland	64	1.8	24	14	Korea, Rep.	70	1.9	13½
15	China	61	1.8	17½	15	Singapore[f]	61	1.7	22½
16	Sweden	58	1.7	11½	16	Taiwan	55	1.5	4
17	Spain	56	1.6	25	17	Sweden	54	1.5	11
18	Singapore[e]	53	1.5	18	18	China	52	1.5	-10½
19	Saudi Arabia	44	1.3	57½	19	Austria	49	1.4	26
20	Austria	41	1.2	29½	20	Australia	42	1.2	-6½
21	Mexico[g]	41	1.2	15½	21	Mexico[g]	42	1.2	23
22	Australia	40	1.1	6	22	Thailand	33	0.9	29½
23	Denmark	35	1.0	25	23	Denmark	32	0.9	19
24	Norway	34	1.0	25½	24	Malaysia	29	0.8	30
25	Brazil	31	0.9	-8½	25	Finland	27	0.7	10½
	Total	**2933**	**84.3**	**13½**		**Total**	**3024**	**83.6**	**13½**
	World	**3480**	**100.0**	**13**		**World**	**3610**	**100.0**	**13½**

[a] Combined trade values for the former Federal Republic of Germany and the former German Democratic Republic.
[b] Because of difficulties involved in converting data expressed in the national currency into dollars, the figures are at best rough approximations.
[c] Imports f.o.b.
[d] Includes re-exports. In 1990, they amounted to $53.0 billion compared to $44.3 billion in 1989.
[e] Includes re-exports. In 1990, they amounted to $18.0 billion compared to $16.4 billion in 1989.
[f] Includes substantial imports for re-export.
[g] Includes trade flows through processing zones.

The largest jump in the export rankings in 1990 was recorded by Saudi Arabia, up four places, as merchandise export earnings rose by nearly 60 per cent on the basis of a higher export volume and higher prices for crude petroleum. With the exception of Sweden, the West European traders in Table 7 recorded rates of growth for their exports well above the world average of 13 per cent, representing a marked acceleration relative to 1989. In each case, currency appreciation vis-à-vis the dollar was a more important factor behind the growth in the value of exports than was the corresponding increase in export volume. Among the 25 leading exporters, Austria recorded the second highest growth in 1990 – up 28 per cent over 1989 – helped by the highest volume growth in Western Europe, as exports to Germany surged. Brazil and the USSR, in contrast, recorded absolute declines in the dollar value of their exports.

On the import side of Table 7, Malaysia, Thailand, Singapore and Mexico posted the fastest growth outside of Western Europe, on the basis of strong volume growth. Imports into China, in contrast, declined 10½ per cent while exports grew 18 per cent, resulting in a shift in the merchandise trade balance from a $6½ billion deficit in 1989 to an $8 billion surplus in 1990. The depreciation of the dollar against the French franc in 1990 helped boost France into a virtual tie with Japan for third place among the leading merchandise importers. Imports into the United States expanded at about half the rate of United States exports.

The depreciation of the dollar boosted the growth rates posted by the West European traders of commercial services in the top 25 (Table 8), but performances measured in ECU were also strong. Denmark gained three places in the export

Table 8
Leading exporters and importers in world trade in commercial services, 1990

(Billion dollars and percentage)

Exporters					Importers				
Rank		1990		Annual change	Rank		1990		Annual change
1990		Value	Share	1990	1990		Value	Share	1990
1	United States	119.1	15.5	14½	1	Japan	88.6	11.2	10
2	France	81.9	10.7	25½	2	United States	87.6	11.1	13
3	United Kingdom	55.3	7.2	15	3	Germany	82.1	10.4	25½
4	Germany	51.8	6.7	25½	4	France	65.4	8.3	32
5	Japan	41.6	5.4	5½	5	United Kingdom	44.1	5.6	16
6	Italy	40.8	5.3	7½	6	Italy	38.6	4.9	6½
7	Netherlands	30.2	3.9	19	7	Netherlands	28.7	3.6	16
8	Spain	29.2	3.8	16½	8	Belgium-Luxembourg*	26.5	3.4	17½
9	Belgium-Luxembourg*	27.7	3.6	17½	9	Canada	22.7	2.9	11
10	Austria	22.6	2.9	25	10	Sweden	17.0	2.1	13½
11	Switzerland*	17.3	2.3	17	11	Spain	16.4	2.1	28
12	Canada	15.1	2.0	6	12	Switzerland*	15.5	2.0	17
13	Singapore	14.9	1.9	29	13	Taiwan	15.0	1.9	7½
14	Hong Kong*	14.4	1.9	17	14	Yugoslavia	15.0	1.9	...
15	Sweden	13.7	1.8	19	15	Australia	14.1	1.8	7
16	Denmark	12.9	1.7	32	16	Saudi Arabia	12.7	1.6	36½
17	Norway	12.4	1.6	18	17	Norway	12.5	1.6	17½
18	Mexico	11.3	1.5	15	18	Austria	11.4	1.4	6½
19	Korea, Rep.	10.9	1.4	9½	19	Korea, Rep.	11.1	1.4	20½
20	Australia	10.5	1.4	20½	20	Denmark	10.3	1.3	21½
21	Thailand	7.5	1.0	19	21	Mexico	9.9	1.3	26½
22	Taiwan	7.4	1.0	-1	22	Hong Kong*	9.4	1.2	17
23	Turkey	7.1	0.9	25	23	Singapore	7.9	1.0	23
24	Greece	6.6	0.9	36	24	Finland	7.8	1.0	25
25	Egypt	6.6	0.9	43	25	Thailand	6.3	0.8	40
	Total	**668.6**	**87.3**	**17½**		**Total**	**676.6**	**85.8**	**18**
	World	**766.9**	**100.0**	**17**		**World**	**788.6**	**100.0**	**16½**

* Estimates.

Note: The figures for world exports of commercial services exclude the discrepancy for shipment services (see note to Table 1).

ranking as travel services almost doubled. The strong expansion of exports of travel services in Western Europe is consistent with the view that the negative effects of the Gulf crisis on the travel sector in 1990 were primarily on the cost side (for example, higher fuel prices in the latter half of the year) rather than on the revenue side. Thailand gained five places as imports of transportation services rose sharply as a result of booming merchandise trade, and imports of travel services almost doubled.

A comparison of Tables 7 and 8 reveals that for both merchandise trade and trade in commercial services, the 25 leading traders account for about 85 per cent of world trade. It is also evident that the seven leading exporters (and importers) of merchandise are identical to the seven leading exporters (and importers) of commercial services. Furthermore, among the six leading traders, those with a surplus in merchandise trade (Japan and Germany) have a deficit in trade in commercial services, while the countries with a merchandise trade deficit (the United States, the United Kingdom, France and Italy) have a surplus in trade in commercial services.

Current account trends

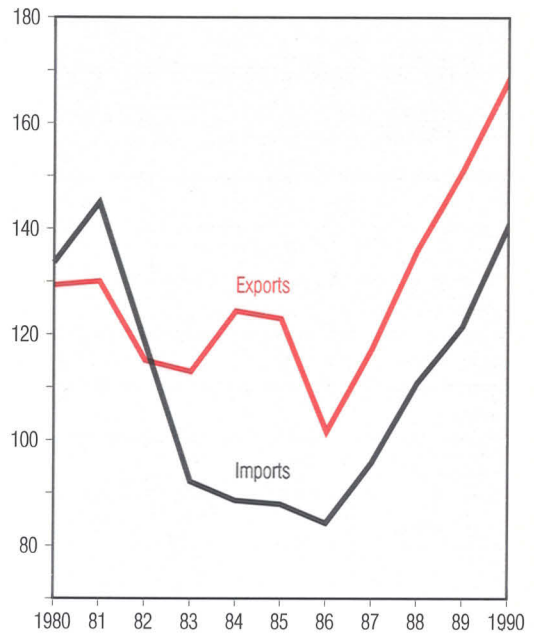
Measured in dollars, the current account imbalances of the United States and Japan continued to decline in 1990 from their respective peaks in 1987. In the United States, the third consecutive year of export growth roughly double the rate for import growth helped lower the current account deficit to $99 billion in 1990, a decline of nearly 40 per cent since 1987. As a share of GNP, the decline in the imbalance is even more pronounced, dropping from 3.6 per cent in 1987 to 1.8 per cent in 1990. The adjustment in 1990 was in part the result of the impact of the slowdown in domestic growth on import demand, combined with continued expansion of overseas sales. Japan's $36 billion surplus in 1990 was less than half the 1987 figure, and brought the surplus-to-GNP ratio to 1.2 per cent (versus the 4.4 per cent peak in 1986). Gulf-related oil price increases were an important factor behind the reduced surplus.

For both the German current account surplus and the United Kingdom's deficit, 1989 was the peak year.[16] This is true regardless of whether the imbalances are measured in dollars or as shares of GNP. For 1990, the latter figures stood at 2.9 per cent for Germany (down from 4.6 per cent) and 2.4 per cent for the United Kingdom (down from 3.8 per cent). Unification was an important factor behind the reduced German surplus, as some potential exports were redirected to the domestic market and import demand was stimulated. In the United Kingdom, weak domestic demand, combined with a pick-up in export growth, led to a reduction in the current account deficit.

Highly indebted countries

The value of merchandise exports from fifteen highly indebted developing countries rose an estimated 11 per cent in 1990, somewhat above the rate recorded in 1989 (Chart 3).[17] Import growth of 16 per cent pushed the nominal value of imports of the group to a level just below the 1981 pre-debt crisis peak of $145 billion (if merchandise imports into the highly indebted countries had kept pace with the growth of world merchandise trade during the period 1982-1990, they would have been around $250 billion in 1990).

Chart 3
Merchandise trade of fifteen highly indebted developing countries, 1980-90
(Billion dollars)



Overall, the aggregate merchandise trade surplus of the 15 countries declined from $28 billion to $25 billion. Within the group, the trade surpluses of those countries which export primarily crude petroleum (Venezuela, Nigeria and Ecuador) increased sharply, while trade balance developments in the other twelve highly indebted countries were mixed. Brazil's surplus declined sharply and Yugoslavia's deficit increased substantially.

[16] The 1989 current account and GNP data for Germany refer to the former Federal Republic of Germany; the current account data for the second half of 1990 include the former German Democratic Republic.

[17] The fifteen countries are Argentina, Bolivia, Brazil, Chile, Colombia, Côte d'Ivoire, Ecuador, Mexico, Morocco, Nigeria, Peru, Philippines, Uruguay, Venezuela and Yugoslavia.

Nigeria and Venezuela recorded two of the fastest rates of merchandise export expansion among the highly indebted countries – 74 and 33 per cent respectively – as higher export volumes were sold at higher prices.[18] For Venezuela, the export sector helped boost the rate of its GDP growth to the highest level in Latin America in 1990. Fuel exports from Mexico and Colombia rose by 24 and 30 per cent, respectively, but the smaller share of fuels in exports lessened the impact on overall export performance. Among the countries which do not export important amounts of fuels, Argentina reported the largest increase in merchandise export earnings (29 per cent) as exports of agricultural products rose by more than 30 per cent in value. With imports below the 1989 level due to the weakness of the domestic economy, Argentina's trade surplus reached a record level of more than $8 billion. Brazil and Peru, in contrast, recorded absolute declines in the value of exports, coupled with sizeable increases in imports.

With the exception of Brazil and Peru, the relation between exports of goods and services and required debt service payments continued to improve for the Latin American debtors in the group. Within the broader group of highly indebted countries, Mexico, the Philippines, and Venezuela reduced outstanding obligations through the Brady plan, and Nigeria obtained limited public debt relief. While per capita incomes remain below the level of the early 1980s in thirteen of the fifteen countries – Chile and Colombia are the exceptions – debt relief and sustained programs of structural reform are pointing to continued (if gradual) improvements in the economic situations of most of the highly indebted countries.

The impact of the Gulf crisis on trade

The direct impact of the Gulf crisis on total world trade in 1990 was relatively minor. When the crisis began, the year was more than half over and much of the trade in the remaining months was already under contract. Prior to the trade embargo, moreover, Kuwait and Iraq together accounted for less than 1 per cent of world merchandise exports.

For a number of individual countries, in contrast, the Gulf crisis had serious trade consequences. In terms of the relative importance of lost export markets for each of the leading merchandise exporters to Kuwait and Iraq, Jordan (19½ per cent of total merchandise exports) was the most adversely affected by the embargo, followed by Turkey (9 per cent), Romania (4 per cent), India (3 per cent) and Yugoslavia (2½ per cent). A decline in exports of commercial services – especially tourism and transportation – also affected many countries in the region. Based on data for the pre-crisis period, aggregate exports of tourism services accounted for about 11 per cent of the total exports of goods and services of countries in the general area in 1989. For Cyprus the proportion was nearly one-half, followed by Kenya, Malta, Jordan, Tunisia and Morocco (20-25 per cent), Egypt and Turkey (about 15 per cent), and Israel (10 per cent). Traffic through the Suez Canal generates about 20 per cent of Egypt's export earnings. Situated on the east coast of Africa, Djibouti's foreign exchange earnings are highly dependent on the provision of port services.

Several countries in the Middle East, Africa and Asia for which worker remittances are an important source of foreign exchange suffered losses not only from the decline in remittances, but also from the costs of repatriating and rehabilitating their nationals (many of whom lost substantial personal assets). Expressing figures on pre-crisis remittances from Iraq and Kuwait to the largest non-Arab sources of foreign workers, as a proportion of the receiving country's total merchandise exports, reveals that the relative importance of earnings from remittances ranged from 2½ per cent (India and the Philippines), 3½ per cent (Pakistan), 6 per cent (Sri Lanka) to 12½ per cent (Bangladesh).[19]

In addition to the loss of exports of goods and services, and of worker remittances, a number of countries in the region also felt the effect of declines in foreign aid and project finance that had been available from Kuwait, Iraq and regional development funds. Other countries were affected by the cessation of Iraqi debt servicing, especially those in Central and Eastern Europe who were being repaid in oil. And, of course, there was the negative impact on oil-importing countries around the world of the higher oil prices in the August-December period.

The least developed countries

Reduced worker remittances and interrupted merchandise and commercial service exports (primarily tourism and transportation) due to the Gulf crisis had a significant impact on the foreign exchange earnings of a number of least developed countries. In addition to Bangladesh, Yemen, and Sudan sustaining significant losses of worker remittances, sharply higher oil prices adversely affected virtually all the least developed countries (with the exception of oil-exporting Yemen). For a number of these countries, events stemming from the Gulf crisis resulted in absolute declines in overall economic activity for 1990.

[18] In both countries, petroleum exports account for more than 80 per cent of merchandise exports.

[19] For Lebanon, Sudan and Yemen, the corresponding percentages appear to be much higher.

Imports of the developed countries from the least developed countries rose by 6 per cent in 1990 to $8.2 billion (Table 9), a deceleration from the 10½ per cent recorded in 1989, and half the 13 per cent growth for total world merchandise trade in 1990.[20] Exports of developed countries to the least developed countries were up 3 per cent in 1990 to $10.7 billion (Table 10). Within the group, wide divergences in trade performances continued to be evident. Developed countries recorded increases of more than 25 per cent for imports from Yemen, Bangladesh, Malawi, the Union of Myanmar and Nepal, while decreases of more than 25 per cent were recorded for imports from Ethiopia, Uganda, the United Republic of Tanzania and Sudan. The 18 per cent rise in developed countries' imports of manufactures from the least developed countries in 1990 was largely due to a 40 per cent increase in shipments of clothing from Bangladesh to the United States and the European Communities (Bangladesh accounts for nearly three-quarters of the developed countries' imports of clothing from the least developed countries).

Trends in the prices of commodities of export interest to least developed countries varied substantially.[21] The price of robusta coffee – an important export item for Uganda, Ethiopia, Burundi, the United Republic of Tanzania and Rwanda – declined by 25 per cent in 1990, reaching a level less than one-half its 1980 peak. Cocoa prices made a modest recovery in 1990 after the sharp decline in 1989, benefiting Equatorial Guinea and Sao Tome and Principe. The price of cotton also rose modestly, helping Benin, Burkina Faso, Chad, Mali, Sudan and Togo. A 10 per cent increase in the price of jute raised the value of exports of jute and jute products from Bangladesh by roughly the same proportion. The world economic slowdown led to weakness in aluminium prices, which had an adverse impact on Guinea and Sierra Leone. In contrast, iron ore prices continued to recover, helping Mauritania. On the whole it is likely that the terms of trade of a number of least developed countries declined in 1990 as a result of the increases in the prices of crude petroleum and manufactures.

[20] Because there are so few up-to-date trade data available for least developed countries, it is necessary to rely primarily on partner country statistics. See Volume II of *International Trade 1990-91* for more comprehensive merchandise trade data. The discussion on least developed countries based on partner trade statistics excludes Botswana and Lesotho, whose trade is accounted for within the South African Customs Union.

[21] For many primary commodities, trends in world market prices differ from the trends in prices received by individual countries in their main export markets. For several commodities of increasing importance to a number of least developed countries, such as fishery products and tropical timber, world market prices are not available.

Table 9

Developed countries' imports from the least developed countries, 1985-90

(Million dollars and percentage)

	Value	Average annual change		
	1990	1985-90	1989	1990
Total	**8200**	**9**	**10½**	**6**
Primary products	5270	6½	15½	-½
Agricultural products	2780	1	-½	-11½
Food	2000	0	½	-16½
Fuels	1500	34	81½	29
Manufactures	2730	14	4	18
Textiles and clothing	1620	20	8½	30½

Table 10

Developed countries' exports to the least developed countries, 1985-90

(Million dollars and percentage)

	Value	Average annual change		
	1990	1985-90	1989	1990
Total	**10700**	**3**	**-4½**	**3½**
Primary products	2500	-3	-2½	-10½
Food	1980	-4	-7	-10
Manufactures	7900	5	-5½	7

Central and Eastern Europe and the USSR

For the second year in a row, the most dramatic trade development for this group of countries was a decline in intra-regional trade – estimated to have been nearly 20 per cent in value terms in 1990, more than twice the decline recorded in 1989.

In part, the drop in trade reflected the poor economic performance of the USSR and the countries in Central and Eastern Europe, all of which experienced moderate to substantial declines in national output in 1990 associated with their respective steps away from centrally administered to more market-oriented economies. At the same time, trade also contributed to the contraction of output in two related

ways. First, the traditional close trade links within the Council for Mutual Economic Assistance (CMEA) caused the economic disruptions in each country to spread quickly to its regional trading partners (in 1988, the region was second only to Western Europe in the importance of intra-regional trade). Second, although the CMEA was not officially disbanded until 28 June 1991, most of the countries were already attempting to redirect trade to the convertible currency areas in 1990, thereby putting additional downward pressure on trade within the region. While the unification of Germany played a role in accelerating the dissolution of traditional trade links – the former German Democratic Republic was the leading trader among the countries in Central and Eastern Europe – the strong import demand triggered by the unification also enlarged the region's opportunities for hard currency exports.

Extra-regional exports were also affected, as exports to developing countries and traditional trading partners in Asia declined. Shipments to the developed countries, in contrast, continued to expand, particularly those to Western Europe (which now purchases about 80 per cent of the region's exports to third countries).

Individual export performances varied widely in 1990, ranging from a moderate increase in the value of Poland's exports to a decline of nearly 50 per cent for Romania (Table 11).[22] With the exception of Romania and Bulgaria, all the countries in the region offset at least partially the decline in their intra-regional exports by increased exports to the developed countries. For the USSR, an important factor behind the decrease in its exports in 1990 was the sharp reduction in exports of mineral products (mainly crude petroleum, petroleum products, and ores and metals). While it is difficult to compare trade statistics because of the considerable differences in the ways countries value trade in non-convertible currencies (see Box 1), it appears that the shift in exports to the developed countries was most pronounced for Hungary, Poland and the Czech and Slovak Federal Republic.[23]

Table 12 provides estimates of the corresponding changes in the value of imports in 1990. Once again, the performances varied considerably. The USSR was the only one of the six countries to report an increase in both intra-regional and extra-regional imports, and only the USSR and Romania recorded an increase in the value of total merchandise imports.

The increased importance of extra-regional trade for Poland, Hungary, the Czech and Slovak Federal Republic and (to a lesser extent) Bulgaria is primarily the result of a strong expansion of exports to the European Communities. Relative to the increase in aggregate imports into the EC from all third countries (up 19 per cent), imports from Poland (up 54 per cent) and Hungary (31 per cent) had especially strong gains (Table 13). Imports of food and clothing from Poland and Bulgaria, as well as imports of iron and steel from all four countries, also recorded gains well above the average for all extra-regional imports into the EC. Despite these gains, the shares of the Central and Eastern European countries in total

Table 11

Merchandise exports of Central and Eastern Europe and the USSR, 1990

(Annual percentage change in value)

	Intra-regional exports	Extra-regional exports	Total exports
Bulgaria	-21	-4	-18
Czech and Slovak Fed. Rep.	-34	4	-17
Hungary	-25	15	-1
Poland	-24	20	5
Romania	-46	-43	-44
USSR	-14	3	-5

Note: Exports to the former German Democratic Republic are included in intra-regional trade.

Table 12

Merchandise imports of Central and Eastern Europe and the USSR, 1990

(Annual percentage change in value)

	Intra-regional imports	Extra-regional imports	Total imports
Bulgaria	-11	-25	-15
Czech and Slovak Fed. Rep.	-26	17	-7
Hungary	-17	6	-3
Poland	-19	-5	-9
Romania	-14	-33	8
USSR	-4	7	6

Note: Imports from the former German Democratic Republic are included in intra-regional trade.

[22] The many data problems, together with adjustments in exchange rates, make it difficult to derive volume estimates corresponding to the value estimates in Table 11. Very rough calculations indicate that: (i) for Bulgaria, Hungary and Romania the percentage change in the volume of total merchandise exports in 1990 was about the same as the change in value; (ii) for Poland and the USSR, the change in volume was about three times the size of the change in value; and (iii) for the Czech and Slovak Federal Republic the decline in volume was about one-quarter the size of the decline in value.

[23] See Appendix Table 2 for a list of the USSR's most important trading partners among non-industrial countries outside Europe.

Table 13

Imports of the European Communities of food, iron and steel and clothing from Central and Eastern European countries, 1990

(Percentage)

	Bulgaria	Czech and Slovak Fed. Rep.	Hungary	Poland	Romania	Central and Eastern Europe	Extra-EC
Total merchandise							
Annual change	25	20	31	54	-29	23	19
Share in extra-EC imports	0.1	0.6	0.6	1.1	0.3	2.8	100
Food							
Annual change	30	8	10	43	-58	22	13
Share in extra-EC imports	0.4	0.5	1.7	2.7	0.1	5.4	100
Iron and steel							
Annual change	48	26	46	57	-20	31	6
Share in extra-EC imports	0.8	3.8	1.8	3.1	0.9	10.4	100
Clothing							
Annual change	70	42	40	77	1	38	32
Share in extra-EC imports	0.3	0.7	1.7	2.5	1.7	6.8	100

Note: Figures for Central and Eastern Europe exclude the former German Democratic Republic.

extra-Community imports of food, iron and steel, and clothing remain modest, ranging from about 5 per cent for food to 10 per cent for iron and steel.[24] The shares are, of course, even smaller when the imports are expressed as a proportion of total Community imports (including intra-EC trade) of the products in question, ranging from around 2 per cent for food to 3 per cent for clothing.

[24] See Appendix Table 3 for details on product groups that are important in each country's trade with the European Communities.

Box 1 – Statistical problems with trade data for Central and Eastern Europe and the USSR

Prior to the switch on 1 January 1991 to carrying out trade in convertible currencies, trade between members of the Council of Mutual Economic Assistance (CMEA) was valued primarily in transferable rubles (TR). Each country converted its TR trade to a domestic currency equivalent using a particular conversion factor (implicit exchange rate). Each country also had an exchange rate between the local currency and the dollar, which was used to convert trade figures expressed in local currency into trade figures expressed in dollars.*

The two exchange rates – the implicit one between the TR and the local currency, and the one between the local currency and the dollar – yield an implicit cross rate between the TR and the dollar for each country. As long as the implicit TR/dollar cross rate is the same for all the countries, a particular trade flow will have the same dollar value, irrespective of whether it is reported by the exporting country or the importing country. Alternatively, if the TR/dollar cross rates are not the same, the dollar value of a given trade flow will vary according to which country's trade figures are used.

In recent years, the implicit TR/dollar cross rates for the Czech and Slovak Federal Republic, Hungary and Poland were much lower than the corresponding rate for the USSR. Consequently, the value of the USSR's trade with its partners in Central and Eastern Europe according to USSR data is more or less double the figures reported by this group of countries.

Another consequence of the different implicit TR/dollar cross rates is that exchange rate changes affect year-to-year trends in intra-regional trade. For example, the devaluations of the Polish zloty and the Czech koruna in terms of the dollar in 1989 depressed the value growth of their intra-regional trade. This means that the apparent decline in intra-regional trade is more pronounced if the data used are those reported by the Central and East European countries than if the data reported by the USSR are used.

The figures on intra-regional trade reported elsewhere in this report are based solely on export data from the individual countries. This procedure yields trade figures which are intermediate between the high and low estimates from the individual countries (for example, with reference to the 1989 column in the table below, the figures $50.4 and $31.6 would be used, rather than $50.4 and $56.8, or $27.1 and $31.6).

Trade between the USSR and Central and Eastern Europe, 1989 and 1990

(Billion dollars and percentage)

	Value		Annual charge
	1989	1990	1990
A. USSR exports to Central and Eastern Europe	50.4	44.4	-12
Imports of Central and Eastern Europe from USSR	27.1	20.4	-25
B. USSR imports from Central and Eastern Europe to USSR	56.8	58.8	3
Exports of Central and Eastern Europe to USSR	31.6	27.8	-12

Note: The USSR data have been adjusted to include trade with the former German Democratic Republic in the fourth quarter of 1990.

* See Box 2, «A cautionary note on trade statistics for Central and East European countries and the USSR», *International Trade 1989-90* for further details.

III. TRADE AND THE ENVIRONMENT

Interaction between international trade and the environment is as old as trade itself. Awareness that the interaction has implications in public policy terms is more recent. Nevertheless, it dates back at least to the trade provisions in the 1933 convention on fauna and flora.[25] In the late 1960s, environmental problems caused by the discharge of waste and other pollutants into the natural environment emerged seriously; and so did concerns over the implications for international competitiveness.

Over the past two decades, producers in countries with stricter environmental standards have worried increasingly about the impact of those standards on their competitiveness in world markets. At the same time, governments and firms in other countries have expressed concern about new barriers being erected against imports produced under less strict standards.

Most recently, there has been growing public concern with issues related to the pollution of the global commons (for example, ozone depletion and climate change), as well as with species diversity and the treatment of animals. This has raised important questions about the use of trade policies to influence environmental measures in other countries.

The objective of this chapter is to provide an initial analysis of these and other interactions between trade and the environment, especially as they affect the multilateral trading system.[26] Part 1 provides, for easy reference, an overview of the main issues and a summary of the principal conclusions. Part 2 explains, on the basis of existing experience and judgement, which environmentally-motivated trade policy actions are permitted by GATT rules, and which are not. This is done with the understanding that the authority to interpret the rules of the General Agreement ultimately rests with GATT's contracting parties, that is, with its member countries. Part 3 examines issues which arise when environmental effects are wholly domestic. Issues which arise when there are transborder physical spillovers into another country or into the global commons are covered in Part 4. The focus shifts in Part 5 to the risk that environmental concerns and policies could lead, wittingly or unwittingly, to inappropriate or even counter-productive restrictions on international trade.

1. Overview and summary

The main issues and principal conclusions can be grouped under five headings: the contribution of trade to a better environment, the need for multilateral cooperation, the role of trade policies, the political economy challenge, and risks and opportunities for the trading system.

The contribution of trade to a better environment

Views differ regarding the impact of international trade on the quality of the natural environment. For some, expanding trade is a source of increased wealth and diffusion of technology, both of which enhance societies' ability to protect and up-grade their environments. Others argue that unrestricted trade can be harmful to the environment, especially when a country's environmental policies are weak or non-existent.

While the latter view does draw attention to certain trade-related environmental risks, there is no reason to assume that growth of per capita income necessarily, or even on average, damages the environment. To begin with, the increases in per capita income – which are boosted by increased market access and expanding trade – provide more resources to contain environmental damage, helping to

[25] The full title of the convention, which is still in force, is the Convention Relative to the Preservation of Fauna and Flora in their Natural State. See Appendix I for a summary of multilateral environmental treaties containing trade provisions.

[26] There is no generally agreed definition of «environment». The moderately broad definition used in this report – which includes the full range of pollution-related problems, plus soil erosion and loss of fertility, deforestation, product safety (food, hazardous wastes), endangered species and the treatment of animals – reflects the range of environmental issues that have been raised in discussions of the linkages between trade and the environment. The inclusion of a particular environmental issue in the analysis reflects not a judgement about the actual or potential seriousness of the problem, but rather only that it is being widely debated and therefore that there is an interest in exploring its possible implications for trade and the trading system.

finance pollution control and remedial clean-up. A country with a stagnant economy, by contrast, will be under greater pressure to stint on improving the environment.

Furthermore, if the average citizen is convinced of the need to devote more material and human resources to achieve a better environment as his or her income rises, the growth of per capita income ultimately will lead to increased expenditure on the environment. The available evidence suggests that this is indeed happening.

The opportunity for countries to trade in world markets for goods and technology facilitates the implementation of needed environment-improving processes at home. These processes often first appear in countries at the frontier of environmental regulation, and products embodying them must be exported if other countries are to catch up. Similarly, trade can help consumers make environmentally beneficial choices – for instance, imports of low-sulphur coal can encourage them to abandon the use of polluting high-sulphur coal. Trade in recycled inputs can help countries economize on resource use.

While trade liberalization is likely to reduce some protectionist barriers which are encouraging environmentally harmful activities, it is also possible that trade liberalization could worsen particular environmental problems in the absence of appropriate domestic environmental policies. Conceivably, an expansion of trade could produce negative environmental effects so large that they outweigh the conventional benefits from open markets (increased specialization, more competition and so forth), resulting in an overall decline in national welfare. However, this is possible only if a country lacks a domestic environmental policy that reflects its environmental values and priorities.[27] If that is the case, the most effective action is to concentrate on introducing appropriate environmental policies rather than trying to work around bad ones by foregoing trade liberalization or attempting to fine-tune interventionist trade policies. A lack of appropriate environmental policies creates problems not just in the trade sector, but throughout every facet of a country's economic life. Manipulating trade policies is not only costly – in terms of a less efficient international division of labour – but also ineffective in dealing with the negative consequences elsewhere in the economy caused by the absence of appropriate environmental policies.

This is evident, for example, in efforts to promote sustainable development. Although that term means different things to different people, most definitions encompass two basic notions.[28] First, there is a need to place much greater emphasis on assigning values or prices to environmental resources, with a view to identifying and valuing the environmental effects of economic activity. Second is the idea that each generation should pass on to the next at least as much capital - environmental and man-made – as it inherited.

Neither aspect of sustainable development is intrinsically linked to international trade. A failure to place a value on environmental resources would undermine sustainable development even in a completely closed economy. Trade is seen, rather, as a «magnifier». If the policies necessary for sustainable development are in place, trade promotes development that is sustainable. Alternatively, if such policies are lacking, the country's international trade may contribute to a skewing of the country's development in an environmentally damaging direction, but then so will most of the other economic activities in the country. Clearly the correct action in such cases is to work for the adoption of an appropriate overall domestic environmental policy, rather than focusing attention on problems that are allegedly trade-related.

The need for multilateral cooperation

Environmental issues can become internationalized in at least one of three ways. The first two, which can occur even when the issues are in principle purely domestic, are through concerns over the impact of environmental policies on international competitiveness, and through the assertion of jurisdiction over other nations' environmental priorities and practices. The third and most obvious way is through the transborder spillover of pollution into another country or the global commons (primarily the upper atmosphere and the oceans). Although current concerns with the environment encompass a wide range of issues, from water pollution to ozone depletion, and the treatment of animals to standards for pesticide residues in food, they all share a common need for multilateral cooperation, not only to minimize potential trade frictions, but especially to identify and implement workable and effective solutions to regional and global environmental problems.

As a result, it is no longer possible for a country to create an appropriate environmental policy entirely on its own. Even when environmental problems are domestic (in the sense that no pollution is escaping across the border), an attempt by countries to go it alone on environmental policies would sooner or later lead to frictions with trading partners and most likely to unilateral trade actions. What is needed is multilateral rules to guide countries in formulating their own environmental policies and in responding to domestic complaints about

[27] This proposition is demonstrated in Anderson (1992c). *Note:* the full details of the references are provided in the list of references at the end of this chapter.

[28] The Annex in Pearce, Barbier and Markandya (1989) contains a compendium of definitions employed by different authors. See also Dasgupta and Mäler (1990).

the impact of their own and other countries' policies on international competitiveness. To back up the rules, a dispute settlement procedure is necessary for handling conflicts that cannot be resolved among the countries concerned. If existing rules and procedures are judged to be adequate for the task, fine. If not, some negotiated changes will be necessary.

When an environmental problem involves a transborder physical spillover, the only alternative to unilateral actions based on economic and political power is for countries to cooperate in the design, implementation and enforcement of an appropriate multilateral agreement for dealing with the problem at hand. This will often also be the case with assertions of jurisdiction over other countries' practices and policies, including the treatment of animals and endangered species.

Regardless of the nature of an environmental problem, the contribution of multilateral cooperation is to reduce the possibility that solutions are affected by differences in the economic and political strengths of the parties involved. Given the justifiable basis for a diversity of environmental standards among countries, it is important to minimize the risk of solutions being imposed by the larger or richer countries.

Negative incentives – in particular, the use of discriminatory trade restrictions on products unrelated to the environmental issue at hand – are not an effective way to promote multilateral cooperation. Alternatively, the use of positive incentives coupled with peer pressure can be a viable option – and all the more so since the likelihood of negative incentives being a workable and sustainable approach in the medium-term and across a range of issues is open to serious doubt.

The role of trade policy

This chapter argues, and there is much support for this view, that unilateral restrictions on trade would never be the most efficient instrument for dealing with an environmental problem. Of course it is always possible to find an example, hypothetical or taken from the real world, which appears to contradict that conclusion. But always at the base of such an example would be a national environmental policy that is considered inappropriate.

If all countries participated in all international environmental agreements, there would be nothing more to add. However, it is often a challenge just to get a critical mass of countries – let alone all countries – to participate in an international environmental agreement. As soon as participation is less than universal, trade policy re-enters the picture, albeit in a different role. Trade measures could be used as one type of «carrot» – or, despite the arguments noted above, as one type of «stick» – to encourage participation.

Past experience suggests that the organizers of an environmental agreement are also likely to consider including trade provisions – that is, measures affecting trade only in the product or products covered by the agreement – designed to minimize the extent to which trade between participants and non-participants could undermine the agreement. Recalling that a country's trade in a particular product is nothing more than the difference between production and consumption, there is also the option of controlling both production and consumption in the participating countries. In this case there would be no need to have separate controls on trade flows.

The risk of protectionist responses

There is much evidence which points to a serious risk of environmental issues and concerns being exploited by protectionists for their own benefit. This can occur at any of several stages: by promoting policies that discriminate against imports as part of the solution to environmental problems, by biasing the choice between positive and negative incentives in favour of trade sanctions, by pushing for the inclusion of unnecessary trade provisions in multilateral agreements, or by deliberately promoting product standards that place a proportionately greater cost burden on foreign producers. These concerns are heightened by the efforts of protectionist groups to draw environmental groups into implicit or explicit alliances.

If the use of inefficient policies to achieve environmental goals were costless for environmental interests, then practical politics might argue for embracing such coalitions whenever possible. But it is not likely to be costless, and certainly not in the medium and long term. Biases that protectionist interests introduce into the environmental policy package increase the costs of environmental improvements. In the longer term, this can only reduce the amount of improvement the society will be willing to undertake. When that happens, the protectionist interests gain not only at the expense of the rest of the economy, but also at the expense of the natural environment.

Risks and opportunities for the trading system

There is a serious risk that the trading system could get badly bruised by a rush to deal with environmental issues which are viewed as urgent by important segments of the population in an increasing number of countries. To someone unfamiliar with, or indifferent to, the contribution of economic efficiency and the trading system to postwar economic

prosperity, trade measures can too easily seem to be low cost and readily available tools for pursuing environmental goals.

As regards the design and implementation of environmental policies, GATT rules place essentially no constraints on the ability of countries to use appropriate policies to protect their environment from damage from domestic production activities or from the consumption of domestically produced or imported products. Concern over the possibility that technical or other kinds of regulations could create unnecessary obstacles to trade has led, it is true, to certain multilateral disciplines. But those disciplines contain qualified exceptions for actions related to protecting or improving the environment.

When the environmental problem is due to production or consumption activities in another country, the GATT rules are more of a constraint, since they prohibit making market access dependent on changes in the domestic policies or practices of the exporting country. The rationale for this is that to do otherwise would invite a flood of import restrictions as countries (especially those with large markets) either attempted to impose their own domestic environmental, economic and social policies on other countries, or used such an attempt as a pretext for reducing competition from imports.

Furthermore, the fact that GATT rules block the unilateral use of trade measures to dictate changes in the environmental policies of other nations does not mean that governments are powerless. They still have the possibility of negotiating a multilateral solution or, failing that, of requesting a GATT waiver. These options offer the prospect of resolving environmental problems and conflicts, while at the same time effectively guarding against the excesses that would result from unilateralism.

In other words, GATT rules could never block the adoption of environmental policies which have broad support in the world community. This is because in most instances the support of two-thirds of GATT's membership – currently 69 out of 103 countries – is sufficient to amend the rules or grant a waiver. What the rules do constrain is attempts by one or a small number of countries to influence environmental policies in other countries not by persuasion and negotiation, but by unilateral reductions in access to their markets.

The real risk, therefore, is not that trade policies will be used, but that they will be used unilaterally. If the door were opened to use trade policies unilaterally to offset the competitiveness effects of different environmental standards, or to attempt to force other countries to adopt domestically-favoured practices and policies, the trading system would start down a very slippery slope. Countries are not clones of one another, and will not wish to become so – certainly not under the threat of unilateral trade measures.

The opportunities presented to the trading system consist mainly in exploiting the various ways in which open international trade can contribute, in conjunction with appropriate national environmental policies, to the improvement and protection of the environment. From an institutional standpoint there is a need for a careful examination of the existing rules to be certain that they do not hinder multilateral efforts to deal with environmental problems. This will be one of the important tasks of GATT's recently activated Group on Environmental Measures and International Trade.

More broadly, the economic growth stimulated by open trade policies increases wealth and spreads knowledge and information, which in turn increase the range of choices available to consumers, including the option of choosing to enjoy the services of a higher quality environment.

2. GATT law and the environment

Within any nation the judicial system spends a good part of its time interpreting the country's laws. Experts can also differ on the applicability of certain laws to particular situations, over what is and is not permitted. It is not surprising, therefore, that GATT's rules and disciplines give rise to issues of interpretation, especially in a relatively new area of concern such as the interaction between trade policy and the environment.

It is possible, nonetheless, to be reasonably precise about what current GATT rules say regarding the use of trade policies to further environmental goals. The first point to stress is the central role of non-discrimination in GATT law.

The rules of the General Agreement are concerned primarily with preventing discrimination, that is, with limiting the extent to which countries can discriminate between home products and imports, between imports from different countries, and between goods sold in the home market and those exported. It is reasonable to conclude, therefore, that even though the General Agreement does not mention the environment explicitly, non-discriminatory environmental policies ordinarily would not be subject to any GATT constraints.

Protecting the nation's own environment

Under GATT's rules, governments can employ many different measures to protect and improve the local environment. Thus, sales taxes on products that can create pollution (those containing chloroflurocarbons, for example), deposit refund schemes for recyclable waste (bottles, scrap cars), or favourable tax treatment of environmentally friendly products

(lead-free gasoline, solar panels for home heating) and other non-discriminatory measures ensuring a pattern of domestic consumption that minimizes pollution would not normally be open to challenge.

There is also nothing in the GATT that prevents contracting parties from taxing or regulating domestic producers who engage in polluting activities – even to the extent of prohibiting the production and sale of particular goods. For instance, ceilings on air pollution levels, and levies on companies that discharge pollutants into lakes and rivers, are fully consistent with GATT rules.

In certain cases, even a measure taken for environmental protection purposes which would otherwise violate GATT obligations not to discriminate may be permitted under Article XX of the GATT. The narrowly-defined exceptions in Article XX permit a contracting party to place health, safety or domestic resource conservation goals ahead of non-discrimination, but only when certain conditions are fulfilled.[29] In general, these conditions ensure that a trade measure is necessary for the achievement of such goals - and that these goals are not used as a pretext for reducing competition from imports.[30]

GATT rules, therefore, place essentially no constraints on a country's right to protect its own environment against damage from either domestic production or the consumption of domestically produced or imported products. Generally speaking, a country can do anything to imports or exports that it does to its own products, and it can do anything it considers necessary to its own production processes.

There are, nevertheless, some points to add. It is accepted among GATT's member countries that technical regulations should not be formulated in such a way as to constitute unnecessary obstacles to trade. Among the agreements signed at the end of the Tokyo Round (which supplement the General Agreement) is the Agreement on Technical Barriers to Trade, whose rules oblige its Parties to use international standards whenever possible. However, it also explicitly allows its Parties to deviate from such standards if they «are inappropriate for the Parties concerned, for inter alia such reasons as ... protection for human health or safety, animal or plant life or health, or the environment; fundamental climatic or other geographical factors; ....» At the same time, any such derogation would be subject to the basic obligation that it does not result in an unnecessary obstacle to trade.

Under this same Agreement, it is also possible for an exporting country to challenge another country's ban on the sale of a particular product on the grounds that the ban is not based on scientific criteria and is thus an unnecessary obstacle to trade.

In a similar manner, the Subsidies Agreement (also from the Tokyo Round) discourages the use of trade-distorting subsidies, but then explicitly recognizes the right of signatories to use subsidies for «the redeployment of industry in order to avoid ... environmental problems».

These various provisions are an attempt to find a reasonable, good-faith balance between the desire to avoid distortions to competition and the desire to allow each country sovereignty over measures affecting its natural environment and the health and safety of its residents. This is not an easy task. The issues are among the most sensitive in any society, and the scientific understanding often is such that it comes down to a matter of subjective risk management (Box 2). Well-informed and fair-minded individuals can differ – sometimes substantially – on where to strike the balance.

When one country seeks to change another's environmental behaviour

Production and consumption activities in other countries can also be a source of domestic environmental concern. Pollution may be spilling over borders and harming either the regional environment (acid rain) or the global commons (ozone depletion). Or land development projects may be threatening the extinction of animal or plant species and uncontrolled fishing may be depleting fish stocks in the high seas. It is not unreasonable that the government of a country concerned by such practices would seek to see them changed – and that it would find it difficult to accept that this would not be possible.

There are various options for attempting to induce changes in the production or consumption behaviour of another country. However, unilateral increases in import barriers are not, prima facie, among them.

In principle, it is not possible under GATT's rules to make access to one's own market dependent on the domestic environmental policies or practices of the exporting country.

The requirement not to discriminate between different sources of imports – which of course applies to a much broader range of issues than just those related to the environment – is intended not only to prevent trade distortions. It exists also to protect each member of GATT from the unilateral imposition of domestic standards or policies by

[29] Article XX also contains the exception which allows countries to discriminate against imports produced by prison labour.

[30] Answering the question of whether a particular trade measure is «necessary» involves one or both of two considerations: whether other measures consistent with the General Agreement are reasonably available to achieve the goal and, if not, whether it is the least trade distorting way of achieving the goal. For a more general discussion see, for example, Charnovitz (1991), McDorman (1991) and Petersmann (1991).

Box 2 – Sanitary and phytosanitary risk management

Countries often have elaborate programs for the assessment and management of risk to determine the measures needed to ensure safe food supplies for humans and animals, to protect plants and animals from pests or diseases, and to protect humans from diseases which may be carried by animals or by plants. The GATT recognizes the right of countries to maintain such measures subject to the requirement that the measures do not arbitrarily or unjustifiably discriminate between countries where the same conditions prevail, or are not a disguised restriction on international trade (Article XXb).

There are three principal steps in sanitary and phytosanitary risk management which give rise to opportunities for introducing restrictions on trade, inadvertantly or otherwise.

First, *risk assessment* involves evaluation of either:

– the likelihood of a pest or disease becoming established or spreading and its potential consequences, or

– the potential adverse effects on human or animal health as a consequence of additives, contaminants or toxins in foods, feedstuffs or beverages.

The evaluation of plant and animal pests or diseases must be based not only on information about the pest or disease itself and its means of reproduction or contamination, but also on the ecological conditions (that is, climate, geography, and associated biota) which may foster or limit its spread, and the susceptibility of animal or plant populations (the zoosanitary and phytosanitary conditions). The evaluation of contaminants in foods requires information on chemical properties such as acute and chronic toxicity, carcinogenecity, and teratogenecity. Sanitary and phytosanitary measures are not limited to the protection of commercial species, but are applied also for the protection of wild flora and fauna. For pesticides, evaluation of the ways in which the pesticide affects the environment, particularly ground water, is also often required. Clearly, an improper assessment of risk, for example because of lack of information, misrepresentation of facts or the inclusion of inappropriate factors, may result in unwarranted barriers to trade.

Second, determining the *acceptable level of risk* – the appropriate level of health or sanitary protection – requires a judgement that reflects, among other things, a society's values. Uncontrollable and unknown factors often make it prohibitively expensive or impossible fully to guarantee safety. More generally, government authorities seek instead to determine levels of «no unreasonable risk» or «negligible risk» because of the excessive costs of approaching «zero risk» relative to other competing objectives such as ensuring adequate food production, efficient use of resources, and the economic benefits of production and trade. «Tolerance» levels may be set which indicate, for example, the maximum amount of a contaminant which will be permitted. In certain cases, where the consequences of acting otherwise could be severe, a zero tolerance, or no measurable level, may be set.

Third, perhaps the greatest potential for disruption of international trade occurs in the selection and application of health and sanitary *risk management measures.* Government authorities make risk management decisions which specify conditions or levels of use of particular products in order to limit associated risks to acceptable levels. These measures may include quarantine requirements, chemical use restrictions, vaccination policies, processing regulations, testing, inspection and certification requirements. Various measures may achieve equivalent results in terms of health protection, but have very different consequences with regard to trade. Where importing countries insist on their own testing or certification procedures, delays and uncertainty about results present further costs to traders. The manner by which requirements are administered may also pose unnecessary burdens on imported goods.

The degree of complexity in risk assessment, flexibility in setting the level of acceptable risk, and discretion in determining risk management measures all imply that countries may occasionally, perhaps under interest-group prodding, impose unwarranted, trade-inhibiting restrictions. One of the objectives of the Uruguay Round negotiations is to establish disciplines that will permit governments to provide the necessary protection for humans, animals and plants while minimizing the adverse effects that such measures may have on international trade.

importing countries through the threat of market access restrictions. It protects trade relations from degenerating into anarchy through unilateral actions in pursuit of unilaterally-defined objectives, however valid they may appear.

If the goal is to influence environmental policies and practices in other countries, the option which is most consistent with orderly international relations is inter-governmental cooperation leading to a multilateral agreement (see Part 4 below). By offering each country the opportunity to explain and defend its view of the problem, the negotiating process increases the chances of uncovering solutions acceptable to all the affected parties. Cooperative efforts also offer the best chance of ensuring that the policy changes deal directly with the problem at hand and that they provide minimum scope for protectionist abuses.

Trade provisions in multilateral environmental agreements

One of the first tasks of the recently activated GATT Group on Environmental Measures and International Trade is to consider the trade provisions in environmental agreements vis-a-vis the obligations of contracting parties under the GATT.[31] Of the 127 multilateral agreements in the area of the environment, 17 have trade provisions (Table 14).

The majority of environmental agreements with trade provisions are those concerned with the protection of fauna

[31] The Group has also been asked to examine the transparency of national environmental regulations which are likely to affect trade, and the trade effects of packaging and labelling requirements intended to protect the environment.

and flora. For example, the parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), including the producing states, have agreed to a ban on trade in ivory. Import bans are also applied by certain countries to whales, flying foxes, polar bears, North Pacific fur seals, migratory birds, and many other species.

The goals of such environmental agreements can probably be best achieved if the participating countries ban all sales of the endangered animals or plants, not just their importation or exportation. The GATT permits its contracting parties to ban the domestic sale of a product and to enforce such a ban at the point of importation or exportation provided, of course, that the ban applies regardless of the origin or destination of the product. The most effective way of applying these environmental agreements is therefore likely to be also the one that would ensure consistency with the GATT.[32]

When foreign products are subjected to a more stringent treatment than domestic products, there is a potential source of conflict with the GATT's national treatment provision. As noted earlier, the GATT does, however, permit a difference in treatment as an exception under Article XX(b) for measures necessary to protect human, animal or plant health or life in the importing country. For example, phytosanitary regulations deal with the spread of pests and disease across borders through international trade in plant material. Various plant protection agreements permit rigorous inspection and even prohibition of imports.

Another possible source of conflict with the GATT rules occurs when an environmental agreement specifies a difference in the trade measures affecting parties and non-parties. For example, the trade provisions of the Montreal Protocol, the Basel Convention, and CITES (for those species in which managed trade is permitted) require parties to apply more restrictive trade provisions to non-parties than to parties. GATT's member countries have not as yet been required to take a decision on whether such departures from the non-discrimination principle can be justified under Article XX.

It is not clear that such departures from the non-discrimination principle are always necessary to achieve the environmental goal of the environmental agreement. For example, the parties to the Montreal Protocol on chloroflurocarbons (CFCs) could have structured the Protocol in such a way that it reduced consumption of CFCs in the participating countries by the target amount, without the necessity of including provisions for special restrictions on trade with non-parties.[33] Since, however, the drafters had other goals as well, including that of providing compensation to CFC producers in the participating countries (by allowing them to receive extra profits from selling the diminishing quantity of CFCs), trade provisions which discriminate against non-participants were included in the Protocol.[34]

Table 14
Multilateral environmental agreements by subject, 1933-90

(Number of agreements)

	Total	With trade provisions
Marine pollution	41	0
Marine fishing and whaling	25	0
Protection of fauna and flora	19	10
Nuclear and air pollution	13	1
Antarctica	6	0
Phytosanitary regulation	5	4
Locust control	4	0
Boundary waters	4	0
Animal cruelty	3	1
Hazardous wastes	1	1
Other	6	0
Total	127	17

Changing GATT's rules

Provided there was broad support for the idea, GATT's member countries could decide to allow the imposition of import restrictions on exports from countries whose environmental regulations were considered to be « inadequate ». This could be done by amending or supplementing the provisions of the General Agreement, or by the granting of a waiver. Regardless of the way in which the change was made, it would be necessary to define inadequate environmental regulation and to develop procedures and criteria that would minimize the chances of abuse.

Under Article XXV, waivers of specific GATT obligations may be granted to individual contracting parties or to all contracting parties. They are adopted by a two-thirds majority of the votes cast, with the added requirement that the majority must comprise more than half of the contracting

[32] It should be noted that import duties and export taxes are consistent with the rules of the General Agreement, provided they do not exceed the bindings set out in a country's schedule of concessions. While most of the major trading nations as well as an increasing number of developing countries have bound nearly all of their import duties, they have not negotiated bindings on export taxes.

[33] One way would be to impose taxes on the consumption of CFCs, or a quota on domestic consumption implemented by a system of auctioned domestic sales licenses which permitted the license holder to buy from all potential suppliers, regardless of whether they are in a participating country. In either case, the scarcity value of the reduced amount of CFCs would accrue to the government (in the form of tax or auction receipts). Production of CFCs in participating countries could then be regulated by quotas set at the projected level of consumption in those countries.

[34] See Enders and Porges (1992).

parties. Waivers are granted subject to conditions ensuring that the privileges accorded are used for the intended purpose.

If most of GATT's contracting parties agree to participate in a particular multilateral environmental agreement, the consistency of its trade provisions with GATT is not likely to be a problem since there would be enough votes to secure a waiver, if necessary. In situations where the environmental objective for which the agreement is to be negotiated is of interest to only a few countries, it would also be possible for the interested countries to request a waiver if the trade measures which they propose to adopt are not consistent with their GATT obligations. The success of their request would depend on their ability to convince enough contracting parties of the wisdom of granting the waiver.

In dealing with transborder environmental issues, use of the waiver approach would ensure that the proposed trade policy actions would be focused on the environmental problem in question, and that they would be transparent, multilaterally negotiated, have broad support among the GATT membership, and be subject to conditions designed to avoid abuse.

This is not to imply that waivers offer a ready way around GATT obligations. The prevailing view is that waivers are to be granted only exceptionally and for a limited period of time, and that they are not a substitute for revisions of the rules.

Experience with the GATT dispute settlement process

The ways in which GATT rules operate in the environment area, including their role in preventing protectionist abuses and attempts to impose standards unilaterally on other countries, become more tangible in actual trade disputes. In the past decade, the GATT dispute settlement process has produced five panel reports that include relevant interpretations of GATT rules in the environmental area.[35]

In two of those disputes a contracting party had banned imports or exports, and claimed the ban was justified under Article XX(g) as a measure relating to the conservation of exhaustible natural resources. One involved a United States ban on imports of tuna and tuna products from Canada. In 1982 the GATT Council adopted the panel's recommendations, which rejected the United States' claim that its embargo was justified on conservation grounds, the main basis for the rejection being that the United States had no catch limits for its own fishing fleets on most of the species of tuna it was embargoing.[36] In the second case, involving a Canadian ban on exports of unprocessed herring and salmon, the panel report adopted in 1988 found that because there were no limits on Canadian consumption of herring and salmon, there was no link between conservation of those species and the export prohibition.[37]

As the panel in the Canadian herring and salmon case said, the purpose of including Article XX(g) in the General Agreement was not to create a loophole for discriminatory or protectionist trade policy measures, but to ensure that GATT rules would not hinder conservation policies.

In a third case, Thailand sought to justify a virtual ban on imported cigarettes under Article XX(b) as a measure «necessary to protect human, animal or plant life or health». The panel's report, adopted in 1990, accepted that smoking endangers human health and that measures to reduce cigarette consumption were permissible.[38] It agreed that Article XX(b) permitted a contracting party to put health goals above its trade obligations, but that the discrimination against imported cigarettes had to be «necessary». The panel did not see any reason why it was necessary to ban cigarette imports while leaving domestic production and sales of cigarettes unrestricted. The panel found that other, non-discriminatory measures could meet the health goal.

A panel report adopted in 1987 dealt with a complaint brought by Canada, the European Communities and Mexico against United States taxes on petroleum and certain imported substances, the proceeds of which were used to help finance a «Superfund» for cleaning up toxic waste sites.[39] The European Communities had argued with respect to one of those taxes that special rules, including the OECD's «polluter pays principle» (PPP), had to be applied because the tax concerned pollution. The panel found, however, that the GATT rules on border tax adjustments apply regardless of the purpose of a tax, that the PPP had never been adopted by the GATT, and that the tax in question was a legitimate border tax adjustment. On the other hand, the panel found that another tax, imposed on imported petroleum at a higher rate than domestic petroleum, was inconsistent with GATT rules on national treatment.

The most recent environment-related dispute involved Mexico's challenge to a United States embargo, under the Marine Mammal Protection Act, of imports of yellowfin tuna

[35] The dispute between the United States and the European Communities over the use of growth hormones in beef production is not on this list because it has not entered the formal GATT dispute settlement process.

[36] See GATT, *Basic Instruments and Selected Documents,* Twenty-ninth Supplement, p. 91.

[37] See GATT, *Basic Instruments and Selected Documents,* Thirty-fifth Supplement, p. 98.

[38] See GATT, *Basic Instruments and Selected Documents,* Thirty-seventh Supplement, p. 200.

[39] See GATT, *Basic Instruments and Selected Documents,* Thirty-fourth Supplement, p. 136.

Box 3 – Tuna and dolphins

Schools of yellowfin tuna often swim beneath schools of dolphins in the eastern tropical Pacific Ocean. As a result, when tuna are fished with purse seine nets, dolphins can be trapped in the nets and will die unless released. The United States' Marine Mammal Protection Act (MMPA) sets dolphin protection standards – involving a ceiling limit on dolphin catches – for the domestic fishing fleet and for countries whose fishing boats harvest yellowfin tuna in the eastern tropical Pacific Ocean. If a country exporting such tuna to the United States cannot prove to the United States authorities that its tuna fleets meet the dolphin protection standards set out in the law, the United States government must embargo all imports of yellowfin tuna and tuna products from that country and from «intermediary» countries that purchase tuna from the country subject to the direct embargo. Under this law, the United States government has prohibited imports of yellowfin tuna and tuna products from Mexico, Venezuela and Vanuatu, and from the intermediary countries of Costa Rica, France, Italy, Japan and Panama.

In February 1991, Mexico asked for a GATT dispute settlement panel, arguing that the United States' embargo on yellowfin tuna and tuna products was inconsistent with GATT provisions. The United States argued that the GATT's national treatment provision (Article III) permitted the enforcement at the border of dolphin protection standards set out in the MMPA. The Panel found that the standard of Article III – namely, that imported products be accorded no less favourable treatment than domestic products – required a comparison between products of the exporting and importing countries, and not a comparison between production regulations of the exporting and importing countries that had no effect on the product as such. Therefore, the United States could not embargo imports of tuna products from Mexico simply because Mexico's regulations affecting the production of tuna did not satisfy United States regulations.

The United States also argued that the import embargo could be justified under the Article XX exceptions clauses for measures otherwise inconsistent with GATT obligations, which protect animal health or exhaustible natural resources. However, the Panel found that Article XX does not permit a contracting party to take trade measures to enforce its own laws regarding animals or exhaustible natural resources outside its jurisdiction.

The reasoning behind these findings was as follows. If the United States' arguments were accepted, then any country could ban imports of a product from a country merely because the exporting country pursues environmental or health policies different from its own. This would create a very large loophole in the GATT for any country unilaterally to apply trade restrictions not for the purpose of enforcing its own laws within its jurisdiction, but to impose the standards set out in its laws on other countries. In such a situation, the potential for protectionist abuses would be very great. It would certainly work against the main objective of the multilateral trading system – to provide stable and predictable market access opportunities through agreed rules and disciplines.

The Panel's task was limited to examination of this matter in the light of existing GATT obligations. It was not asked whether either party's environmental policies as such were appropriate. In finding that a country may not restrict imports of a product solely because it originates in a country whose environmental policies are different, the Panel stressed the all-or-nothing choice which Article XX presents. If the GATT contracting parties wished to permit environmental trade restrictions such as those under the United States dolphin protection law, they would need to agree on limits to prevent abuse. Since Article XX does not provide such limits, the Panel stated that it would be better to amend or supplement the provisions of the General Agreement or to provide a waiver, since each of these alternatives would provide an opportunity for the contracting parties to develop and negotiate provisions to minimize the risk of excessive use and abuse.

Another issue Mexico had raised before the Panel concerned the United States' Dolphin Protection Consumer Information Act, which requires that if tuna products are labeled «Dolphin safe», they must meet certain dolphin protection standards. The Panel found that this labelling practice was not inconsistent with GATT provisions, because it was designed to prevent deceptive advertising practices on all tuna products, whether imported or domestically produced.

Copies of the panel report are available on request from the GATT Secretariat.

and tuna products from Mexico, and a United States law regulating labelling of tuna products as «Dolphin Safe», which Mexico claimed discriminated against its products. The dispute settlement panel found in Mexico's favour on the embargo, but upheld the United States labelling law (Box 3). This case differs, it should be added, from the other four cases in that the GATT Council has deferred consideration of the panel's report for formal adoption (this was done on the basis of a joint request from Mexico and the United States, which are trying bilaterally to resolve the dispute).

3. «Domestic» environmental issues and world trade

In principle, domestic environmental problems – that is, those which do not involve physical transborder spillovers – can be resolved by purely domestic policy choices. Such choices are made on the basis of various considerations. For instance, a government evaluates the costs of immediate environmental damage prevention as against the longer-term costs of eventual clean-up if prevention is foregone. And it assesses, by whatever measures are available, the nation's own priorities regarding the trade-off between income and environmental quality.[40] These decisions are, of course, taken within the framework of the international environmental conventions to which it is a signatory.

[40] The absence of official (written) environmental regulations is not evidence of a lack of national environmental standards. As long as the quality of the environment has not fallen below the society's implicit environmental standards, the society is not likely to feel a compelling need to make its standards explicit through formal legislated regulations.

This holds for pollution caused both by production activities (such as the dumping of waste by-products into a lake or river) and by consumption activities (for example, the disposal of household waste or smog caused by automobile emissions). Governments also set health and safety standards for goods and services consumed in the domestic economy, reflecting their own evaluation of the risks and the correct approach to risk management (Box 2 above), as well as domestic regulations regarding the humane treatment of animals and procedures to follow in situations in which a species is threatened with extinction.

Economic analysis strongly supports the view that effective solutions to problems involving purely domestic environmental problems are not likely to involve trade policies that discriminate against imports. That is, judged on the basis of economic efficiency, there are almost no practical circumstances in which such a trade policy measure would be the «first best» tool for dealing with such problems.[41] There would appear to be, therefore, no implications for trade policy in general, or for the GATT in particular.

Nevertheless, despite the intrinsically domestic character of the problems and the policy choices to be made when pollution remains within borders, these issues have become internationalized. This has happened in two ways: one stems from a concern with the implications for firms' competitiveness, the other from attempts to assert jurisdiction over the environmental priorities of other countries.

The competitiveness issue

In discussions about international competitiveness a catching metaphor from sports is often used: is there a «level playing field»? The change in the world economy that propels most forcefully the unfair trade crusade is the rise in the trade-to-GNP ratios of many countries and the associated dramatic increase in the criss-crossing of foreign investments. As the globalization process has reduced the «economic distance» between countries, everyone tends to be in everyone else's backyard. This has led to more intense import competition in domestic markets and ever-fiercer export competition in third markets.[42]

While these trends are signs of success for the international trading system they are also fertile ground for allegations that unfair advantages are accruing to rivals – especially so given the subjectivity of «fairness», as that term relates to international competition. Firms which find their market shares and profits under competitive pressure are prone to label as unfair any source of cost advantage enjoyed by their foreign rivals.

Environment enters the picture

When it comes to the impact of environmental policies on production costs, demands by domestic producers for a «level playing field» often find support among environmental groups. One reason is their fear that if «lower» standards abroad regarding industrial pollution are perceived at home to be detrimental to competitiveness, they could give rise to political pressures to lower the standards at home. The competitiveness argument thus tends to bring industry and environmental lobbies together in attacking lower standards abroad. One notion is that the lower standards lead to «ecological dumping» – a choice of words which evidently seeks to forge a link between environmental policies and the «fair trade» debate.

In practice, if a lowering of domestic environmental standards is ruled out, demands for a level playing field take one or more of three forms:

– that the countries with lower environmental standards harmonise up to the higher standards in the importing country;

– that the imports of foreign products considered to be produced in «environmentally dirty ways» be subjected to special duties designed to offset the «unfair cost advantage» from the less strict standards;[43] or

– that the domestic industries be given subsidies to cover the added costs of meeting the higher standards.

[41] See, for example, Anderson (1992c), Lloyd (1992) and Snape (1992), as well as Bhagwati (1971) and Corden (1974). This conclusion rests on a general approach based on the fact that the policy instruments available to achieve a particular goal generally can be ranked from the most efficient to the least efficient, with the most efficient policy instrument being the one which operates directly on the source of the problem. Instruments further down the list – and trade policy is typically far down it – are more costly for two related reasons: first, because they are further removed from the source of the problem, and second, because they generally create undesirable «by-product distortions» in other areas of the economy.

[42] See, for example, Bhagwati (1991) and Porter (1990).

[43] On 25 April 1991 legislation was introduced in the United States Senate which would allow the imposition of special duties on imports produced under environmental standards that are less strict than those in the United States (*International Trade Reporter, 1.5.91*). More recently, the Chairman of the Finance Committee's International Trade Subcommittee proposed negotiating multilateral rules that would allow countries with high environmental standards to impose special tariffs on goods coming from countries with lower standards, in order to offset any unfair lower production costs (*Inside U.S. Trade,* 20.9.91).

Under existing GATT rules, to increase a country's tariffs on products originating in countries with less strict environmental policies is very difficult, for two reasons. First, if the tariffs in question are «bound» under the GATT – as is the case with nearly all tariffs of the industrial countries and with an increasing number of tariffs in developing countries – they cannot be raised except through an elaborate re-negotiation process. Second, and much more to the point, such tariff increases would violate GATT's «most favoured nation» (MFN) principle.

There are objective considerations which suggest that countries near the top of the development ladder are likely to have different priorities from countries further down the ladder, and that as a result they are likely to have and enforce stricter environmental standards. This appears to be borne out quite well in practical experience (see Box 4 for a specific example involving air pollution).[44]

The existence of less strict environmental standards in a lower income country, therefore, is not a sufficient basis for claiming that the environmental standards are «too low» or that the country is manipulating its environmental standards in order to improve the competitiveness of its producers. To substantiate such a claim, it would be necessary at the very least to demonstrate that the standards are even lower than would be expected on the basis of such factors as the level of per capita income and the characteristics of the physical environment.

Clearly, that would be very difficult to do. Moreover, the charge might also be aimed at highly developed countries in which stringent environmental standards may have been adopted in some areas but where, because of competitiveness considerations, governments have shied away from high standards in others.[45] In short, any move to impose unilaterally special duties on imports of goods and services produced in countries with less strict environmental standards is likely to be very divisive for the multilateral trading system in particular and international relations in general.

There are other problems with proposals to neutralize the effects of environmental policies on competitiveness. When the environmental problems are strictly domestic (do not involve physical spillovers onto other nations), the differences in policies are properly regarded as domestic choices reflecting, among other factors, the domestic trade-offs between income and environment. Seen thus, the differences in costs of production due to differences in standards can well be an additional source of gainful trade among these nations – as are any number of other natural advantages.[46]

It is also important to recognize that in principle there is no difference between the competitive implications of the type raised by different environmental standards and the competitive consequences of many other policy differences between countries. Differences between countries in tax and other policies toward savings and investment affect the capital stock, which means that countries encouraging capital formation may be enhancing their competitive advantage in capital-intensive industries. Large expenditures on education, and immigration policies which selectively encourage the immigration of skilled labour, will encourage competitive advantage in skill-intensive industries vis-à-vis countries whose policies do not favour the skilled. The extent of government support for science education can influence competitive advantage in high-tech industries.

The list is almost endless. Where is the line to be drawn if the competitive implications of differences in so many government policies are to become a source of demands for the neutralization of the consequences for trade?

It is time to look beyond the immediate context of each such demand – and environment is only the latest example – and to see the danger looming. Inevitably differences exist between countries stemming from their varying histories, social aspirations, political objectives and constraints, and

[44] See, for example, Baumol and Oates (1979, pp. 176-80; 1988, Chapter 15), Thompson (1973, p. 73), Tucker (1982, Chapter 1), Bernstam (1991) and Anderson (1992 a,b). A 1978 study by Walter and Ugelow, based on questionnaires sent to national officials in developed and developing countries, found that while the strictness of environmental policies varied within each group, the level of strictness was nonetheless higher on average in the developed countries.

Judging from reports in the press, it is in the rapidly growing economies – such as the Republic of Korea, and Taiwan – that environmental awareness and concern is the greatest among developing economies. In a recent paper, Chung (1991) summarizes the results of surveys taken in the 1980s by the Republic of Korea's Ministry of Environment. These record a sharp increase in public concern with environmental quality, and Chung concludes that the «data suggest that the income elasticity of demand for environmental preservation is quite high in Korea».

This is not to say that the average person with a lower income is less sensitive to environmental pollution than the average person with a higher income, but simply that the evidence suggests his or her spending priorities are different. Nor does it mean that the level of per capita income is the only factor that matters. It seems plausible that the demand for a cleaner environment could also be stimulated by such factors as increases in education and information (both positively correlated with per capita income), as well as reductions in the cost of pollution control. Ideas and information can spread quickly and diffusion is not always fastest in countries with high per capita incomes (see, for example, Weiner (1990) on compulsory primary education and banning child labour). Moreover, the declining cost of information on health and environmental effects of economic activities by itself is contributing to the adoption of stricter environmental standards by an ever-larger number of countries.

[45] For example, a recent article in the European edition of the *Wall Street Journal* (8 July 1991) described the concern among some United States legislators regarding the activities of the White House Council on Competitiveness in the environment area. According to the article,

> Among other things, the council has been instrumental – either directly or through informal talks within the executive branch – in blocking a proposal to require recycling at municipal incinerators; putting off a plan to discourage the incineration of lead batteries, a source of toxic pollution; and softening a proposal to improve visibility in the Grand Canyon by sharply reducing sulphur-dioxide emissions from a nearby power plant.

The article also quotes the chairman of the House Environment Subcommittee as stating that «The Council on Competitiveness has taken on the task of helping polluters block (the) EPA's efforts to write clean-air regulations with the unabashed purpose of protecting industry from the cost of regulation.» Other legislators, it should be added, strongly defended the activities of the Council.

[46] For more on the economics of this issue, see for example Anderson (1992c) and Bhagwati (1992).

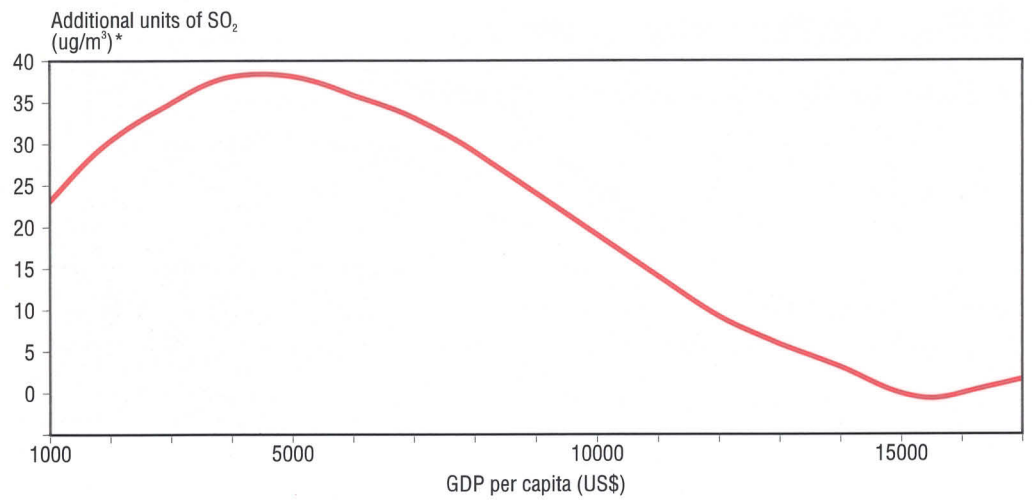
Box 4 – Income and pollution

On *a priori* logic, economic growth need not worsen pollution. But, empirical evidence to prove the point is not always easy to find. A recent study suggests, however, that income growth has been associated with reduced pollution over significant ranges of per capita income.*

The study is based on data collected by the Global Environmental Monitoring System (GEMS). The GEMS project – a joint venture of the World Health Organization and the United Nations Environmental Programme – has monitored air quality in urban areas throughout the developed and developing world since 1976. Concentrations of sulphur dioxide and suspended particles are measured frequently by comparable methods in several different locations in each of the participating cities.

Analysis of the data related the levels of pollutants to various characteristics of the sites and cities (whether the site was situated in the city-centre or suburbs, whether the city was situated on a coast or not, its population density, and so forth) and to the level of per capita GDP in the country in which the city was located.

The chart below – depicting the variation in sulphur dioxide pollution attributable to variation in per capita income across countries and time – is typical of the study's findings. Concentrations of SO_2 have risen with income at low levels of per capita GDP, fallen with income at higher levels of per capita GDP, and eventually leveled off in the most advanced economies. The estimated turning point comes at about $5,000 (1988 US dollars). The conclusions for smoke pollution are much the same as those for SO_2 pollution.



* Grossman and Krueger (1991). The numbers on the vertical scale indicate the amount of *additional* SO_2 pollution a city located in a country with a given level of per capita GDP is likely to have *relative to* a city in a country with a per capita GDP of $15,000-$16,000 (holding constant the values of the other explanatory variables, such as population density). Noting that there are only two countries in the sample with per capita incomes in excess of $16,000 (the United States and Canada), the authors observe that while the curve turns upward in this range, «this probably should not be viewed as strong evidence for a renewed positive relationship between national product and SO_2 pollution at high levels». (p. 15) The curve is based on 95th percentile figures (that is, 95 per cent of the observations during the year at each site recorded a lower level of SO_2 concentration, and 5 per cent a higher level of SO_2 concentration).

economic circumstances. These are differences that cannot simply be ironed out to produce a generalized policy structure that is a clone of policies favoured by other countries. To allow each contracting party unilaterally to impose special duties against whatever it objects to among the domestic policies of other contracting parties would risk an eventual descent into chaotic trade conditions similar to those that plagued the 1930s.

Competitiveness has always been a major concern of the GATT. The rules and disciplines regarding non-discrimination and national treatment are part of a broader concern with the stability and predictability of market access and with the need to ensure that trade can take place in an undistorted manner. At the same time, the contracting parties have been careful to consider as trade distorting only a limited range of measures. The fact that most policies and regulations

differ from country to country has not been considered trade distorting, even though it is recognized that those differences can affect international competitiveness. To do otherwise would most likely bring chaos to the conduct of international trade.

Keeping the competitiveness issue in perspective

Empirical studies generally suggest caution in asserting that cost differences due to differences in environmental regulations are substantial, or that the trade and investment effects within particular industries are large.[47] There is, it is true, limited evidence of cross-border relocation by business firms in response to national differences in environmental policy climates.[48] A number of copper smelters, petroleum refineries, and asbestos, ferroalloy, and vinyl chloride plants reportedly were constructed abroad rather than in the United States for environmental reasons in the 1970s and early 1980s. Similarly, a number of petrochemical complexes and chemical plants originally slated for Germany and the Netherlands were evidently re-sited in Belgium, France, and Spain.[49] And some Japanese pollution-intensive investments were reportedly channelled to developing nations in Southeast Asia and Latin America. But the evidence, viewed on a world scale, certainly does not suggest massive relocation of investment.

Several factors may help explain why a significant redirection of foreign investment and trade in response to variations in environmental standards has not been observed. For example, site-shifting within countries was feasible and considered preferable in a number of instances. More importantly, reduced environmental costs from investing abroad almost certainly were often counterbalanced by other considerations, such as labour availability and quality, wage rates, supporting infrastructure, tax incentives, market size, transport costs, and country risk.

[47] See, for example, Siebert (1977), McGuire (1982), Walter (1982), Tobey (1990), Grossman and Krueger (1991) and Low (1991). When considering the impact of pollution controls on firms' production and investment decisions, two points need to be kept in mind: first, recalling the insights offered by the «effective rate of protection of value added» approach to the analysis of trade barriers, the pollution control costs should be related – data permitting – to value added rather than to total output or sales; and second, because the products of polluting industries tend to be highly standardized intermediate goods which are purchased in bulk by other industries, the price elasticity of demand as between different sources is likely to be high.

[48] Gladwin and Walter (1976), and Gray and Walter (1984).

[49] See Rauscher (1992) for a general analysis of the impact of regional trade liberalization on the environment and welfare of countries within and outside the region. Environmental aspects of the proposed North American free trade agreement are examined in Chapter 7 of Hufbauer and Schott (1992).

Firms are also finding that marketing their products to environmentally-conscious consumers as environmentally «safer» or «cleaner» can offset the impact of higher pollution abatement expenditures. The evident international diffusion of environment-consciousness suggests a ladder where those who incur the pollution abatement costs now are likely to be followed later by others. In turn, this means that investment expenditures in abating pollution, and technical changes and innovations induced by environmental policies (more stringent than elsewhere at any point of time), will position the leaders to compete more effectively in the future even if they reduce competitiveness now. In other words, for many sectors there is almost certainly a «J-curve» at work here: competitiveness declines initially but rises soon thereafter.[50]

Competitiveness: objecting to higher standards

So far the discussion has focused on competitiveness concerns triggered by measures designed to deal with production-related pollution. Competitiveness concerns of a different kind arise in connection with measures in the areas of consumption pollution and health and safety standards. Here the issue takes the form of complaints by foreign

[50] Environmental policies clearly stimulate trade in new goods, services and technology. For example, a sample of titles of recent press articles includes: «IBM to Become Green Consultants», «U.S. Environmental Firms Expected to Prosper», «New Dutch Muckrakers Aim to Make Profit Not Pollution» and «Growing Array of Firms in Europe Are Starting to Play the Green Card: Even Arms Manufacturers See Profit in Goods and Services With Environmental Angle». (*Financial Times,* 6.2.91; *Journal of Commerce,* 27.5.91; *International Herald Tribune,* 2.7.91; and the European edition of the *Wall Street Journal,* 12.7.91, respectively). See also Cairncross (1991). This view receives strong support from Michael Porter in his recent book *The Competitive Advantage of Nations* (1990, pp. 647-48):

> »Stringent standards for product performance, product safety, and environmental impact contribute to creating and upgrading competitive advantage. They pressure firms to improve quality, upgrade technology, and provide features in areas of important customer (and social) concern. ... Particularly beneficial are stringent regulations that anticipate standards that will spread internationally.»

Although this reasoning suggests that low income countries with less strict environmental standards are not likely to claim a big share of the expanding market for environmentally-related goods and services, firms in those countries could have an edge in developing new goods and services geared to the environmental needs of low income countries. For example, the private Brazilian firm Heliodinamica S.A. is currently engaged in the development of solar energy, as well as participating in the growth of the microelectronic industry by producing monocrystalline silicon electronic grade wafers. It also has the capability to design complete photovoltaic as well as solar energy hot water generation systems for industrial, commercial and residential applications. The company is presently exporting to India and other developing countries (as well as to Australia, Spain, the United Kingdom and the United States) and has been approached by other developing nations, including India, Argentina, Kenya, Pakistan, Nigeria, Peru and Bangladesh, with the aim of acquiring photovoltaic know-how (in 1990 Heliodinamica was chosen by the International Trade Center (UNCTAD/GATT), to receive ITC export development support).

Box 5 – Notifications related to the environment under the Agreement on Technical Barriers to Trade

Signatories to the Tokyo Round Agreement on Technical Barriers to Trade are required to notify other Parties through the GATT Secretariat of products to be covered by their proposed technical regulations. Each notification includes a brief indication of its objective and rationale if the regulation differs from international standards (or where international standards do not exist), whenever the regulations are expected to have a significant effect on the trade of other Parties. The protection of human health or safety, animal or plant life or health, or the environment are among the reasons foreseen in the Agreement for which Parties may find it appropriate to adopt technical regulations or standards which differ from international standards (where they exist).

Since the middle of the 1980s, protection of the environment has become more widely cited as an objective and rationale for applying technical regulations. Indeed, from 1980 to 1990, 211 notifications of this nature were made. A further 168 similar notifications were made, but citing grounds of public health and safety.

These notifications can be sorted into the following nine broad categories according to areas of environmental concern and the product(s) to which the technical regulations apply.

Area of environmental concern	Objective/Rationale	
	Protection of the environment	Public health and safety
1. Air pollution, particularly by exhaust emissions, including use of unleaded gasoline and alternative fuels for motor vehicles	71	9
2. Noise emissions: motor vehicles, boats, aircraft, tools and machinery, household appliances	20	24
3. Water pollution, particularly by detergents, marine paints and chemicals, feedstuffs for marine fish farming	12	0
4. Hazardous substances:	87	94
(a) General	5	1
(b) Ozone-depleting substances, particularly CFCs and halons, including implementation of the Montreal Protocol	16	0
(c) Polychlorinated phenyls (PCPs, PCBs and PCTs)	6	3
(d) Fertilizers, pesticides, insecticides, fumigants, and equipment for their application	20	51
(e) PVC, chlorine	3	0
(f) Heavy metals, particularly mercury and cadmium	3	6
(g) Other chemicals, toxic products and dangerous preparations	32	20
(h) Asbestos and related products	2	13
5. Waste: recycling and disposal, including batteries and accumulators	8	2
6. Transport of dangerous products	5	11
7. Radiation	3	6
8. Conservation of endangered species	3	0
9. Energy conservation	2	22
Total	211	168

producers that the importing country's regulations or standards are too strict, rather than – as with controls on production pollution – complaints by domestic producers that foreign standards are too lax.

Consumption pollution. Many countries have strict controls on pollution associated with consumption. Examples include emission control equipment on automobiles, packaging requirements to reduce solid waste, and limitations on the phosphate content of detergents. If any of the products which are causing pollution are imported, it is only reasonable that they be subjected to the same taxes or regulations as the domestic versions since the pollution stems from the consumption of the products (rather than their production) and therefore is independent of where they were produced.

In contrast to the production pollution case, where some producers have to comply with stricter environmental standards than others, in this case the domestic and foreign producers are on essentially equal footing - all of them have to equip their automobiles with catalytic converters, or supply their products in environmentally friendly packaging, or find benign alternatives to phosphates. The equality of treatment inherent in controls on consumption pollution substantially

reduces, but does not eliminate, the potential for frictions over the impact on competitiveness.[51]

Health and safety standards. As environmental awareness has increased, the use of health and safety standards has become more common (Box 5). From the viewpoint of competitiveness, health and safety standards for domestically consumed goods and services have much in common with policies for reducing consumption pollution. In both cases, for example, there is no dispute over the need for the standards to apply equally to domestic and imported versions.

There are, however, important differences that make trade disputes over health and safety standards more likely and more intense than disputes over policies dealing with consumption pollution. These include the inherent uncertainty stemming from consumers' perceptions and psychology, the subjectivity of many standards stemming from the inexact nature of their scientific basis, differences between countries in their attitudes toward risk, and the keen sense of national sovereignty over health and safety issues. Nowhere has this been more evident than in the long-running dispute between the United States and the European Communities over the use of growth hormones in beef production. Precisely because of these unavoidable differences in the views of countries on the reasonableness, scientific or otherwise, of even nondiscriminatory trade restrictions imposed because of safety and health concerns, it is important to have available both multilateral disciplines and an impartial dispute settlement mechanism.[52]

The assertion of jurisdiction over environmental priorities in other countries

The internationalization of otherwise purely domestic environmental issues can come from an altogether different source, namely the assertion of a right to have a voice in determining production processes in other countries. This assertion of jurisdiction can be based on a variety of grounds: the preservation of endangered species that belong to a foreign habitat; an objection to foreign production processes which are considered cruel and inhumane to animals, such as the incidental killing of dolphins in purse seine nets or the use of leghold traps in fur trapping; or a general objection to the pollution of the natural environment in other countries even though the pollution remains entirely within their borders.[53]

Demands for suspending the trading rights of other nations when they do not comply with the expectations of external groups seeking to assert their own environmental priorities over others are often the consequence of these pressures. One recent example is the dispute over imports of Mexican tuna into the United States (see Box 3 above). In another, involving Japan's imports of the shells of hawksbill sea turtles (which are on the endangered species list), the United States threatened to ban imports from Japan of all animal products, including more than $300 million in fish, plus pearls. Japan responded by agreeing to ban importation of the shells by the end of 1992. It is doubtful, however, that such unilateral approaches can be generalized or sustained over a long period.

Just as it would be difficult to contain the competitiveness argument, it is difficult to think of a way to effectively contain the cross-border assertion of priorities. If governments suspend the trading rights of other nations because they unilaterally assert that their environmental priorities are superior to those of others, then the same approach can be employed on any number of grounds. Protectionists would welcome such unilateralism. They could exploit it to create embargoes, special import duties and quotas against rivals by enacting national legislation that unilaterally defines environmental agendas that other countries are likely to find unacceptable.

Changing the world trading rules so as to permit the suspension of trading rights of others by individual contracting parties, based simply on the unilateral and extra-territorial assertion of their environmental priorities, undoubtedly would be difficult because many countries would consider such a change to be a big step down a slippery slope. But this does not mean that alternative policy options are unavailable. There are always alternative means of influencing environmental objectives and practices in other nations' jurisdictions, short of using the unilateral trade weapon.

[51] A recent issue which has caused trade frictions involves the requirement that certain liquids – such as mineral water, soft drinks and beer – be retailed in returnable bottles. Foreign bottlers claim that such a requirement adds much more to their costs than it does to the costs of local bottlers. Other aspects of environmentally-motivated packaging regulations are also receiving increased attention (see, for example, the December 6, 1991 issue of the *Financial Times*).

[52] For more on this issue, see for example, Kozloff and Runge (1991).

[53] In cases where a domestic environmental issue is internationalized because jurisdiction over others' environmental practices and policies is being asserted, there is a formal similarity to the class of cases - examined in Part 4 below – where there are physical spillover effects across nations. For want of a better term, such cases could be described as involving psychological – as distinct from physical – transborder spillover effects. The «pain» from such spillovers can be as real as that from physical spillovers such as acid rain. On the other hand, there is an important difference as well. Such spillovers risk becoming, in practice, open-ended (a characteristic they share with demands for global harmonization of standards to avoid competitiveness effects). On the other hand, the number of potentially harmful physical spillovers is inherently more limited and hence they are far less likely to open up a Pandora's box of demands ranging well beyond environmental concerns.

One example is consumer-based actions, including the promotion of environmental labelling so that consumers can easily concentrate their purchases on products produced in what they consider to be environmentally safe ways.[54]

Again, there is nothing under customary international law and practices that would prevent nongovernmental organisations in one country from actively diffusing their environmental ideas to residents of other countries, so as to create popular support for changes in environmental policies. This would open the door, in turn, to inter-governmental cooperation and the creation of a multilateral agreement to set standards for the activity in question – surely a realistic option considering the 127 multilateral environmental agreements noted in Table 14.

A role for trade policies?

At the beginning of the analysis of «domestic» environmental issues, it was noted that it is very unlikely that using a trade measure would be the most efficient way of dealing with a domestic environmental problem. Is this conclusion altered by the evident internationalization of such problems?

When competitiveness concerns are at work, the answer is no. To use trade policies in this case (to neutralize the trade and investment effects of different national pollution standards) would be inefficient for a number of reasons. First, it would block an opportunity for a mutually beneficial expansion of trade. Second, it would not necessarily cause the other countries to alter their environmental policies. An added drawback is the fact that it could be the exports of the lower income countries that would be hardest hit. Ironically, by reducing their economic growth it may even reduce their ability and willingness to pay for environmental improvements.

What if the «domestic» issues are being internationalized instead by foreign groups or governments asserting their jurisdiction over the country's environmental priorities? Here the answer regarding the role of trade policies is different because the underlying issue is different. The primary question is not one of efficiency, but of enforcement. Is a trade measure the best instrument for getting an «uncooperative» country to change its environmental practices and policies?

Again the risk is that such a use of trade measures would lead to similar actions based on international differences in priorities in a wide range of other areas of economic and social life. And, since the trade measures would be necessarily discriminatory, their unilateral use would raise serious questions regarding their consistency with GATT obligations. Alternatively, if there is a shared consensus on a particular problem which leads to a multilateral agreement, the issue of using trade policy to ensure compliance by non-parties to the agreement may have to be addressed. This question is precisely the one that arises when environmental issues involving transborder physical spillovers are at issue.

4. Physical spillovers and multilateral cooperation

What if the pollution does not remain within the country's borders? Pollutants can contaminate a lake, river or sea that is shared by other countries, or cause acid rain in countries located far down wind. The discharge of carbon dioxide (CO_2) and CFCs into the atmosphere may cause global warming or ozone depletion. Once transborder or global physical spillovers become a serious concern to people in other countries, governments will seek to control or eliminate them.

Since what one nation does or does not do can be seen to impact directly on another's health, safety and domestic environment – even if the scientific evidence can be a matter of dispute – inter-governmental cooperation is likely to be essential to finding a solution. In addition to resolving disputes about the direction and magnitude of these impacts, both efficiency and equity considerations must be addressed as part of the solution.

Efficiency issues arise because if different countries have different costs of abatement, then global efficiency would require that those differences be taken into account in minimizing the cost of reducing the environmental damage. The contribution to be made by each country to the solution of the environmental problem would then vary, the incidence falling more where the costs of abatement are less. Equity issues arise, in turn, because each country's contribution to the globally efficient clean-up effort may not match either its share of the pollution being emitted or its ability to pay. In such instances, securing multilateral cooperation will not be easy, even if awareness of the environmental effects is acute and the necessity for a multilateral solution is agreed.

These issues, and the question of the appropriate role of trade policy in multilateral solutions, are illustrated by the debate over deforestation and global warming. Indeed, this is an area where there is evidence both of contemplated unilateral actions (such as proposals to use import restrictions to persuade countries to reduce the cutting of their tropical forests) and of efforts at multilateral cooperation.

Debates on global warming have stressed a connection between deforestation and the increase in carbon dioxide in the atmosphere. While it is generally accepted that reducing

[54] See OECD (1991) for a discussion of environmental labelling in the OECD countries.

CO_2 levels is likely to involve both reduced CO_2 emissions and action to slow or reverse deforestation, opinions differ as to which approach to emphasize. Countries which consume large amounts of fossil fuels (the principal source of CO_2 emissions) stress the need to preserve the forests. Other countries, concerned about foreign pressure to curtail the commercial exploitation of their forests, argue instead for a primary focus on reducing CO_2 emissions in high energy consumption countries.

One way of viewing this situation is that forests provide carbon absorption services to a world that is dumping increasing amounts of carbon into the atmosphere. Countries with a high ratio of forests to domestic carbon emissions effectively export carbon absorption services to the rest of the world. But because they are not paid for the exported services, they have little incentive to take such services into account when deciding how to use their forests. The result is most likely a faster rate of deforestation than would otherwise occur, which in turn creates concern among other countries.

Given that the countries which are home to large tropical forests are currently exporting carbon absorption services (and biodiversity services) to the rest of the world free of charge, there is a certain logic to the view that they should be offered compensation for reducing the rate of exploitation, rather than be threatened with restrictions on their exports. Yet in many importing countries the discussions have tended to focus on proposals to ban or tax imports of tropical timber in order to protect forests abroad.[55] Furthermore, as Box 6 suggests, even a complete ban on trade in tropical logs would have at best only a very minor effect on the pace of global deforestation. Compensation, in contrast, represents a general inducement for exporting countries to reform the full range of policies and activities which are currently depleting their forests.[56]

Imposing unilateral trade restrictions in pursuit of environmental goals is likely to be inefficient – as in the case just cited – and it raises problems of legal consistency and bad precedent for the trading system.

Trade measures in multilateral agreements

There can be little doubt that cooperative action among countries is superior to unilateral action in the case of a transborder spillover. This has implications for trade and trade policies because it is evident from existing and proposed agreements, as well as from recent bilateral developments, that governments and environmental interest groups see a role for trade policy in the promotion and enforcement of international cooperation on environmental issues.

Augmenting the incentives to participate can be important, especially when there is an urgent need for an agreement. There are at least four reasons why a country might decline, at least initially, to join other countries in trying to solve an environmental problem: first, the country may find the scientific evidence unconvincing, and therefore either not accept that there is a problem, or believe that the risks are exaggerated, or that the proposed remedies will be ineffective; second, it may accept that a particular environmental problem exists, but attach a low priority to solving it; third, it may disagree with the proposed allocation of responsibility, among the countries involved, for dealing with the problem; and fourth, the country simply may be trying to free ride on the efforts of other countries to solve the problem.[57]

Fortunately, the difficulty of recruiting participants generally is not an unsurmountable obstacle since environmental agreements typically do not require that all countries actively participate in order for the agreement to deal effectively with the problem in question. Many countries' activities make only a marginal contribution to a particular problem, which usually means they can make only a marginal contribution to solving it. On the other hand, lack of participation can raise political problems related to reciprocity and fairness.[58]

[55] It is sometimes argued that a general export ban on raw timber would enable the producing countries to achieve a target level of foreign exchange earnings at a lower resource cost because it would stimulate the domestic processing industry, thereby increasing the amount of domestic value added associated with a given level of wood exports. As far as economic growth and rising per capita incomes are concerned, this is an unpromising proposal since it could lead a country to expand industries in which it does not have a natural comparative advantage. Moreover, a ban on the export of unprocessed timber may not even increase foreign exchange earnings for any given level of timber harvesting (or, what is the same thing, maintain a constant level of foreign exchange earnings for a reduced harvest). It is true that an export ban may achieve a sufficient reduction in the domestic price of raw timber to make a previously uneconomic timber processing industry privately profitable. But that industry requires capital and labour in addition to logs. Insofar as these resources are drawn from other sectors producing tradable goods, the foreign exchange earned or saved by those other sectors will diminish. This may well more than offset any increase in foreign exchange earnings from the processing of timber. In other words, maintaining a target level of net foreign exchange earnings will generally require more, not less, harvesting of raw timber if a ban is imposed on log exports.

[56] On policies which encourage deforestation, see for example Repetto and Gillis (1988), Mahar (1989), Binswanger (1991), Grut, Gray and Egli (1991), Southgate, Sierra and Brown (1991), Pearce (1991, Chapter 8), and Cairncross (1991).

[57] See Blackhurst and Subramanian (1992) for additional details. See also Cooper (1989) for an examination of how a lack of agreement on scientific issues blocked international cooperation in controlling the spread of contagious diseases for nearly seventy years. Regarding the income distribution effects of alternative environmental policies on the distribution of income, see Lloyd (1992), Snape (1992), Winters (1992) and Hoekman and Leidy (1992). The free rider situation is considered in Piggott, Whalley and Wigle (1992) and Enders and Porges (1992).

[58] *See, for example, MacNeill, et al.* (1991 p. 106), and Hahn and Richards (1989).

Promoting cooperation on environmental issues

Promoting cooperation involves creating incentives which can be negative or positive. Negative incentives can take various forms, including discriminatory trade measures that penalize exports of products which are unrelated to the environmental problem at hand. In any individual situation, it may be tempting to rely on such measures. But it is very unlikely that such an approach would be a sustainable way of dealing over time with the variety of environmental issues facing the world community.[59] Among other things, by generating resentment and commercial frictions in the case at hand, it reduces the prospects for inter-governmental cooperation on future problems. This and other drawbacks no doubt explain why none of the existing multilateral environmental agreements contain provisions for discriminatory trade measures to be taken against unrelated products in the case of non-participation or defection. It may also be that governments recognise that their own economies are likely to be damaged by new trade barriers.

When cooperation is not voluntarily forthcoming, positive incentives are the best way to achieve sustained inter-governmental cooperation. Positive incentives can include offers of financial assistance and transfers of environmentally friendly technology directly related to the problem at hand, as well as more broadly based offers, for example, to increase foreign aid, to lessen debt problems and to make non-discriminatory reductions in trade barriers.[60]

It is useful to distinguish between (a) negative and positive trade measures applied to products which are unrelated to the environmental problem at hand, and (b) trade provisions applicable to related products. The distinction is useful because the scope for the latter type of trade measures is relatively limited, whereas there is essentially no limit to the use of trade measures on unrelated goods and services.[61]

Probably the best-known example of trade provisions in an environmental agreement are those in the Montreal Protocol on CFCs, though many earlier agreements covering fauna and flora contain similar trade provisions. The primary purpose of trade provisions in such agreements is to prevent trade between non-participants and participants from undermining the effectiveness of the agreement. Trade provisions often also have the incidental effect of treating non-participants less favourably than participants. Again, what distinguishes this from the use of negative incentives is that the products affected by the trade provisions are directly related to the environmental problem in question.

Trade provisions which are not essential to prevent the undermining of an agreement would be, of course, de facto negative incentives. Recalling the discussion of GATT rules in Part 2 above, it is also important to keep in mind that as long as participation in an environmental agreement is not universal, trade provisions will be, like negative trade incentives, discriminatory.

5. Protection and the environment

There are many examples, from many countries, of current government policies in such areas as agriculture, forestry, transportation and energy that have led to environmentally damaging behaviour.[62] It hardly needs to be added that the policy makers did not set out deliberately to create policies that would harm the environment. Nonetheless, that was the result. In such situations, policy reform would increase income and improve the environment at the same time. A case in point – and one which is particularly relevant to the interaction between trade and the environment – is agricultural policies in many of the developed countries.

Agriculture and the environment

There is little doubt that modern agricultural production often degrades the natural environment. Water, air and soil are subject to pollution by chemical fertilizers and pesticides, as well as by concentrations of manure from intensively farmed livestock. Chemical and pesticide residues in food are also a growing concern to consumers. When sloped land is ploughed, the result can be soil erosion and silting of downstream dams, and irrigation can create salinity problems. Would then the effect of trade liberalization be to accentuate these adverse effects or to diminish them?[63]

[59] Authors either fail to mention negative incentives when they discuss ways of encouraging participation in agreements or explicitly caution against the use of such measures. See Sand (1991), MacNeill, *et al.*, (1991), Chayes and Chayes (1991), Mohr (1990) and Stern (forthcoming).

[60] See, for example, MacNeill, *et al.* (1991, pp. 85-86).

[61] In practice, it may not always be easy to draw a line between unrelated and related products. For example, the Montreal Protocol on CFCs contains provisions covering not only trade in CFCs, but also imports of semiconductors that have been washed with CFCs and exports of CFC-related technology.

[62] In MacNeill *et al.* (1991, p. 33, footnotes omitted), the authors note that

> Energy subsidies can, and usually do, favour large supply projects and undermine funding for biomass and renewables. Tax concessions for logging, settlement, and ranching can accelerate deforestation, species loss, and soil and water degradation. Pesticide subsidies can promote excessive use and thereby threaten human health, pollute water, and increase the number of pesticide-resistant species. Subsidies for water-resource development and water use can lead to overuse for irrigation and industrial and municipal purposes.

They go on to cite specific examples from Germany, Japan, the United States, Canada, Brazil, Indonesia, China and India.

[63] See Eckholm (1976) and OECD (1989) for details on these and other environmental problems associated with agricultural production. A recently released joint study by two Dutch research institutes (RIVM and RIZA, 1991) concludes that much of the groundwater under farms in the European Communities is seriously polluted with pesticides and nitrates. According to the study, which fed samples from around the EC into a statistical model, farming is by far the most important source of the water pollution.

The answer to this question clearly depends in part on the impact of liberalization on the distribution of agricultural production around the world. Broadly speaking, current policy distortions in food production have led to high prices and other forms of support for farmers in most high income countries and low relative prices for farmers in many low income countries.[64] Reductions in farm support and increases in market access in highly-protected countries would cause a partial shift of agricultural production from farms in those countries to more competitive producers, including ones in the low income countries.[65] Clearly, this relocation of production would bring income gains to both groups of countries, with the gains being even larger if there were also policy reforms in the countries whose policies tax their farmers.[66]

The environmental effects of agricultural trade liberalization are more difficult to predict because it requires information on, for example, likely shifts in input use. However, several empirical studies offer insights into what might be expected to occur. One aspect concerns the use of chemical fertilizers and pesticides, which is highly correlated with prices received by producers. For example, countries with relatively low producer prices (such as Argentina, Australia and Thailand) use less than one-tenth the amount of chemical fertilizer per hectare used by high price countries in Europe.

Further, a study of rice production in several Asian countries in the late 1970s revealed that both fertilizer and pesticide use were highly correlated with the domestic producer price of rice. In the United States, land set-aside programs have caused farmers to devote more effort to increasing yields on remaining land, which almost certainly has involved increased per-acre use of chemicals. High support prices in land-scarce countries, backed-up by protection at the border, have a similar impact on chemical use. Moreover, support prices and deficiency payments in both North America and Europe have discouraged crop rotation and diversification which are natural alternatives to the intensive use of fertilizers.[67]

It is not unreasonable to conclude from such evidence that the positive environmental effects of the decline in the use of chemical inputs in the high income countries are likely to be substantially greater than the adverse environmental effects of the increased use of such inputs in the low income countries following a liberalization of world food trade. In other words, these several findings point to the conclusion that existing agricultural protection not only fails to help the environment, but almost certainly is an important source of environmental degradation.

There are fears that a partial shift of farm production from high income to low income countries would lead to large-scale deforestation. Such fears appear to be exaggerated. Evidence from Argentina and forest-abundant Brazil, for example, indicates that while the use of labour and capital equipment is reasonably responsive (and fertilizer use, starting from a low level, very responsive) to increases in prices received by farmers, the amount of land in cultivation is not. Recent studies of the agricultural sectors in China and Thailand point to the same conclusion.[68] In other words, in many countries most of the additional output would come from a more efficient use of existing farm land. It is also necessary to keep in mind that clearing land for farming in response to higher prices is only one of several causes of deforestation (see Box 6).

[64] In its *World Development Report 1986* the World Bank observes: Developing countries clearly tend to tax agricultural commodities and thus encourage imports and discourage exports ... Industrial countries, in contrast, tend to support domestic production and thereby inhibit imports and encourage exports ... Agricultural prices and costs are the key to the profitability of investment in agriculture. In industrial countries, resources are diverted from other sectors to agriculture. In developing countries, ... resources are diverted from agriculture to industry ... This makes developing countries export less and import more, even though they could become – if they are not already – efficient producers by making investments to acquire the necessary technology. (pages 11, 125)

As Krueger *et al.* (1988) demonstrate, most of the «taxation» of agriculture in the eighteen developing countries in their study occurred indirectly as a result of (i) an overvalued exchange rate, and (ii) industrial protection which depressed the prices of agricultural commodities relative to those of nonagricultural tradable goods.

[65] The following discussion of liberalizing trade in food products draws heavily on Anderson (1992a, b), where interested readers can find a more detailed development of the analysis as well as the supporting empirical data.

[66] Many food-importing low income countries would be among the gainers, either because they switch to the status of food exporters at the higher relative price of food or because their gains from higher domestic food prices (which attract labour and capital into agriculture and away from less efficient but protected manufacturing industries) more than offset the decline in their terms of trade. Those current net-food importers which would not become food exporters would, nonetheless, experience an increase in food self-sufficiency (see Anderson and Tyers, 1991).

[67] See Anderson (1992a,b), Avery (1991, p. 216) and Barbier and Burgess (1991).

[68] The study by Fan (1991) found that in China during the 1965-85 period – when real prices received by farmers increased very substantially – none of the growth in farm output was attributable to land expansion and only 8 per cent to increased labour use. A quarter of the output growth was attributed to increased fertilizer, a quarter to the introduction of the household responsibility system from the late 1970s, one fifth to greater machinery use and one sixth to technological change (Fan, 1991). Phantumvanit and Panayotou (1990) estimated that for the period 1962 to 1989, the elasticity of demand for cultivated land with respect to the lagged price of agricultural crops was only 0.08. That is, a 10 per cent aggregate output price increase would result in less than a 1 per cent increase in cultivated area.

Box 6 – Restricting trade in tropical timber

One especially unconvincing case for trade restraints on environmental grounds involves tropical timber. A number of groups have called for export or import restraints on tropical timber because of various concerns, including the effect of commercial logging in alienating the land of aboriginal peoples living in tropical forests, in contributing to the loss of genetic diversity of timber species and to the potential extinction of plants and animals, and in reducing the absorption of CO2 from the atmosphere.

Attention to date has focused on tropical log trade. To what extent would a general ban on trade in tropical logs reduce deforestation? The answer is: hardly at all, for the following reasons:

– only 0.5 per cent of log production in developing countries is exported in log form;[1]

– a ban on log exports would simply encourage logs to be sawn and perhaps processed into panels before being exported from developing countries (but with more wasting of timber and other resources because of relatively poor sawmill technology and management);[2]

– even if a ban on trade were extended to include sawn wood and wood panels made from tropical logs, it would have only a minuscule effect on felling, because even the sum of log plus processed timber exports amounts to less than 1 per cent of the trees felled in developing countries;

– through lowering the price of tropical timber, such a ban would reduce the incentive to protect existing forests and to establish new ones in developing countries;

– four-fifths of trees felled in developing countries are used as fuel directly or in the form of charcoal. This is largely because people are too poor to be able to purchase other fuels such as kerosene and need, in any case, to clear land (often slash-and-burn style) to be able to produce food for their growing population in the absence of enough paid employment opportunities; and

– little more than half the world's timber comes from tropical countries, so attention also needs to focus on forest management in industrial countries.

Should a developing country nonetheless take account of the concerns of other (including industrial) countries when determining its policy on forests? A country with a low ratio of carbon emissions per hectare of forest is effectively exporting, free of charge, «carbon absorption services» to the rest of the world. However, since it is not paid for those services (and for maintaining wilderness areas and a diversity of species), it has little or no incentive to take such services into account in deciding on the optimal management of its forest resource. The argument that it should maintain its forests because «they belong to the world at large» is unpersuasive to many people. After all, the argument goes, almost 80 per cent of the greenhouse gas emissions resulting from human activities are generated in industrial countries, so it is those countries which should look to solutions to global warming rather than ask lower-income countries to provide the solution.

Reducing emissions of greenhouse gases is obviously the most direct way to reduce the threat of global warming. But if deforestation is considered undesirable for other reasons, then some form of international agreement and possibly compensation to lower-income countries which are home to large forests needs to be considered. Perhaps the most effective way to slow the deforestation of tropical countries, however, is to promote employment and income growth for rural people in those countries, for example through economic policy reform at home and access to markets abroad.

[1] These and other trade data are taken from the Food and Agriculture Organisation's *Forest Products 1978-1989*, Rome, 1991.

[2] In 1978 more than 95 per cent of Indonesia's wood exports were in the form of logs, whereas now more than 90 per cent are in the form of sawn wood and wood panels. In its 10 August 1991 edition, *The Economist* noted that Swedish sawmills use 98 per cent of a tree whereas Malaysian mills use only 40 per cent.

Liberalizing protectionist agricultural policies in the high income countries is therefore likely to (i) cause the world's food to be produced with fewer chemicals, which in turn would reduce chemical residues in food and in the natural environment; and (ii) have at most a very modest impact on the rate of deforestation. It would also increase the availability of land for recreational and aesthetic uses – including the replanting of forests – in several high income countries as marginal farm land was taken out of production. Thus, in all likelihood there would be a substantial increase in global environmental quality following agricultural trade liberalization, even if no new environmental policies were introduced. Policy reforms in lower income countries which reduce the taxation of agriculture and improve forest management would add to these world-wide environmental gains.[69]

Interaction among environmental and trade policies

The situation in agriculture illustrates the general point that current restrictions on international trade can be bad for the environment. As regards future policies, there is concern

[69] Assuming high consumer prices for coal are maintained in high income countries, a similar environment-improving outcome is highly likely if global coal trade were to be liberalized (Anderson 1992a). An example from the manufactures area is discussed in Feenstra (1988). He shows how the voluntary export restraint agreement between the United States and Japan on automobiles led to an increase in the relative importance of heavier, less fuel efficient automobiles in the United States. See Birdsall and Wheeler (1991) for an analysis which concludes that openness to trade and foreign investment has been associated with less pollution intensity in Latin American countries.

that the growing interest in the linkages between trade and the environment brings with it a potentially serious source of new protectionism. More specifically, the past success of particular producer groups in manipulating domestic environmental policies to benefit themselves at the expense of both the rest of the economy and ultimately even the environment, and the successes of inefficient producers in obtaining protection against imports, suggests that the risks of inefficient policies being implemented in the area where environment and trade intersect are especially great.[70]

As was noted in Part 3, adoption of an environmental policy can cause direct pressure for additional protection, as the domestic industry may now claim that there is no longer a «level playing field». Alternatively, pressure may be exerted to amend existing unfair trade legislation to take into account asymmetric environmental regulatory regimes. In addition, firms may find that the impact of new environmental regulations on their profitability increases the likelihood that they can obtain protection under unfair trade laws or rules for emergency protection.[71] In the case of environmental, health and safety problems associated with consumption (rather than production), standards may be «strategically» manipulated by producer groups whose main aim is to put foreign rivals at a competitive disadvantage.[72]

The issue of political support for inappropriate policies becomes even more acute when protectionists attempt to draw environmental groups into implicit or explicit alliances. For example, a particular industry which is resigned to the inevitability of stricter environmental controls may try to avoid or resolve conflicts with environmental groups by indicating a willingness to clean-up, provided they are allowed to design the «fair» policy for doing so (there are elements of this in the proposals for countering so called «ecological dumping»). A similar process can be at work when the proposal is for tougher product standards. When this happens, it can substantially reduce the prospects of the appropriate environmental policy being adopted, since the policy which ranks first on efficiency grounds often ranks near the bottom of the industry's list of «fair» policy options.[73]

The dilemma for those concerned with the environment is that the political support of the affected industry for an economically costly environmental policy may increase the probability that at least some policy will be adopted. If this is the case, it may appear reasonable, in the short-term, for environmental groups to support the less appropriate environmental policy, despite the risk that their support of a higher cost policy will work against the environment in the medium and long term.

As has already been noted, non-discriminatory domestic policies offer the most efficient approach to dealing with nearly all environmental problems. Interference with trade is seldom, if ever, the first-best way of achieving a particular domestic environmental objective. If the efficient policy is believed not to be politically feasible, and the less efficient (protectionist oriented) policy is blocked by the GATT rules, the GATT rules can easily appear to be «environmentally unfriendly». But revising GATT rules to «legalize» inferior policies has serious drawbacks. Along with setting a bad precedent – the slippery slope argument – it would also remove an important incentive for countries to adopt appropriate domestic environmental policies.

[70] See, for example, Krueger (1974), Bhagwati (1982), Hillman (1989) and Magee, Brock and Young (1989) and the references cited there in. For an analysis of how the emergence of environmental lobbying groups can affect trade policy outcomes, see Hillman and Ursprung (1992). See also Van Grasstek (1991).

[71] See Hoekman and Leidy (1992). See also Finger and Murray (1990), Kaplan (1991) and Bovard (1991) on the point that the injury criteria established under existing legislation offer substantial discretion in evaluating the health of an industry.

[72] For a general discussion see Salop and Scheffman (1983).

[73] The history of the United States Clean Air Act provides a concrete example of the interaction between producers and environmental groups in the case of domestic environmental policies. See Ackerman and Hassler (1981), Maloney and McCormick (1982), Yandle (1989), Tietenberg (1988), Daly and Mayor (1986) and S. Fred Singer, «The Answer on Acid Rain Falls on Deaf Ears», *Wall Street Journal,* 6.3.90. Commenting on another example, involving the decision to build a major desalting plant in Arizona, Kneese (1988, pp. 7 and 13) notes that the option selected was most likely «about 15 to about 150 times» as costly as an available alternative, leading him to observe later in the paper that «there simply was no effective advocate for efficiency in the loop, and the result is a wildly uneconomic approach to the problem of reducing salinity in the Mexicali Valley.»

REFERENCES

Ackerman, D.A. and W.T. Hassler (1981), *Clean Coal Dirty Air*, New Haven: Yale University Press.

Anderson, K. (1992a), «Effects on the Environment and Welfare of Liberalizing World Trade: The Cases of Coal and Food», Ch. 8 in *The Greening of World Trade Issues*, edited by K. Anderson and R. Blackhurst, London: Harvester Wheatsheaf.

Anderson, K. (1992b), «Agricultural Trade Liberalization and the Environment: A Global Perspective», *The World Economy* 15(1), March (forthcoming).

Anderson, K. (1992c), «The Standard Welfare Economics of Policies Affecting Trade and the Environment», Ch. 2 in *The Greening of World Trade Issues*, edited by K. Anderson and R. Blackhurst, London: Harvester Wheatsheaf.

Anderson, K. and R. Blackhurst (1992), *The Greening of World Trade Issues.* London: Harvester Wheatsheaf and Ann Arbor: University of Michigan Press.

Anderson, K. and R. Tyers (1991), «More on Welfare Gains to Developing Countries from Liberalizing World Food Trade», mimeo, Australian National University, Canberra, July.

Avery, D.T. (1991), *Global Food Progress 1991*, Indianapolis: Hudson Institute.

Barbier, E.B. and J.C. Burgess (1991), «Agricultural Pricing and Environmental Degradation», background paper for the World Bank's *World Development Report 1991*, Washington, D.C.: The World Bank, June.

Baumol, W.J. and W.E. Oates (1979), *The Theory of Environmental Policy*, New York: Prentice Hall and Cambridge: Cambridge University Press (2nd edition).

Baumol, W.J. and W.E. Oates (1988), *The Theory of Environmental Policy*, Cambridge: Cambridge University Press (3rd edition).

Bernstam, M.S. (1991), *The Wealth of Nations and the Environment*, London: Institute of Economic Affairs.

Bhagwati, J.N. (1971), «The Generalized Theory of Distortions and Welfare», in *Trade, Balance of Payments and Growth*, edited by J.N. Bhagwati, *et. al.*, Amsterdam: North-Holland.

Bhagwati, J.N. (1982), «Directly Unproductive, Profit-Seeking (DUP) Activities», *Journal of Political Economy*, 90(5): 988-1002, October.

Bhagwati, J.N. (1991), *The World Trading System at Risk*, New York and London: Harvester Wheatsheaf.

Bhagwati, J.N. (1992), «Fair Trade, Reciprocity, and Harmonization: The Novel Challenge to the Theory and Policy of Free Trade», in *Analytical and Negotiating Issues in the Global Trading System*, Ann Arbor: University of Michigan Press, forthcoming.

Binswanger, H. (1991), «Brazilian Policies that Encourage Deforestation in the Amazon», *World Development* 19(7):821-30, July.

Birdsall, N. and D. Wheeler (1991), «Openness Reduces Industrial Pollution in Latin America: the Missing Pollution Haven Effect», paper presented to the World Bank Symposium on International Trade and the Environment, Washington, D.C., 21-22 November.

Blackhurst, R. and A. Subramanian (1992), «Promoting Multilateral Cooperation on the Environment», Ch. 12 in *The Greening of World Trade Issues*, edited by K. Anderson and R. Blackhurst, London: Harvester Wheatsheaf.

Bovard, J. (1991), *The Fair Trade Fraud*, New York: St. Martin's Press.

Cairncross, F. (1991), *Costing the Earth*, London: Business Books.

Charnovitz, S. (1991), «Exploring the Environmental Exceptions in GATT Article XX», *Journal of World Trade* 25(5): 37-56, October.

Chayes, A. and A.H. Chayes (1991), «Adjustment and Compliance Processes in International Regulatory Regimes», in *Preserving the Global Environment*, edited by J.T. Mathews, New York and London: W.W. Norton.

Chung, C. (1991), «Environmental Issues amd Policies in Newly Industrializing Open Economies», mimeo, Korea Development Institute, Seoul, June.

Cooper, R.N. (1989), «International Cooperation in Public Health as a Prologue to Macroeconomic Cooperation», pp. 178-254 in *Can Nations Agree? Issues in International Economic Cooperation*, edited by R.N. Cooper et al., Washington, D.C.: The Brookings Institution.

Corden, W.M. (1974), *Trade Policy and Economic Welfare*, Oxford: Clarendon Press.

Daly, G. and T. Mayor (1986), «Equity, Efficiency and Environmental Quality», *Public Choice* 51(2):141-59.

Dasgupta, P.S. and K-G. Mäler (1990), «The Environment and Emerging Development Issues», paper presented to the World Bank Annual Conference on Development Economics, Washington, D.C., 26-27 April.

Eckholm, E.P. (1976), *Losing Ground: Environmental Stress and World Food Prospects*, New York: W.W. Norton.

Enders, A. and A. Porges (1992), «Successful Conventions and Conventional Success: Saving the Ozone Layer», Ch. 7 in *The Greening of World Trade Issues*, edited by K. Anderson and R. Blackhurst, London: Harvester Wheatsheaf.

Fan, S.G. (1991), «Effects of Technological Change and Institutional Reform on Production Growth in Chinese Agriculture», *American Journal of Agricultural Economics*, 73(2):266-75, May.

Finger, J.M. and T. Murray (1990), «Policing Unfair Imports: The United States Example», *Journal of World Trade* 24(1):39-55, February.

GATT, *Basic Instruments and Selected Documents*, 29th, 34th, 35th, and 37th supplements.

Gladwin, T.N. and I. Walter (1976), «Multinational Enterprise, Social Responsiveness, and Pollution Control», *Journal of International Business Studies*, Fall.

Gray, H.P. and I. Walter (1985), «Investment Related Trade Distortions», *Journal of World Trade Law*, January.

Grossman, G.H. and A.B. Krueger (1991), «Environmental Impacts of a North American Free Trade Agreement», paper prepared for a conference on the U.S.-Mexico Free Trade Agreement, Princeton University, October.

Grut, M., J.A. Gray and N. Egli (1991), *Forest Pricing and Concession Policies: Managing the High Forests of West and Central Africa*, Technical Paper No.143, Africa Technical Department, Washington, D.C.: The World Bank.

Hahn, R.W. and K.R. Richards (1989), «The Internationalization of Environmental Regulation», *Harvard International Law Journal* 30(2):421-46, Spring.

Hillman, A.L. (1989), *The Political Economy of Protection*, London and New York: Harwood.

Hillman, A.L. and H. Ursprung (1992), «The Influence of Environmental Concerns on the Political Determination of Trade Policy», Ch.10 in *The Greening of World Trade Issues*, edited by K. Anderson and R. Blackhurst, London: Harvester Wheatsheaf.

Hoekman, B. and M. Leidy (1992), «Environmental Policy Formation in a Trading Economy: a Public Choice Perspective», Ch. 11 in *The Greening of World Trade Issues*, edited by K. Anderson and R. Blackhurst, London: Harvester Wheatsheaf.

Hufbauer, G.C. and J.J. Schott (1992), *North American Free Trade: Issues and Recommendations*, Washington, D.C.: Institute for International Economics.

Kaplan, S. (1991), «Injury and Causation in USITC Anti-Dumping Determinations: Five Recent Views», in *Policy Implications of Anti-Dumping Measures*, edited by M. Tharakan, Amsterdam: North-Holland.

Kneese, A.V. (1988), «Environmental Stress and Political Conflicts: Salinity in the Colorado River», Discussion Paper QE88-12, Resources for the Future, Washington, D.C.

Kozloff, K. and C.F. Runge (1991), «International Trade in the Food Sector and Environmental Quality, Health and Safety: A Survey of Policy Issues», Staff Paper P91-12, Department of Agricultural and Applied Economics, University of Minnesota, St. Paul, May.

Krueger, A. (1974), «The Political Economy of the Rent-Seeking Society», *American Economic Review*, 64(3):291-303, June.

Krueger, A.O., M. Schiff, and A. Valdes (1988), «Measuring the Impact of Sector-Specific and Economy-Wide Policies on Agricultural Incentives in LDCs», *World Bank Economic Review*, 2(3):255-72, September.

Lloyd, P. (1992), «The Problem of Optimal Environmental Policy Choice», Ch. 4 in *The Greening of World Trade Issues*, edited by K. Anderson and R. Blackhurst, London: Harvester Wheatsheaf.

Low, P. (1991), «Trade Measures and Environmental Quality: Implications for Mexico's Exports», paper presented to the World Bank Symposium on International Trade and the Environment, Washington, D.C., 21-22 November.

MacNeill, J., P. Winsemius and T. Yakushiji (1991), *Beyond Interdependence: The Meshing of the World's Economy and the Earth's Ecology*, New York: Oxford University Press.

Magee, S.P., W.A. Brock and L. Young (1989), *Black Hole Tariffs and Endogenous Policy Theory: Political Economy in General Equilibrium*, Cambridge: Cambridge University Press.

Maher, D.J. (1989), «Government Policies and Deforestation in Brazil's Amazon Region», Washington, D.C.: The World Bank.

Maloney, M.T. and R.E. McCormick (1982), «A Positive Theory of Environmental Quality Regulation», *Journal of Law and Economics* 25(1):99-123, April.

McDorman, T.L. (1991), «The GATT Consistency of U.S. Fish Import Embargoes to Stop Driftnet Fishing and Save Whales, Dolphins and Turtles», *George Washington Journal of International Law and Economics* 24(3):478-525.

McGuire, M. (1982), «Regulation, Factor Rewards and International Trade», *Journal of Public Economics* 17:335-54.

Mohr, E. (1990), «Burn the Forest! A Bargaining Theoretic Analysis of a Seemingly Perverse Proposal to Protect the Rainforest», Working Paper No. 447, Kiel Institute of World Economics, Kiel: January.

OECD (1989), *Renewable Natural Resources: Economic Incentives for Improved Management,* Paris: OECD.

OECD (1991), *Environmental Labelling in OECD Countries*, Paris: OECD.

Pearce, D. (ed.) (1991), *Blueprint 2: Greening the World Economy*, London: Earthscan Publications Ltd. in association with the London Environmental Economics Centre.

Pearce, D.W., E.B. Barbier, and A. Markandya (1989), *Sustainable Development: Environment and Economics in the Third World*, London: Edward Elgar.

Petersmann, E-U. (1991), «Trade Policy, Environmental Policy and the GATT: Why Trade Rules and Environmental Rules Should Be Mutually Consistent», *Aussenwirtschaft*, 46(2):197-221, July.

Phantumvanit, D. and T. Panayotou (1990), «Natural Resources for a Sustainable Future: Spreading the Benefits», paper presented to a conference on Industrializing Thailand and its Impact on the Environment, Thailand Development Research Institute, Bangkok, December.

Piggott, J., J. Whalley and R. Wigle (1992), «International Linkages and Carbon Reduction Initiatives», Ch. 6 in *The Greening of World Trade Issues*, edited by K. Anderson and R. Blackhurst, London: Harvester Wheatsheaf.

Porter, M. (1990), *The Competitive Advantage of Nations*, London: MacMillan.

Rauscher, M. (1992), «International Economic Integration and the Environment: the Case of Europe», Ch. 9 in *The Greening of World Trade Issues*, edited by K. Anderson and R. Blackhurst, London: Harvester Wheatsheaf.

Repetto, R. and M. Gillis (eds.)(1988), *Public Policies and the Misuse of Forest Resources*, Cambridge: Cambridge University Press.

RIVM and RIZA (Rijksinstituut voor Volksgezondheid en Milieuhygiene and Rijksinstituut voor Zuivering van Afvalwater), (1991) *Sustainable Use of Groundwater: Problems and Threats in the European Communities*, Report N° 600025001, Bilthoven, Netherlands.

Salop, S. and D. Scheffman (1983), «Raising Rivals' Costs», *American Economic Review* 73(1):267-71, March.

Sand, P. (1991), «International Cooperation: The Environmental Experience», in *Preserving the Global Environment*, edited by J.T. Mathews, New York and London: W.W. Norton.

Siebert, H. (1977), «Environmental Quality and the Gains from Trade», *Kyklos* 30(4):657-73.

Snape, R.H. (1992), «The Environment, International Trade and Competitiveness», Ch. 4 in *The Greening of World Trade Issues*, edited by K. Anderson and R. Blackhurst, London: Harvester Wheatsheaf.

Southgate, D., R. Sierra and L. Brown (1991), «The Causes of Tropical Deforestation in Ecuador: A Statistical Analysis», *World Development* (19)9:1145-1152, September.

Stern, R.M. (forthcoming), «Conflict and Cooperation in International Economic Relations», in *New Approaches to International Conflict*, edited by H. Jacobsen and W. Gimmerman, Ann Arbor: University of Michigan Press.

Thompson, D.N. (1973), *The Economics of Environmental Protection*, Cambridge: Winthrop.

Tietenberg, T.H. (1988), *Environmental and Natural Resource Economics*, Glenview, Illinois: Scott, Foresman (2nd edition).

Tobey, J.A. (1990), «The Effects of Domestic Environmental Policies on Patterns of World Trade: An Empirical Test», *Kyklos* 43(2):191-209.

Tucker, W. (1982), *Progress and Privilege: America in the Age of Environmentalism*, Garden City, New Jersey: Anchor Press/Doubleday.

Van Grasstek, C. (1991), «The Political Economy of Trade and the Environment in the United States Senate», paper presented to the World Bank Symposium on International Trade and the Environment, Washington, D.C., 21-22 November.

Walter, I. (1982), «Environmentally-Induced Industrial Relocation to Developing Countries», in *Environment and Trade*, edited by J. Rubin and T.R. Graham, London: Frances Pinter.

Walter, I. and J. Ugelow (1978), «Environmental Attitudes in Developing Countries», *Resources Policy* 4(3):200-209, September.

Weiner, M. (1990), *The Child and the State in India*, Princeton: Princeton University Press.

Winters, L.A. (1991), «Trade and Welfare Effects of Greenhouse Abatement: A Survey of Empirical Estimates», Ch. 5 in *The Greening of World Trade Issues*, edited by K. Anderson and R. Blackhurst, London: Harvester Wheatsheaf.

World Bank (1986), *World Development Report 1986*, Washington, D.C.: The World Bank.

Yandle, B. (1989), *The Political Limits of Environmental Regulation*, New York: Quorum Books.

APPENDIX I
MULTILATERAL ENVIRONMENTAL AGREEMENTS WITH TRADE PROVISIONS

This appendix details multilateral agreements in the environment (excluding cultural and military agreements) which have trade provisions as of mid-1991. The date next to the title of the agreement is the date at which it was signed.

I. Agreements in force

1. Convention Relative to the Preservation of Fauna and Flora in their Natural State, 1933

Objective is to preserve the natural fauna and flora of the world, particularly of Africa, by means of national parks and reserves, and by regulation of hunting and collection of species.

Trade provision: Prohibits the import and export of trophies unless the exporter is given a certificate permitting export. Parties shall take measures to control and regulate in each of its territories the internal import and export of trophies acquired in a manner not in accord with national law (Art. 9).

2. Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere, 1940

Objective is to preserve all species and genera of native American fauna and flora from extinction, and to preserve areas of extraordinary beauty, striking geological formation or aesthetic, historic or scientific value.

Trade provision: Provides for the regulation of trade in protected species by the issuance of export permits (Art. 9).

Note: Parties are countries in the Western Hemisphere.

3. International Convention for the Protection of Birds, 1950

Objective is to protect the populations of birds, and particularly migratory birds, from extinction.

Trade provision: Prohibits the import, export, transport, offer of sale or sale of any (i) live or dead birds killed or captured during the protected season (Art. 3); (ii) eggs, or their shells or their broods of young birds in the wild state during the breeding season (Art. 4).

Note: Parties are ten countries in Western Europe.

4. African Convention on the Conservation of Nature and Natural Resources, 1968

Objective is the conservation, utilisation and development of the soil, water, flora and faunal resources of the African continent.

Trade provision: For all species, a Party shall regulate trade in and the transport of specimens or trophies, and shall do so in such a manner as to prevent the illegal capture or killing of these. Trade in trophies and transport of specimens of protected species[1] shall be subject to a standard authorisation (i) additional to that required for the hunting, killing, capture or collection; (ii) which indicates the destination; (iii) which shall not be given unless they have been legally obtained; (iv) which shall be examined prior to exportation. Parties will make the import and transit of such specimens or trophies subject to the presentation of the authorisation required under (i) and confiscate illegally exported specimens or trophies (Art. IX).

Note: Parties are all members of the Organisation of African Unity.

5. Benelux Convention on the Hunting and Protection of Birds, 1970

Objective is to harmonise regulations on the hunting and protection of birds in the wild state.

[1] Species in Class A are completely protected; species in Class B are completely protected but may be hunted, killed, captured or collected under special authorization granted by the competent authority (Art. VIII).

Trade provision: In the case of traffic with third countries, (i) the export, import and transit of live or dead game shall be governed by the regulations in force in the partner countries in which such operations take place (Art. 6); (ii) the export, import, transit of all live or dead birds and of their eggs and young, shall be permitted only with prior authorisation from the partner countries in which such operations take place (Art. 9).

Note: Parties are Belgium, Luxembourg, and the Netherlands.

6. Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973

Objective is the protection of endangered species against overexploitation through international trade.

Trade provisions: Trade of species threatened with extinction (listed in Appendix I), and trade in species that may become endangered unless trade is strictly regulated (listed in Appendix II), is authorized by export and import permits approved by the Scientific Authorities of the Parties concerned (Articles III and IV). Species that a Party identifies as being subject to regulation within its own jurisdiction and as requiring international cooperation to control trade (listed in Appendix III) is subject to an export permit authorised by the Scientific Authority of the Party (Article V). Article XXIII permits a party to exempt itself from the requirements of the convention with regard to a specific species listed in Appendices I, II, or III.

Note: CITES builds on a long history of controlling trade in endangered species through the issue of export permits. It adds the twist of requiring an import permit for an export permit to be issued, in order to prevent circumvention to non-Parties.

7. Agreement on the Conservation of Polar Bears, 1973

Objective is to prohibit the capturing and killing of polar bears, and to protect the ecosystems of which the bears are a part.

Trade provision: Prohibits the exportation from or importation and delivery into, and traffic within, its territory of polar bears or any part or product thereof taken in violation of the agreement (Art. V).[2]

Note: Parties are Canada, Denmark, Norway, United States and USSR.

8. Convention for the Conservation and Management of the Vicuña, 1980

Objective is the conservation and management of the vicuña.

Trade provision: The export of fertile vicuña semen or other reproductive material is prohibited except to member countries for research and/or repopulation (Art. 4).

Note: Parties are four Latin American states.

9. Convention on Conservation of North Pacific Fur Seals, 1957

Objective is to achieve maximum sustainable productivity of the fur seal resources of the North Pacific Ocean.

Trade provision: The importation and delivery into and the traffic within the territory of a Party of skins taken in the area of the North Pacific Ocean is prohibited except those taken by the United States or USSR on rookeries, those taken for research purposes, or by native populations, confiscated or inadvertently captured (Art. VIII).

Note: Parties are Canada, Japan, United States and USSR.

10. Montreal Protocol on Substances That Deplete the Ozone Layer, 1987

Objective is to reduce and eliminate man-made emissions of ozone-depleting substances.

Trade provisions: Trade provisions affect non-Parties only. Parties are to ban the importation of controlled substances as of 1 January 1991, and ban the export of controlled substances as of 1 January 1993. Parties are also to ban the export of the relevant technology to non-Parties. The 1990 amendments, which are not in force, require Parties to ban the importation of CFC-containing products as of 1 January 1993.

11. European Convention for the Protection of Animals during International Transport, 1968

Objective is to safeguard, as far as possible, animals in transport from suffering.

Trade provision: Each Party shall apply the provisions governing the international transport of animals contained in the Convention (Art. I).

[2] Polar bears are listed in App. II of CITES which means that the export of bears, etc. must be limited to a level that is not detrimental to the species.

12. International Plant Protection Agreement, 1951

Objective is to maintain and increase international cooperation in controlling pests and diseases of pests and plant products, and prevent their introduction and spread across national boundaries.

Trade provision: Parties are required to regulate very strictly the import and export of plants and plant products, by means, where necessary, of prohibitions, inspections, and destruction of consignments (Art. 6).

13. Plant Protection Agreement for the South East Asia and Pacific Region, 1956

Objective is to prevent the introduction and spread of diseases, insect pests and other enemies of plants.

Trade provision: Each Party shall use its best endeavours to apply with respect to the importation of any plants from anywhere outside the region such measures of prohibition, certification, inspection, disinfection, disinfestation, quarantine, destruction or other measures as may be recommended by the Plant Protection Committee for the South East Asia and Pacific Region (Art. III).

Note: Arose out of the International Plant Protection Agreement.

14. Phyto-sanitary Convention for Africa, 1967

Objective is to prevent the introduction and spread of diseases, insect pests and other enemies of plants.

Trade provision: Each Party shall control the importation of plants, apply measures of prohibition, quarantine, certification or inspection for any plant, plant material, seed or packing material as the Organisation of African Unity shall consider necessary.

Notes: (i) Arose out of the International Plant Protection Agreement; (ii) supersedes the Phyto-Sanitary Convention for Africa South of the Sahara, 1954.

15. Agreement Concerning the Cooperation in the Quarantine of Plants and their Protection against Pests and Diseases, 1959

Trade provision: Parties undertake to apply uniform phytosanitary regulations for the import, export and transit of consignments of vegetable origin dispatched from one country to another (Art. 4).

Note: Parties are states in Central and Eastern Europe, and the USSR.

II. Agreements that are not in force[3]

16. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989

The objectives of the agreement are to limit the transboundary movement of hazardous waste among party countries, to set up notice and consent procedures, to define the scope of the agreement, and to define what constitutes illegal traffic and the responsibilities of the parties.

Trade provision: Categories of wastes are defined in Annex I, and characteristics of hazardous wastes in Annex III. In addition, a Party may define as or consider to be a hazardous waste other substances in its domestic legislation. Each Party may prohibit the import of hazardous wastes for disposal and shall inform other Parties; Parties shall not export hazardous wastes to a Party unless the State of import consents in writing, provided the State has not prohibited the import; Parties shall not allow the export of hazardous waste to a Party or prevent the importation of a hazardous waste if it has reason to believe that the waste will not be disposed of in an environmentally sound manner; trade with non-Parties is prohibited (Art. 4). A proposed transboundary movement of hazardous wastes or other wastes shall be notified by the State of export to the State of import, which must consent to the movement with or without conditions, and export will be allowed only if the disposal will be conducted in an environmentally sound manner (Art. 6), and re-import the material if this is not the case (Art. 8). Illegal traffic in hazardous wastes is also subject to the duty to re-import.

Notes: (i) The agreement leaves open a definition of hazardous waste; (ii) Resolution 3 recognizes the necessity of developing rules on liability and compensation for damage resulting from the transboundary movement and disposal of hazardous wastes and other wastes; (iii) only three parties have ratified the convention (20 are necessary for it to enter into force).

17. ASEAN Agreement on the Conservation of Nature and Natural Resources, 1985

To promote joint and individual state action for the conservation and management of the natural resources of the ASEAN region.

Trade provision: Parties are to regulate trade and the possession of species recognized as endangered by the parties.

[3] These agreements will enter into force when they have been ratified by a necessary group of countries.

APPENDIX II
TECHNICAL NOTES

This Appendix details the definitions, methods and sources used in *International Trade 1990-91*.

I. Composition of country groups

1. Regions

North America: United States of America, Canada and other territories in North America n.e.s.

Latin America: Argentina, Bahamas, Barbados, Bermuda, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Netherlands Antilles, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, Venezuela and other countries and territories in Latin America n.e.s.

Western Europe: Austria, Belgium, Denmark, Germany, Gibraltar, Finland, France, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, Yugoslavia, and other countries and territories in Western Europe n.e.s.

Central and Eastern Europe and the USSR: Bulgaria, Czech and Slovak Federal Republic, the former German Democratic Republic, Hungary, Poland, Romania and the USSR.

Africa: Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Côte d'Ivoire, Egypt, Equatorial Guinea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Kenya, Lesotho, Liberia, Libyan Arab Jamahiriya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Niger, Nigeria, Reunion, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Togo, Tunisia, Uganda, United Republic of Tanzania, Zaire, Zambia, Zimbabwe and other countries and territories in Africa n.e.s.

Middle East: Bahrain, Cyprus, Iraq, Islamic Republic of Iran, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, Yemen, and other countries and territories in the Middle East n.e.s.

Asia: Afghanistan, Australia, Bangladesh, Bhutan, Brunei Darussalam, China, Cambodia, Democratic People's Republic of Korea, Fiji, French Polynesia, Hong Kong, India, Indonesia, Japan, Kiribati, Lao People's Democratic Republic, Macau, Malaysia, Maldives, Mongolia, Nepal, New Caledonia, New Zealand, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Singapore, Solomon Islands, Sri Lanka, Taiwan, Thailand, Tonga, Tuvalu, Union of Myanmar, Vanuatu, Viet-Nam and other countries and territories in Asia and the Pacific n.e.s.

2. Major country groups

Developed countries: North America, Western Europe, Japan, Australia, New Zealand and South Africa.

Developing economies: Latin America, Africa (excluding South Africa), Middle East and Asia (excluding Japan, Australia, New Zealand, China and other centrally planned economies in Asia).

China and centrally planned economies in Asia: China, Democratic Peoples' Republic of Korea, Mongolia and Viet-Nam.

Central and Eastern Europe and the USSR: Bulgaria, Czech and Slovak Federal Republic, the former German Democratic Republic, Hungary, Poland, Romania and the USSR.

For the purposes of this Report and for reasons of convenience, Western Europe as a whole is included in the group of the developed countries even though certain countries in that region have not reached an advanced stage of economic development.

3. Other country groups

ASEAN: Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore and Thailand.

European Communities (EC): Belgium, Denmark, Germany, France, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain and the United Kingdom.

European Free Trade Association (EFTA): Austria, Finland, Iceland, Norway, Sweden and Switzerland.

Highly indebted countries: Argentina, Bolivia, Brazil, Chile, Colombia, Côte d'Ivoire, Ecuador, Mexico, Morocco, Nigeria, Peru, Philippines, Uruguay, Venezuela and Yugoslavia.

Least developed countries: Afghanistan, Bangladesh, Benin, Bhutan, Botswana, Burkina Faso, Burundi, Cape Verde, Central African Republic, Chad, Comoros, Djibouti, Equatorial Guinea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Haiti, Kiribati, Lao People's Democratic Republic, Lesotho, Malawi, Maldives, Mali, Mauritania, Mozambique, Nepal, Niger, Rwanda, Samoa, Sao Tome and Principe, Sierra Leone, Somalia, Sudan, Togo, Tuvalu, Uganda, Union of Myanmar, United Republic of Tanzania, Vanuatu and Yemen.

The designations used in this Report do not imply an expression of opinion by the Secretariat concerning either the status of any country, territory or area, or the delimitation of its frontiers.

II. Definitions and methods

For definitions of trade and product groups, as well as for description of methods applied, see Technical Notes in Volume II of this report.

III. Changes introduced in this Report

1. Eastern trading area

Following recent world events, the major country grouping «Eastern trading area», which combined all centrally planned economies, is no longer analytically useful. Beginning with this report, therefore, this country group is no longer used. Countries previously falling within this group have been regrouped under two headings, Central and Eastern Europe and the USSR, and China and other centrally planned economies in Asia. To the extent possible, the data reflect the new groups.

2. Revaluation of Central and Eastern European merchandise trade

Due to the lack of market-determined exchange rates, marked difficulties in converting national currencies into their dollar equivalents have been experienced with regard to countries in this region.

Beginning with this issue, the Secretariat has adopted the practice of converting domestic currency trade data into the dollar equivalent using official conversion factors. This has resulted in some breaks in the comparability of the trade values over time, with the most important one occurring between 1984 and 1985. Valuation problems are discussed in more detail in Box 1 in Part II of this Report.

3. Germany

Through the accession of the German Democratic Republic to the Federal Republic of Germany with effect from 3 October 1990, the two German states formed one sovereign state, referred to as from the date of unification as «Germany». As from unification, the Federal Republic of Germany has acted in the United Nations under the designation of «Germany», so that all references in the nomenclature to the Federal Republic of Germany have been changed to the official designation.

For reasons of statistical convenience, however, the data for Germany shown in this report refer to the former Federal Republic of Germany unless otherwise indicated. For the same reasons, data for the former German Democratic Republic are shown separately, and remain in the aggregate for Central and Eastern Europe and the USSR, unless otherwise indicated.

It should be noted that there are some inconsistencies in the treatment of Germany in the 1990 trade statistics of its trading partners. For most reporters to the UNSO Comtrade data base, trade with Germany in 1990 continued to be reported separately for the Federal Republic and the Democratic Republic. However, figures on exports to and imports from the Federal Republic include the Democratic Republic for the last two or three months of the year. Conversely trade figures for the German Democratic Republic refer to January-September (or October). Two notable exceptions are Austria and Hong Kong where reported annual data for the Federal Republic of Germany include the Democratic Republic. As a result, comparisons over time of the area or country groupings affected by German unification should be made with caution.

IV. Sources

Most frequently used sources for data are:

ADB, *Key Indicators of Developing Member Countries of ADB*
ECE, *Economic Survey of Europe*
Eurostat, *External Trade*
FAO, *Production Yearbook*
IEA, *Energy Statistics of OECD Countries*
FAO, *Trade Yearbook*
IMF, *Balance of Payments Yearbook*
IMF, *International Financial Statistics*
OECD, *Main Economic Indicators*
OECD, *Statistics of Foreign Trade*

OECD, *National Accounts*
UNSO, *Comtrade database*
UNSO, *International Trade Statistics Yearbook*
UNSO, *Monthly Bulletin of Statistics*

These sources are supplemented by national publications and Secretariat estimates.

GATT trade statistics are largely derived from two different sources. Figures for total merchandise trade are derived from IMF, *International Financial Statistics*. Data on trade by origin, destination and product come mainly from the UNSO Comtrade data base. Whereas the use of the two data sources has enabled the Secretariat to maximise the statistical coverage of world merchandise trade, some inconsistencies in data for the same country or territory between the two sources are inevitable. These can be attributed to the use of different systems of recording trade, to the way in which the IMF and the UNSO have converted data expressed in national currencies into dollars, and revisions which are more readily incorporated in the IMF data.

For trade of Latin America, supplementary sources include ECLAC, IMF and World Bank publications. Data on exports of LAIA countries are obtained from ECLAC, Statistical Yearbook for Latin America and the Caribbean. For trade in iron and steel, data from the sources listed above are supplemented by Iron and Steel Statistics Bureau, *World Trade Steel*.

Acknowledgments are due to the Economic Commission for Europe, the International Monetary Fund, the Organisation for Economic Co-operation and Development, the Organization of Petroleum Exporting Countries, the United Nations Statistical Office, UNCTAD, and the World Bank whose assistance in supplying advance copies of their publications as well as other information has greatly facilitated the work of the Secretariat.

Appendix Table 1

The USSR's foreign trade and output by republic, 1988

(Percentage share)

	Exports	Imports	Industrial output	Agricultural output
USSR	100.0	100.0	100.0	100.0
Russian SFSR	70.6	68.5	61.9	46.9
Ukraine	14.6	13.8	16.7	21.7
Belorussia	3.6	3.8	4.0	5.4
Uzbekistan	3.2	1.7	2.3	4.9
Kazakhstan	1.8	2.8	2.5	7.1
Lithuania	1.1	1.3	1.1	2.2
Azerbaijan	0.9	1.4	1.7	1.8
Georgia	0.8	1.3	1.4	1.5
Latvia	0.8	1.0	1.1	1.3
Tadzhikistan	0.7	0.5	0.5	1.1
Moldavia	0.5	1.1	1.0	2.2
Turkmenistan	0.5	0.4	0.4	1.2
Estonia	0.5	0.7	0.6	0.8
Armenia	0.2	0.9	1.2	0.6
Kirgizia	0.1	0.8	0.6	1.3

Note: Exports and imports are valued at internal prices.

Appendix Table 2

Major non-industrial trading partners of the USSR outside Europe, 1990

(Billion dollars)

Imports from		Exports to	
Cuba	6.3	Cuba	5.8
India	3.2	China	2.4
China	2.8	India	2.0
Syria	1.4	Viet Nam	1.9
Viet Nam	1.2	Mongolia	1.7
Korea, Dem. Rep.	1.0	Korea, Dem. Rep.	1.5
Iraq	0.9	Afghanistan	0.6
Mongolia	0.7	Egypt	0.6
Egypt	0.7	Iraq	0.5
Argentina	0.6	Korea, Rep.	0.3

Note: A large portion of the USSR's exports are not identified by destination. It is generally accepted that these exports are primarily destined for countries in Africa and the Middle East.

Appendix Table 3

Imports of the European Communities from Central and East European countries, 1990

(Percentage)

From:	Leading import items	Share in EC imports of the product		Annual change
		from the country	from extra-EC	
Bulgaria	Food	24	0.4	30
	Iron and steel	12	0.8	48
	Chemicals	11	0.2	14
	Clothing	10	0.3	70
Czech and Slovak Fed. Rep.	Iron and steel	13	3.8	26
	Chemicals	11	1.0	17
	Other semi-manufactures	13	0.3	39
Hungary	Food	23	1.7	10
	Clothing	12	1.7	40
	Chemicals	10	0.9	27
Poland	Food	21	2.7	43
	Ores, minerals and non-ferrous metals	10	2.2	33
	Fuels	10	0.7	29
	Clothing	10	2.5	77
Romania	Clothing	23	1.7	1
	Fuels	21	0.5	-53
	Other consumer goods	21	0.8	-4
Central and Eastern Europe	Food	17	5.4	22
	Clothing	11	6.8	38
	Other semi-manufactures	10	0.9	46

Notes: 1. «Leading import item» is defined as a product which accounts for at least 10 per cent of the total merchandise imports of the European Communities from the country.
2. Figures for Central and Eastern Europe exclude the former German Democratic Republic.

Appendix Table 4

Population, GDP, merchandise and commercial services trade by country, 1989

	Population	GDP	Merchandise		Commercial services	
			Exports	Imports	Exports	Imports
	(Millions)	(Million $)	(Million $)		(Million $)	
Afghanistan	16.2	...	236	822	1	96
Algeria	24.5	53100	10600	8500	...	...
Angola	9.7	6000	1350	635	...	...
Antigua and Barbuda	0.1	...	26	254	...	...
Argentina	31.9	59200	9579	4203	2086	2534
Australia	16.8	281700	37662	44933	8520	12609
Austria	7.6	126400	31905	38980	18099	10669
Bahamas	0.2	3000	2763	3101	1406	520
Bahrain	0.5	...	2831	3134	871	1055
Bangladesh	111.6	20200	1305	3648	268	594
Barbados	0.3	1700	186	673	725	259
Belgium-Luxembourg	10.3	161800	100012	98473	23632	22514
Belize	0.2	300	125	216	65	55
Benin	4.6	1700	90	320	...	...
Bermuda	0.1	...	32	508	...	...
Bolivia	7.1	4500	822	620	132	286
Botswana	1.2	1100	1446	1386	129	221
Brazil	147.3	479900	34383	20016	3075	5096
Brunei Darussalam	0.3	...	2160	566	...	...
Bulgaria	9.0	15600	16220	15180	...	...
Burkina Faso	8.8	2600	75	495	20	192
Burundi	5.3	1100	78	187	5	52
Cambodia	8.0	...	...	...	...	...
Cameroon	11.6	11600	1170	1300	...	...
Canada	26.3	547800	120245	119792	13818	19947
Cape Verde	0.4	300	7	112	38	16
Central African Rep.	3.0	1100	134	150	...	...
Chad	5.5	1000	155	450	28	206
Chile	13.0	25200	8191	6496	1481	2084
China	1105.1	413400	51626	58282	4452	3573
Colombia	32.3	39400	5717	5004	1301	1635
Comoros	0.5	200	18	85	8	21
Congo	2.2	2300	912	524	63	481
Costa Rica	2.7	5300	1415	1717	475	442
Côte d'Ivoire	11.7	9300	2655	2120	505	1141
Cuba	10.5	...	5815	7329	...	...
Cyprus	0.7	4500	791	2288	1523	535
Czech and Slovak Fed. Rep.	15.6	50500	14450	14260	2864	2089
Denmark	5.1	104100	28107	26690	9767	8476
Djibouti	0.4	...	15	294	...	...
Dominica	0.1	...	45	107	...	...
Dominican Rep.	7.0	6700	928	2280	1210	460
Ecuador	10.3	10400	2354	1855	489	686
Egypt	51.4	32500	2565	7434	4627	3732
El Salvador	5.1	5500	497	1152	...	...
Equatorial Guinea	0.3	100	41	...	6	25
Ethiopia	48.9	6000	465	951	200	164
Fiji	0.7	1200	423	581	335	197
Finland	5.0	115100	23298	24436	4126	6216
France	56.1	956900	179397	192986	65258	49604
French Guiana	0.1	...	57	571	...	...
French Polynesia	0.2	...	89	794	...	...
Gabon	1.1	3400	1622	770	266	870
Gambia	0.8	200	40	161	50	34
German Dem. Rep.	16.7	...	17330	17780	...	...
Germany	61.3	1189100	341231	269702	45430	70460

Appendix Table 4 (cont'd)

Population, GDP, merchandise and commercial services trade by country, 1989

	Population	GDP	Merchandise		Commercial services	
			Exports	Imports	Exports	Imports
	(Millions)	(Million $)	(Million $)		(Million $)	
Ghana	14.4	5100	1025	945	74	212
Greece	10.0	53400	7545	16151	4871	2344
Grenada	0.1	200	37	111	57	31
Guadeloupe	0.3	...	111	1246	...	...
Guatemala	8.9	8300	1126	1664	236	360
Guinea	5.5	2400	600	480	...	...
Guinea-Bissau	1.0	200	6	70	...	...
Guyana	0.8	300	227	236	...	...
Haiti	6.4	2500	165	291	77	143
Honduras	5.0	4900	912	981	111	204
Hong Kong	5.7	63000	73140	72155	12338	8010
Hungary	10.6	28600	9670	8865	...	...
Iceland	0.3	5200	1381	1401	376	481
India	832.5	265700	15846	20535	...	...
Indonesia	178.2	93900	22160	16444	1875	5291
Iran, Islamic Rep.	50.2	...	13500	10700	...	...
Iraq	18.3	...	14000	10300	...	...
Ireland	3.5	33900	20667	17420	2263	2933
Israel	4.5	46000	10738	14389	4371	4866
Italy	57.5	865800	140556	153011	37846	36157
Jamaica	2.4	3700	967	1801	934	691
Japan	123.0	2818900	273932	209715	39450	80570
Jordan	4.0	4500	1107	2125	1221	959
Kenya	23.3	8600	970	2148	699	500
Kiribati	0.1	...	6	23	...	...
Korea, Dem. Rep.	21.4	...	...	...	...	...
Korea, Rep.	42.4	211900	62331	61300	9913	9223
Kuwait	2.0	23500	9800	6295	1106	3628
Lao People's Dem. Rep.	4.1	...	...	150	...	...
Lebanon	2.7	...	610	2350	...	...
Lesotho	1.7	500	66	594	391	42
Liberia	2.5	...	410	323	...	...
Libyan Arab Jamahiriya	4.4	...	10000	5500	...	...
Macau	0.5	...	1640	1478	...	...
Madagascar	11.2	2500	319	386	108	169
Malawi	8.2	1600	267	503	...	...
Malaysia	17.3	37500	25053	22496	3085	5026
Maldives	0.2	...	45	105	90	45
Mali	8.2	2000	271	500	52	300
Malta	0.4	1900	844	1479	676	425
Martinique	0.3	...	200	1321	...	...
Mauritania	2.0	1000	437	222	22	188
Mauritius	1.1	2100	986	1325	398	345
Mexico	85.4	195100	35600	33900	9811	7803
Mongolia	2.1	...	...	...	...	...
Morocco	24.6	22900	3307	5492	1551	801
Mozambique	15.4	1200	101	680	...	...
Myanmar, Union of	40.8	...	215	201	...	...
Nepal	18.4	2900	158	580	159	143
Netherlands	14.8	223600	107843	104330	25400	24746
Netherlands Antilles	0.2	...	865	2470	...	...
New Caledonia	0.2	...	675	766	...	...
New Zealand	3.3	40800	8875	8784	2374	3561
Nicaragua	3.7	...	298	685	...	...
Niger	7.5	2000	320	335	51	139
Nigeria	113.7	29600	7871	4190	192	889

Appendix Table 4 (cont'd)

Population, GDP, merchandise and commercial services trade by country, 1989

	Population	GDP	Merchandise		Commercial services	
			Exports	Imports	Exports	Imports
	(Millions)	(Million $)	(Million $)		(Million $)	
Norway	4.2	90600	27062	23666	10541	10609
Oman	1.5	...	4045	2257	...	...
Pakistan	110.0	40400	4709	7143	772	1319
Panama	2.4	4600	297	986	819	276
Papua New Guinea	3.8	3600	1404	1530	148	390
Paraguay	4.2	4100	1006	741	320	489
Peru	21.1	28600	3489	2566	896	1269
Philippines	61.2	44300	7755	11171	3684	1540
Poland	38.1	66300	13540	10330	3201	3053
Portugal	10.3	45300	12799	19072	4018	2687
Qatar	0.4	...	2115	1326	...	...
Reunion	0.6	...	144	1674	...	...
Romania	23.1	...	10490	8435	...	...
Rwanda	6.9	2200	95	333	34	95
Samoa	0.2	...	12	67	26	14
Sao Tome and Principe	0.1	...	8	12	2	7
Saudi Arabia	14.4	78800	27741	21153	...	...
Senegal	7.2	4700	705	1150	341	355
Seychelles	0.1	300	34	165	172	96
Sierra Leone	4.0	900	138	183	...	...
Singapore	2.7	28400	44665	49667	10955	6514
Solomon Islands	0.3	200	75	114	19	54
Somalia	6.1	1300	82	150	...	122
South Africa	34.9	90400	22220	17883	2908	4651
Spain	39.2	375700	44492	71469	25061	12821
Sri Lanka	16.8	7100	1545	2188	323	500
St. Lucia	0.1	300	92	238	136	64
St. Vincent and the Grenadines	0.1	...	78	187	35	28
Sudan	24.4	16300	672	1000	163	347
Suriname	0.4	1300	285	245	19	77
Swaziland	0.8	600	443	581	153	87
Sweden	8.5	189400	51547	48975	11575	14936
Switzerland	6.5	175500	51525	58194	14753	13313
Syrian Arab Republic	12.1	...	2986	2084	551	538
Taiwan	19.9	146900	66195	52507	7472	13987
Thailand	55.2	66500	20078	25771	6325	4495
Togo	3.5	1300	245	452	106	185
Tonga	0.1	100	9	54	...	...
Trinidad and Tobago	1.3	4100	1578	1222	273	425
Tunisia	8.0	10100	2930	4374	1433	580
Turkey	54.9	79100	11627	15763	5740	2206
Uganda	16.8	4300	273	652	...	...
United Arab Emirates	1.5	27600	17000	10010	...	...
United Kingdom	57.3	832600	152344	197730	47838	37954
United States of America	248.2	5132000	363812	492922	102500	78010
Uruguay	3.1	8400	1594	1174	396	364
USSR	287.7	...	109120	114510	...	...
U.R. of Tanzania	25.6	2900	260	760	119	247
Vanuatu	0.2	100	18	68	...	...
Venezuela	19.2	43800	13144	7803	1082	1947
Viet Nam	65.6	...	1502	3056	...	...
Western Samoa	0.2	100	13	77	...	...
Yemen	11.3	...	...			
Yugoslavia	23.7	59100	13460	14829	5441	8245
Zaire	34.4	9600	1254	849	136	686
Zambia	7.8	5400	1334	928	...	...
Zimbabwe	9.6	6000	1680	1345	...	...
WORLD[a]	**5200**	...	**3080000**	**3177000**	**693000**	**677000**

[a] World estimates of commercial services cover all the countries which report trade in commercial services to the IMF.

Sources: World Bank (population and GDP data), IMF and GATT (merchandise trade and commercial services trade data).

Appendix Table 5
Selected economic indicators by country, 1989

	GDP per capita ($)	GDP[a] per capita at international 1989 prices ($)	Merchandise trade (X+M) ($ per capita)	Services trade (X+M) ($ per capita)	Merchandise trade ((X+M)/2), (as % of GDP)	Share in world merchandise trade
Afghanistan	2170	...	65	6	...	0.02
Algeria	2170	...	781	...	18	0.31
Angola	620	...	205	...	17	0.03
Antigua and Barbuda	...	...	3569	...	...	0.00
Argentina	1860	...	432	145	12	0.22
Australia	16810	14290	4927	1260	15	1.32
Austria	16630	13710	9329	3786	28	1.14
Bahamas	12230	...	23645	7766	97	0.09
Bahrain	...	...	12198	3939	...	0.10
Bangladesh	180	960	44	8	12	0.08
Barbados	6730	...	3373	3863	25	0.01
Belgium-Luxembourg	15760	13680	19337	4496	61	3.18
Belize	1740	...	1851	651	53	0.01
Benin	370	1040	89	...	12	0.01
Bermuda	...	...	9310	...	...	0.01
Bolivia	630	...	203	59	16	0.02
Botswana	920	3990	2327	288	127	0.05
Brazil	3260		369	55	6	0.87
Brunei Darussalam	...	...	10485	...	...	0.04
Bulgaria	1730	...	3489	...	50	0.50
Burkina Faso	290	...	65	24	11	0.01
Burundi	200	...	50	11	12	0.00
Cameroon	1010	2070	214	...	11	0.04
Canada	20830	19230	9126	1284	22	3.85
Cape Verde	770	...	322	146	21	0.00
Central African Rep.	370	...	96	...	13	0.00
Chad	180	...	109	42	30	0.01
Chile	1950	...	1132	275	29	0.24
China	370	...	99	7	13	1.76
Colombia	1220	...	332	91	14	0.17
Comoros	440	...	224	63	26	0.00
Congo	1030	2650	650	246	32	0.02
Costa Rica	1920	...	1145	335	30	0.05
Côte d'Ivoire	790	1700	408	141	26	0.08
Cuba	...	...	1252	...	...	0.21
Cyprus	6420	...	4437	2965	35	0.05
Czech and Slovak Fed. Rep.	3230	...	1836	317	14	0.46
Denmark	20290	14340	10678	3555	26	0.88
Djibouti	...	...	754	...	...	0.00
Dominica	...	...	1854	...	...	0.00
Dominican Rep.	950	...	458	239	24	0.05
Ecuador	1010	...	407	114	20	0.07
Egypt	630	3160	195	163	15	0.16
El Salvador	1080	...	321	...	15	0.03
Equatorial Guinea	420	...	119	90	14	0.00
Ethiopia	120	330	29	7	12	0.02
Fiji	1670	...	1351	716	40	0.02
Finland	23140	15230	9597	2079	21	0.76
France	17050	14480	6636	2047	19	5.97
French Guiana	...	...	6542	...	...	0.01
French Polynesia	...	...	4415	...	...	0.01
Gabon	3110	...	2165	1028	35	0.04
Gambia	250	...	237	99	48	0.00
German Dem. Rep.	...	...	2104	...	...	0.56
Germany	19390	15220	9960	1889	26	9.79

Appendix Table 5 (cont'd)
Selected economic indicators by country, 1989

	GDP per capita ($)	GDP[a] per capita at international 1989 prices ($)	Merchandise trade (X+M) ($ per capita)	Services trade (X+M) ($ per capita)	Merchandise trade ((X+M)/2), (as % of GDP)	Share in world merchandise trade
Ghana	350	...	137	20	19	0.03
Greece	5320	7090	2360	719	22	0.38
Grenada	1980	...	1569	933	40	0.00
Guadeloupe	...	...	3991	...	...	0.02
Guatemala	930	...	312	67	17	0.04
Guinea	430	...	195	...	23	0.02
Guinea-Bissau	180	...	79	...	22	0.00
Guyana	330	...	579	...	87	0.01
Haiti	400	...	72	35	9	0.01
Honduras	980	...	380	63	19	0.03
Hong Kong	10990	15660	25335	3548	115	2.33
Hungary	2700	6200	1751	...	32	0.30
Iceland	20510	...	11040	3401	27	0.04
India	320	980	44	...	7	0.58
Indonesia	530	...	217	40	21	0.62
Iran, Islamic Rep.	3200	4430	482	...	...	0.39
Iraq	...	...	1330	...	...	0.39
Ireland	1760	8540	10768	1469	57	0.61
Israel	10170	...	5553	2041	27	0.40
Italy	15050	13920	5102	1286	17	4.70
Jamaica	1550	...	1155	678	37	0.04
Japan	22910	15710	3931	975	9	7.75
Jordan	1110	...	800	539	36	0.05
Kenya	370	1070	134	52	18	0.05
Kiribati	...	...	420	...	...	0.00
Korea, Rep.	5000	6720	2917	452	29	1.98
Kuwait	11650	...	7968	2344	34	0.26
Lao People's Dem. Rep.	...	...	37	...	...	0.00
Lebanon	...	...	1096	...	...	0.05
Lesotho	260	...	383	251	72	0.01
Liberia	...	...	296	...	...	0.01
Libyan Arab Jamahiriya	...	...	3527	...	...	0.25
Macau	...	...	6868	...	...	0.05
Madagascar	230	700	63	25	14	0.01
Malawi	200	660	94	...	24	0.01
Malaysia	2160	...	2742	468	63	0.76
Maldives	...	...	718	646	...	0.00
Mali	240	520	94	43	19	0.01
Malta	5400	...	6618	3137	61	0.04
Martinique	...	...	4527	...	...	0.02
Mauritania	510	...	337	107	33	0.01
Mauritius	1930	6030	2176	700	56	0.04
Mexico	2280	...	813	206	18	0.21
Morocco	930	2590	358	96	19	0.14
Mozambique	80	...	51	...	34	0.01
Myanmar, Union of	...	...	10	...	...	0.01
Nepal	160	...	40	16	13	0.01
Netherlands	15080	13630	14309	3382	47	3.40
Netherlands Antilles	...	...	17461	...	...	0.05
New Caledonia	...	...	9006	...	...	0.02
New Zealand	12210	11780	5282	1775	22	0.28
Nicaragua	...	...	263	...	...	0.02
Niger	270	...	88	25	16	0.01
Nigeria	260	1290	106	10	20	0.19

Appendix Table 5 (cont'd)
Selected economic indicators by country, 1989

	GDP per capita ($)	GDP[a] per capita at international 1989 prices ($)	Merchandise trade (X+M) ($ per capita)	Services trade (X+M) ($ per capita)	Merchandise trade ((X+M)/2), (as % of GDP)	Share in world merchandise trade
Norway	21500	17280	12035	5018	28	0.81
Oman	...	...	4241	...	...	0.10
Pakistan	370	1700	108	19	15	0.19
Panama	1930	...	541	462	14	0.02
Papua New Guinea	950	...	770	141	41	0.05
Paraguay	990	...	420	194	21	0.03
Peru	1350	...	286	102	11	0.10
Philippines	720	2280	309	85	21	0.30
Poland	1740	4980	627	164	18	0.38
Portugal	4390	7700	3084	649	35	0.51
Qatar	...	...	7984	...	...	0.06
Reunion	...	...	3108	...	...	0.03
Romania	...	...	818	...	...	0.30
Rwanda	310	620	62	19	10	0.01
Samoa	...	...	497	252	...	0.00
Sao Tome and Principe	340	...	165	74	24	0.00
Saudi Arabia	5460	...	3387	...	31	0.78
Senegal	650	1340	257	97	20	0.03
Seychelles	4280	...	2914	3924	34	0.00
Sierra Leone	230	540	79	...	17	0.01
Singapore	10570	...	35146	6509	166	1.51
Solomon Islands	560	...	602	232	54	0.00
Somalia	210	...	38	20	9	0.00
South Africa	2590	...	1148	216	22	0.64
Spain	9590	...	2961	967	15	1.86
Sri Lanka	420	2160	222	49	26	0.06
St. Lucia	1810	...	2239	1357	62	0.01
St. Vincent and the Grenadines	...	...	2331	554	...	0.00
Sudan	670	...	68	21	5	0.03
Suriname	3050	...	1216	220	20	0.01
Swaziland	840	...	1346	315	80	0.02
Sweden	22320	15670	11847	3124	27	1.61
Switzerland	26830	....	16774	4291	31	1.76
Syrian Arab Republic	...	...	420	90	...	0.08
Taiwan	7370	...	5953	1076	40	1.90
Thailand	1210	4190	831	196	34	0.73
Togo	380	...	199	83	26	0.01
Tonga	1010	...	643	...	32	0.00
Trinidad and Tobago	3210	...	2220	554	35	0.04
Tunisia	1260	3720	914	252	36	0.12
Turkey	1440	4610	499	145	17	0.44
Uganda	250	...	55	...	11	0.01
United Arab Emirates	17880	...	17494	...	49	0.43
United Kingdom	14540	14070	6113	1498	21	5.61
United States of America	20690	20690	3451	727	8	13.73
Uruguay	2740	...	900	247	16	0.04
USSR	...	...	777	...	...	3.58
U.R. of Tanzania	110	490	40	14	18	0.02
Vanuatu	890	...	566	...	32	0.00
Venezuela	2280	...	1088	157	24	0.34
Viet Nam	...	...	70	...	...	0.07
Western Samoa	690	...	566	...	41	0.00
Yugoslavia	2490	5320	1193	577	24	0.45
Zaire	280	...	61	24	11	0.03
Zambia	690	900	289	...	21	0.04
Zimbabwe	630	1830	316	...	25	0.05

[a] World Bank estimates based on the 1985 results of the United Nations' International Comparison Program, Phase V.
Sources: World Bank (population and GDP data), IMF and GATT (merchandise trade and commercial services data).

Note to Appendix Tables 4 and 5

The accuracy of the data in Appendix Tables 4 and 5 varies considerably. While population and merchandise trade data are in general subject only to a small margin of error, those for GDP and trade in commercial services are in many cases only rough estimates, particularly for some of the lower income and centrally planned economies. Even for the higher income countries, comparisons of GDP measured at current domestic prices and exchange rates often can be misleading because of fluctuations in exchange rates. As well, GDP can be a poor indicator of purchasing power because the extent of non-market activities, and the prices for labour-intensive nontradable goods and services, vary considerably across countries. These are the principal reasons for the difference between the nominal dollar value of per capita GDP and its value estimated using purchasing power parities (or international dollars), shown in columns 1 and 2 of Appendix Table 5 (for additional details, see pp. 285-87 of the World Bank's *World Development Report 1991*).

In 1989, the per capita GDP of Japan and many West European countries exceeded that of the United States when measured at current prices and current exchange rates. However, the valuation of GDP at purchasing power parities yields an estimate of United States GDP that exceeds that of Japan and all European countries. For some countries, such as Japan and Sweden, nominal GDP exceeded GDP at purchasing power parities by more than 40 per cent.

Estimates by the World Bank for lower income countries indicate that GDP valued at purchasing power parities is between two and five times larger than GDP in nominal dollars. To the extent that nominal GDP at current prices and exchange rates has a downward bias for many developing countries, the trade to GDP ratio for these countries, shown in column 5 of Appendix Table 5, is overstated.

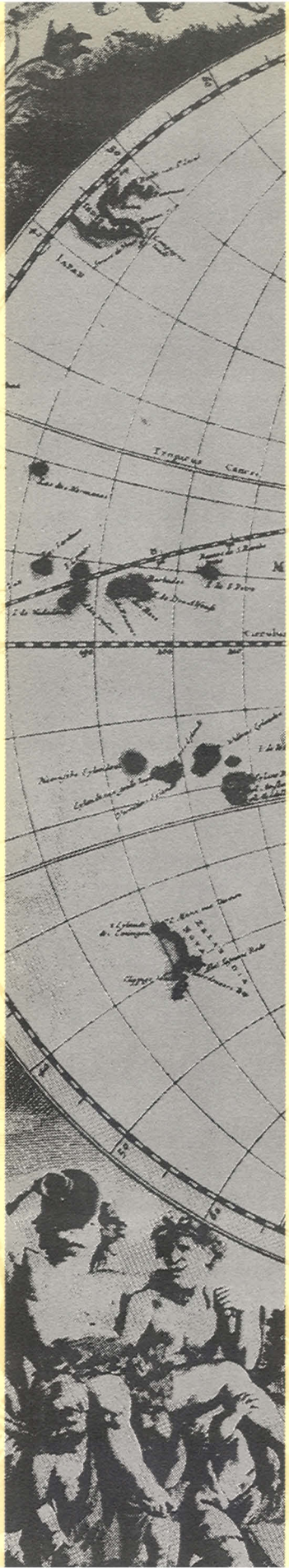
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